City of Rialto

Regular Meeting - Final

Planning Commission

Wednesday, November 24, 2021 | **6:00 PM** | **City Council Chambers,150 S. Palm Ave., Rialto, CA 92376**

Public Participation Procedures

NOTICE IS GIVEN THAT THE CITY COUNCIL OF THE CITY OF RIALTO HAS DECLARED A LOCAL EMERGENCY RELATED TO COVID-19, AND IN COMPLIANCE WITH SOCIAL DISTANCING PROTOCOLS REQUIRED BY GOVERNOR NEWSOM'S EXECUTIVE ORDER N-29-20 AND THE STATE DEPARTMENT OF PUBLIC HEALTH, THE COUNCIL CHAMBERS WILL BE OPEN TO THE PUBLIC WITH LIMITED SEATING INSIDE. THE PUBLIC WILL HAVE AN OPPORTUNITY TO SPEAK ON ANY ITEM USING THE PODIUM INSIDE THE COUNCIL CHAMBERS.

IF YOU ARE UNABLE TO ATTEND THE MEETING, YOU MAY SUBMIT COMMENTS ON ANY AGENDA ITEM AT LEAST TWO (2) HOURS BEFORE THE MEETING TIME, AS FOLLOWS:

- IN WRITING VIA MAIL TO: CITY OF RIALTO "ATTN: PLANNING COMMISSION, C/O COMMUNITY DEVELOPMENT," 150 S PALM AVE, RIALTO, CA 92376; OR
- BY EMAIL TO PLANNING@RIALTOCA.GOV.

Call To Order

Pledge of Allegiance

Roll Call

Chair Frank Gonzalez, Vice-Chair Jerry Gutierrez, Artist Gilbert, Dale Estvander, BarBara Chavez, Dale Estvander, John Peukert - One (1) Vacancy

Oral Communications from the Audience on items not on the Agenda

Planning Commission Minutes

PC-21-0840

Minutes from the October 16, 2021 Planning Commission meeting.

Attachments: PC MTG MINS 10-13-2021.docx

Public Hearings

PC-21-0893 ***Precise Plan of Design No. 2020-0011:*** A request to allow the development of a new concrete block manufacturing facility consisting of a 135,581 square foot manufacturing plant building, a 10,018 square foot administration building, a 21,360 square foot mechanic shop/storage building, a 21,534 square foot metal canopy structure, and associated paving, landscaping, lighting, fencing, and drainage improvements on 32.48 gross acres of land (APNs: 0260-061-41, -42, & -67) located at the terminus of Fortuna Way approximately 525 feet east of Industrial Drive within the Heavy Industrial (H-IND) land use district of the Agua Mansa Specific Plan. A Mitigated Negative Declaration (Environmental Assessment Review No. 2020-0008) has been prepared for consideration in conjunction with the project.

Attachments:
Exhibit A - Location Map
Exhibit B - Site Plan
Exhibit C - Exterior Elevations
Exhibit D - Preliminary Landscape Plan
Exhibit E - Initial Study
Exhibit F - Mitigation Monitoring & Reporting Program
Exhibit G - Traffic Impact Study
Exhibit H - HCP & USFWS Permit
Exhibit I - Draft Resolution for EAR No. 2020-0008
Exhibit J - Draft Resolution for PPD No. 2020-0011

Action Items

Planning Division Comments

COMMISSIONER REPORTS

Adjournment

City of Rialto

Legislation Text

File #: PC-21-0840, **Version:** 1, **Agenda #:**

Minutes from the October 16, 2021 Planning Commission meeting.

CITY OF RIALTO
THE REGULAR MEETING MINUTES OF PLANNING COMMISSION
October 13, 2021 - 6:00 p.m.

The Regular meeting of the Planning Commission of the City of Rialto was held in the City of Rialto City Council Chambers located at 150 South Palm Avenue, Rialto, California 92376, on Wednesday, October 13, 2021.

o0o

This meeting was called by the presiding officer of the City of Rialto Planning Commission in accordance with the provisions of **Government Code §54956** of the State of California.

o0o

CALL TO ORDER

Chair Frank Gonzalez called the meeting to order at 6:00 p.m.

o0o

PLEDGE OF ALLEGIANCE

Commissioner Dale Estvander led the pledge of allegiance.

o0o

ROLL CALL

Roll Call was taken by Senior Planner Daniel Casey.

Present:
Chair Frank Gonzalez
Vice-Chair Jerry Gutierrez
Commissioner John Peukert
Commissioner Dale Estvander
Commissioner Al Twine
Commissioner BarBara Chavez
Commissioner Artist Gilbert

Absent:

Staff Present:
City Attorney, Leila Moshref-Danesh
Senior Planner, Daniel Casey
Senior Planner, Dionne Harris
Associate Planner, Daniel Rosas
Administrative Assistant. Adrianna Martinez

ORAL COMMUNICATION

Chair Frank Gonzalez asked if there were any oral communications from the public not on the agenda. Adrianna Martinez stated there were none.

o0o

PLANNING COMMISSION MEETING MINUTES

Chair Gonzalez announced that the next item on the agenda is Planning Commission Meeting Minutes.

Motion by Commissioner Dale Estvander, second by Commissioner Artist Gilbert to move to approve the August 11, 2021, Planning Commission Special Meeting Minutes. All in favor, *motion carried* 7-0-0.

Motion by Commissioner Dale Estvander, second by Commissioner Al Twine to move to approve the August 25, 2021, Planning Commission Meeting Minutes. All in favor, *motion carried* 7-0-0.

PUBLIC HEARINGS

Chair Gonzalez stated the next item on the agenda is Conditional Development Permit No. 2021-0002.

Senior Planner Dionne Harris presented a request to allow the subdivision of approximately 4.74 acres of land (APNs: 0131-111-05, -07, -75 and -76) into 30 single-family lots and six lettered lots for private streets, common open space, landscaping, and stormwater retention located on the east side of Sycamore Avenue and Randall Avenue.

o0o

Chair Gonzalez opened the Public Hearing.

Rola Nicasio, Applicant

The Commission asked the applicant what the average square footage of the homes will be, as well as the price point. Rola Nicasio advised the homes will be between 2,0800 to 2,640 square feet and the price points have not been determined but will be below the FHA average of $470,000.

o0o

Motion by Vice Chair Jerry Gutierrez to close the Public Hearing, second by Commissioner Dale Estvander. All in favor, *motion carried* 7-0-0.

Motion by Vice Chair Jerry Gutierrez, second by Commissioner Dale Estvander to approve Conditional Development Permit No. 2021-0002. All in favor, *motion carried* 7-0-0.

o0o

Chair Gonzalez stated the next item on the agenda is Conditional Development Permit No. 2021-0028, Conditional Development Permit No. 2021-0027, and Precise Plan of Design No. 2021-0029.

Associate Planner Daniel Rosas presented a request to allow the development and operation of a 950 square foot coffee shop drive-thru service, as well as a 5,137 square foot automated carwash to be located at 127 West Valley Boulevard.

Lin Scott Law and Greenspan Engineers (LLG) prepared the Traffic Impact Analysis Scoping Agreement and determined 674 new daily vehicle trips will be generated with the proposed project but will not impact the intersections. LLG recommended restriping the number two lane to improve efficiency.

No comments were received during the public comment period.

The Commission asked how the drive-thru traffic will be managed. Daniel advised there is language in the resolution stating if the drive-thru traffic becomes an issue there are measures in place to address it.

o0o

Chair Gonzalez opened the Public Hearing.

Erwin Bucy, Paragon Community Group

Erwin Bucy stated Mister Car Wash is committed to using recycled water.

Scott Wineguard, Mister Car Wash

Scott Wineguard advised 61% of the water used by Mister Car Wash. The Commission asked how long one car wash cycle is and Scott Wineguard stated on average 3-7 minutes depending on which service the customer selects.

o0o

Motion by Commissioner Dale Estvander to close the Public Hearing, second by Commissioner Al Twine. All in favor, *motion carried* 7-0-0.

Motion by Commissioner Dale Estvander, second by Commissioner Artist Gilbert to approve Conditional Development Permit No. 2021-0027, Conditional Development Permit No. 2021-0028, and Precise Plan of Design No. 2021-0029. All in favor, *motion carried* 7-0-0.

o0o

Chair Gonzalez stated the next item on the agenda is Conditional Development Permit No. 2021-0009 through -0014, and Precise Plan of Design No. 2021-0013.

Senior Planner Daniel Casey presented a request to allow the development and operation of a passenger vehicle fuel station consisting of 7 fuel dispensers, truck fuel station with 9 fuel dispensers, the establishment of a 12,297 square foot convenience market within a proposed 14,697 square foot commercial building, the establishment of a 2,400 square foot restaurant with drive-thru service, development and operation of a 6,375 square foot truck service shop, the sale of beer and wine for off-site consumption, along with the associated site improvements located at the southwest corner of Alder Avenue and Sierra Lakes Parkway.

The Commission asked if the fair-share payment will provide full funding for the street improvements. Daniel Casey stated the Alder Avenue, and 210 project is actively moving forward, and the fair-share payment will contribute to it.

o0o

Chair Gonzalez opened the Public Hearing.

Brad Alsup, Applicant Representative

Brad Alsup addressed the Commission and stated Arby's is near finalizing their contract. He also advised the applicant is required to have infrastructure in place for EV charging and there is ample to convert as demand will increase.

The Commission asked what will be the repair capacity and Brad Alsup responded that only two trucks at a time will can be services for oil and tire changes, as well as adding fluids.

Vincent Piarulli, Property Owner at Casmalia Street and Sierra Lakes Parkway

Vincent Piarulli asked if there will be improvements to the streets Casmalia Street and Sierra Lakes Parkway. Daniel Casey advised the applicant is constructing and widening along the frontage.

o0o

Motion by Commissioner Dale Estvander to close the Public Hearing, second by Commissioner Al Twine. All in favor, *motion carried* 7-0-0.

Motion by Vice Chair Jerry Gutierrez, second by Commissioner Dale Estvander to approve Conditional Development Permit Nos. 2021-0009 through -0014, and Precise Plan of Design No. 2021-0013. All in favor, *motion carried* 7-0-0.

o0o

PLANNING DIVISION COMMENTS

Chair Gonzalez stated that the next item on the agenda is Planning Division Comments

Senior Planner Daniel Casey announced the next Planning Commission meeting is scheduled for October 27, 2021.

Daniel Casey also provided updates on miscellaneous items.

o0o

PLANNING COMMISSION COMMENTS

Chair Gonzalez stated that the next item on the agenda is Planning Commission Comments.

The Commission requested staff to add percentages to their traffic study presentations and directed staff to have the Rialto Police Department Traffic Sergeant attend a Planning Commission to discuss the street racing situation at the Target Warehouse site.

o0o

ADJOURNMENT

Motion by Commissioner Dale Estvander, second by Commissioner BarBara Chavez to adjourn the meeting. All were in favor, *motion carried 7-0-0.*

o0o

The Regular Planning Commission meeting on Wednesday, October 13, 2021, adjourned at 7:19 p.m.

____

Minutes prepared by Adrianna Martinez, Administrative Assistant

____

Frank Gonzalez, Chair Planning Commission

City of Rialto

Legislation Text

File #: PC-21-0893, **Version:** 1, **Agenda #:**

For the Planning Commission Meeting of November 24, 2021

TO: Honorable Chairman and Planning Commissioners

APPROVAL: Sean Moore, Community Development Director

FROM: Daniel Casey, Acting Community Development Manager

Precise Plan of Design No. 2020-0011: A request to allow the development of a new concrete block manufacturing facility consisting of a 135,581 square foot manufacturing plant building, a 10,018 square foot administration building, a 21,360 square foot mechanic shop/storage building, a 21,534 square foot metal canopy structure, and associated paving, landscaping, lighting, fencing, and drainage improvements on 32.48 gross acres of land (APNs: 0260-061-41, -42, & -67) located at the terminus of Fortuna Way approximately 525 feet east of Industrial Drive within the Heavy Industrial (H-IND) land use district of the Agua Mansa Specific Plan. A Mitigated Negative Declaration (Environmental Assessment Review No. 2020-0008) has been prepared for consideration in conjunction with the project.

APPLICANT:

Angelus Block Co., Inc., 3435 S. Riverside Avenue, Bloomington, CA 92316

LOCATION:

The project site consists of three (3) parcels of land (APNs: 0260-061-41, -42, & -67) located at the terminus of Fortuna Way approximately 525 feet east of Riverside Avenue (Refer to the attached Location Map (**Exhibit A**)).

BACKGROUND:

Surrounding General Plan Land Use Designations

Location	***General Plan Designation***
Site	General Industrial with a Specific Plan Overlay
North	General Industrial with a Specific Plan Overlay
East	General Industrial with a Specific Plan Overlay / City of Colton
South	General Industrial with a Specific Plan Overlay
West	General Industrial with a Specific Plan Overlay

Surrounding Zoning Designations

Location	*Zoning*
Site	Agua Mansa Specific Plan (Heavy Industrial (H-IND))
North	Agua Mansa Specific Plan (Heavy Industrial (H-IND))
East	Agua Mansa Specific Plan (Heavy Industrial (H-IND)) / City of Colton
South	Agua Mansa Specific Plan (Heavy Industrial (H-IND))
West	Agua Mansa Specific Plan (Heavy Industrial (H-IND))

Site Characteristics
The project site is a relatively flat, asymmetrical shaped piece of land comprised of three (3) parcels. Altogether, the project site is 32.48 gross acres in size with approximate dimensions of 2,000 feet (north-south) by 725 feet (east-west). The project site mostly consists of vacant land, however, approximately 10.5 acres of land on the south end of the project site currently contains an active recycling operation and outdoor storage of miscellaneous products, materials, and equipment from Angelus' various other facilities in the area.

Surrounding Area
The area surrounding the project site predominantly consists of lands developed with industrial uses and vacant lands designated for industrial uses. To the north of the project site is an 83.72-acre active construction debris landfill operated by Agua Mansa Properties, Inc., and to the east is the Agua Mansa Pioneer Cemetery and approximately 11.74 acres of vacant land. To the south of the project site is an 11.34-acre concrete paver manufacturing facility operated by Angelus Block Co, Inc., and to the west is an 11.07-acre cement product manufacturing facility operated by E-Z Mix, Inc. and approximately 30.5 acres of vacant land designated as a habitat conservation area.

ANALYSIS/DISCUSSION:

Project Proposal
Angelus Block Co., Inc., the applicant, proposes to construct and operate a new concrete block manufacturing facility on the project site. The facility will consist of a 135,581 square foot manufacturing plant building, a 10,018 square foot administration building, a 21,360 square foot mechanic shop/storage building, a 21,534 square foot metal canopy structure, and associated paving, landscaping, fencing, lighting, and drainage improvements. Primarily, the facility will produce a variety of concrete masonry blocks to be used in the construction of new walls and buildings throughout the region. In general, the concrete block manufacturing process will include raw material delivery, material mixing, product forming, curing, and finishing. Finished products are packaged, temporarily stored on-site, and then shipped to customers.

Entitlement Requirements
According to Table 8 (Permitted Uses) of the Agua Mansa Specific Plan, the development and operation of concrete product manufacturing facilities are permitted by right within the Heavy Industrial (H-IND) land use designation. As such, the following entitlements are required for the applicant's proposal:

- Precise Plan of Design: Per Section 18.65.010 of the Rialto Municipal Code, the design of the development and the related site improvements (e.g. building exterior, screen walls, landscaping, etc.) requires the approval of a Precise Plan of Design.

Site Design
According to the site plan (**Exhibit B**), the applicant will construct the 135,581 square foot manufacturing plant building in the center of the project site. Meanwhile, the 10,018 square foot administration building will be located approximately 300 feet south of the manufacturing plant building, and both the 21,360 square foot mechanic shop/storage building and the 21,534 metal canopy structure will be located approximately 320 feet from the manufacturing plant building on the east end of the project site. The proposed site layout includes a passenger vehicle parking area on the west side of the administration building and designated outdoor storage areas for raw material and finished product around the perimeter of the manufacturing plant building and on the south end of the site.

Two (2) new twenty-six (26) foot wide driveways connected directly to a cul-de-sac at the end of Fortuna Way on the west end of the site will provide full access for both trucks and passenger vehicles, and a third thirty-three (33) foot wide existing driveway connected directly to a cul-de-sac at the end of Singleton Drive on the south end of the site will provide full access for trucks only.

Other proposed on-site improvements include paving in the form of interlocking concrete pavers, lighting, landscape planters, concrete screen walls, and wrought-iron perimeter fencing.

Architectural Design
The proposed administration building will feature significant vertical and horizontal wall plane articulation on the west side of the building in the form of a projected mass, recessed windows, and roofline height variations. As shown on the elevations (**Exhibit C**), the building height ranges from 14 feet to 37 feet from the finished floor level. The exterior of the building will consist of split-face block, burnished block, and precision block with a “natural gray” finish. Other architectural features of the building include a painted steel portico with a mono-slope roof, dark gray block accent bands, metal brow accents, and glazing.

The exteriors of the proposed manufacturing plant building, mechanic shop building, and canopy structure will all consist of painted corrugated metal panels. The structures will also feature an eight (8) foot high split-face block wainscot around the base of each structure. The manufacturing plant building will have a maximum height of 56.5 feet from the finished grade, the mechanic shop building will have a maximum height of 31 feet from the finished grade, and the canopy structure will have a maximum height of 29 feet from the finished grade.

Parking
The development will have 69 auto-parking spaces, including five (5) ADA accessible parking spaces. This quantity equals the minimum parking requirement as shown in the parking calculation chart below and as required by Table 13 (Off-Street Parking Requirements) of the Agua Mansa Specific Plan, which requires one (1) parking space for every 300 square feet of office space gross floor area, one (1) parking space for every 1,000 square feet of warehouse space gross floor area up to 10,000 square feet, one (1) parking space for every 2,000 square feet of warehouse space gross floor area beyond 10,000 square feet, and one (1) parking space for each employee on the largest shift for manufacturing uses:

Type of Use	***Floor Area (square feet)***	***Parking Ratio***	***Number of spaces required***
Office Storage Floor area up to 10,000 square feet Floor area 10,001 square feet or more Manufacturing	10,018 10,000 4,160 N/A	1 / 300 1 / 1,000 1 / 2,000 1 Per Employee on Largest Shift	34 10 3 22
Total Required/Total Provided			**69/69**

Landscaping
The project will include a twenty-five (25) foot landscape setback along the entire frontage of Fortuna Way, as well as landscape planters around the perimeter of the building and throughout the passenger vehicle parking area. The landscape coverage for the proposed passenger vehicle parking area is 10.6 percent, which exceeds the minimum required amount of 10.0 percent. All the landscape planters will feature a variety of trees spaced every thirty (30) linear feet and an abundant number of shrubs and groundcover (**Exhibit D**).

GENERAL PLAN CONSISTENCY:

The General Plan land use designation of the site is General Industrial with a Specific Plan Overlay. According to Chapter 2 (Managing Our Land Supply) of the Rialto General Plan, manufacturing and processing uses, such as the project, are consistent with the General Industrial designation. Furthermore, the project is consistent with the following goals of the Land Use Element and Economic Development Element of the Rialto General Plan:

Goal 2-22: Promote commercial and/or industrial development that is well designed, people-oriented, environmentally sustainable, sensitive to the needs of the visitor or resident, and functionally efficient for its purpose.

Goal 3-1: Strengthen and diversify the economic base and employment opportunities, and maintain a positive business climate.

ENVIRONMENTAL IMPACT:

California Environmental Quality Act
The applicant engaged NV5, Inc. to prepare an Initial Study (Environmental Assessment Review No. 2020-0008) for the project in accordance with the requirements of the California Environmental Quality Act (CEQA). The Initial Study is attached to the agenda report (**Exhibit E**). Based on the findings and recommended mitigation within the Initial Study, staff determined that the project will not have an adverse impact on the environment and prepared a Mitigated Negative Declaration. Although the Mitigated Negative Declaration identified potential impacts related to biological resources, cultural resources, and transportation/traffic, any of these impacts will be reduced to a level of insignificance subject to the imposition of the recommended mitigation contained within the project's Mitigation Monitoring and Reporting Program (**Exhibit F**).

The Planning Division published a Notice of Intent to adopt the Mitigated Negative Declaration for the project in the San Bernardino Sun newspaper, mailed copies to all property owners within 300 feet of the project site. A twenty (20) day public comment period for the Mitigated Negative Declaration began on October 25, 2021 and ended on November 13, 2021. No comment letters were received during the public comment period.

Traffic
NV5, Inc. prepared a Traffic Impact Study (TIS), dated September 6, 2021, to assess the project's potential impacts to local streets and intersections (**Exhibit G**). The TIS estimates that the project will generate up to approximately 758 actual daily vehicle trips (1,270 PCE daily vehicle trips) with 117 trips in the AM peak hour and 127 trips in the PM peak hour. Trucks will constitute up to 303 of the 758 actual daily vehicle trips.

The TIA analyzed twelve (12) intersections in the project vicinity, listed below:

- Riverside Avenue and Santa Ana Avenue (Signalized)
- Riverside Avenue and Slover Avenue (Signalized)
- Riverside Avenue and I-10 Eastbound Ramps (Signalized)
- Riverside Avenue and I-10 Westbound Ramps (Signalized)
- Riverside Avenue and Valley Boulevard (Signalized)
- Riverside Avenue and Jurupa Avenue (Signalized)
- Riverside Avenue and Industrial Drive (Unsignalized)
- Riverside Avenue and Resource Drive (Signalized)
- Riverside Avenue and Singleton Drive (Unsignalized)
- Riverside Avenue and Agua Mansa Road (Signalized)
- Industrial Drive and Fortuna Way (Unsignalized)
- Resource Drive and Enterprise Drive (Unsignalized)

Study intersection historical counts were collected in 2018 & 2019 due to the ongoing COVID-19 pandemic in conjunction with a 2% growth rate (compounded annually) to reflect 2021 conditions.

The TIS identified that the project will contribute to cumulative impacts to the following three (3) intersections:

- Riverside Avenue and I-10 EB Ramps
- Riverside Avenue and Slover Avenue
- Riverside Avenue and Santa Ana Avenue

The three (3) intersection impacts are considered significant based on City policy, and these impacts require the payment of a fair-share towards mitigation. The resulting fair-share cost based upon the project's trip generation is $724,398. The fair share payment will be allocated to mitigate impacts and paid towards construction as the improvements become fully funded.

The Transportation Commission reviewed and approved the TIS on October 6, 2021. In its decision, the Transportation Commission agreed with the findings within the TIS and the recommended "fair-share" mitigation.

Native American Tribal Consultation (Assembly Bill 52 and Senate Bill 18)
In accordance with California Assembly Bill 52, the Planning Division mailed notices to six (6) Native American tribes informing them of the project and allowing them to request consultation on the project. The Planning Division provided each tribe thirty (30) days, from June 4, 2020 to July 3, 2020, to request consultation on the proposed project. One (1) tribe, The Gabrieleño Band of Mission Indians-Kizh Nation (Kizh Nation), requested formal consultation during the period. Planning staff conducted formal consultation with Chairman Andrew Teutimez-Salas and Matt Teutimez of the Kizh Nation on March 31, 2021. The topics discussed included a basic background of the project and the anticipated construction activities. During the consultation, Chairman Teutimez-Salas requested the ability to allow a certified Native American Monitor on-site during all ground disturbance activities. The Draft Resolution of Approval includes a Condition of Approval requiring the applicant to coordinate with the Kizh Nation to allow access to the project site during all ground disturbance activities.

Delhi Sands Flower-Loving Fly
According to Exhibit 4.4.2 of the Rialto General Plan Environmental Impact Report, the project site lies within potential Delhi Sands Flower-Loving Fly (DSF) habitat. In the late 1990's several biological surveys were performed for the project site and the adjacent areas. The surveys identified that the project site and the adjacent areas contain suitable habitat for the DSF. In response, a Habitat Conservation Plan was established whereby 30.5 acres of land to the west of the project site was set aside as "Conservation Area" in order to facilitate future development of the remaining lands identified within the biological surveys and the Habitat Conservation Plan, including the project site. On August 27, 1999, the United States Fish and Wildlife Service issued a Federal Fish and Wildlife Permit to the applicant permitting future development of the project site. The applicant's Federal Fish and Wildlife Permit is valid until August 27, 2029. The Habitat Conservation Plan and the Federal Fish and Wildlife Permit are attached as **Exhibit H**.

PUBLIC NOTICE:

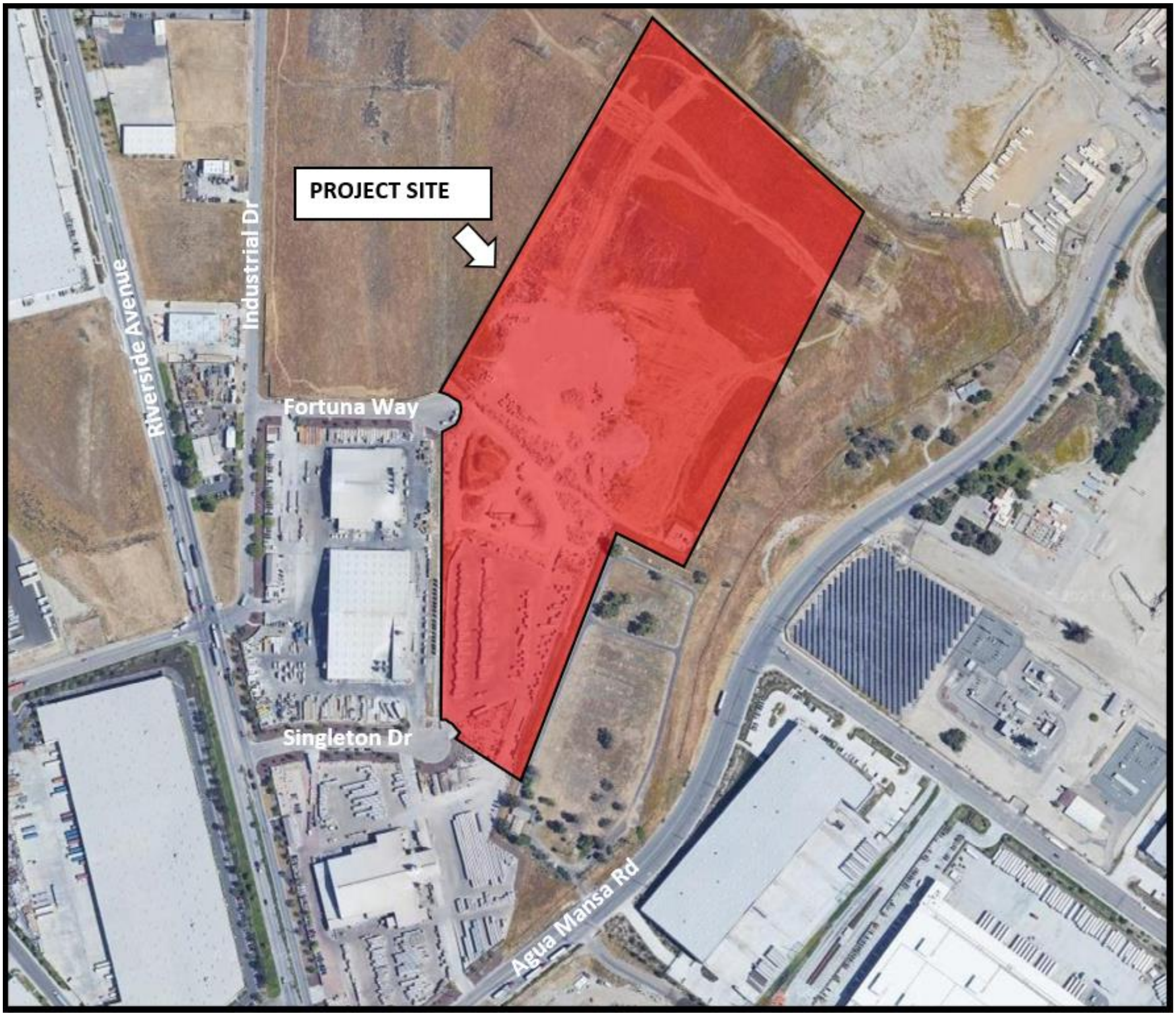
The City published a public hearing notice for proposed project in the *San Bernardino Sun* newspaper, posted copies of the public hearing notice outside the Council Chambers, and mailed public hearing notices to all property owners within 300 feet of the project site, as required by State law.

RECOMMENDATION:

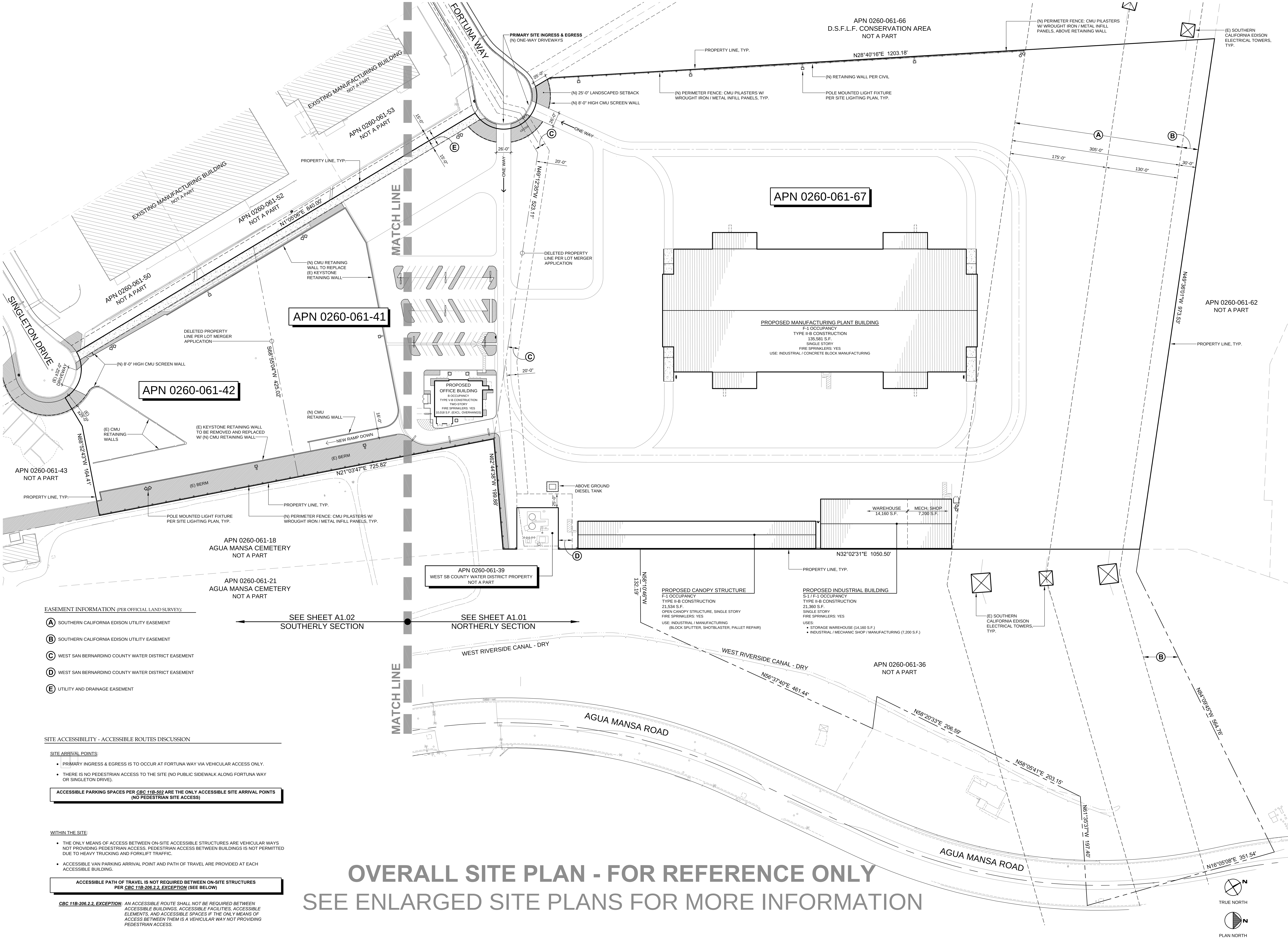
The Planning Division recommends that the Planning Commission:

- Adopt the attached Resolution (**Exhibit I**) to approve the Mitigated Negative Declaration for the proposed project and authorize staff to file a Notice of Determination with the Clerk of the Board of San Bernardino County; and

- Adopt the attached Resolution (**Exhibit J**) to approve Precise Plan of Design No. 2020-0011 to allow the development of a new concrete block manufacturing facility consisting of a 135,581 square foot manufacturing plant building, a 10,018 square foot administration building, a 21,360 square foot mechanic shop/storage building, a 21,534 square foot metal canopy structure, and associated paving, landscaping, lighting, fencing, and drainage improvements on 32.48 gross acres of land (APNs: 0260-061-41, -42, & -67) located at the terminus of Fortuna Way approximately 525 feet east of Industrial Drive, subject to the findings and conditions therein.



Project Location Map



EASEMENT INFORMATION (PER OFFICIAL LAND SURVEY):

- (A) SOUTHERN CALIFORNIA EDISON UTILITY EASEMENT
- (B) SOUTHERN CALIFORNIA EDISON UTILITY EASEMENT
- (C) WEST SAN BERNARDINO COUNTY WATER DISTRICT EASEMENT
- (D) WEST SAN BERNARDINO COUNTY WATER DISTRICT EASEMENT
- (E) UTILITY AND DRAINAGE EASEMENT

SITE ACCESSIBILITY - ACCESSIBLE ROUTES DISCUSSION

SITE ARRIVAL POINTS:

- PRIMARY INGRESS & EGRESS IS TO OCCUR AT FORTUNA WAY VIA VEHICULAR ACCESS ONLY.
- THERE IS NO PEDESTRIAN ACCESS TO THE SITE (NO PUBLIC SIDEWALK ALONG FORTUNA WAY OR SINGLETON DRIVE).

ACCESSIBLE PARKING SPACES PER *CBC 11B-502* ARE THE ONLY ACCESSIBLE SITE ARRIVAL POINTS (NO PEDESTRIAN SITE ACCESS)

WITHIN THE SITE:

- THE ONLY MEANS OF ACCESS BETWEEN ON-SITE ACCESSIBLE STRUCTURES ARE VEHICULAR WAYS NOT PROVIDING PEDESTRIAN ACCESS. PEDESTRIAN ACCESS BETWEEN BUILDINGS IS NOT PERMITTED DUE TO HEAVY TRUCKING AND FORKLIFT TRAFFIC.
- ACCESSIBLE VAN PARKING ARRIVAL POINT AND PATH OF TRAVEL ARE PROVIDED AT EACH ACCESSIBLE BUILDING.

ACCESSIBLE PATH OF TRAVEL IS NOT REQUIRED BETWEEN ON-SITE STRUCTURES PER *CBC 11B-206.2.2, EXCEPTION* (SEE BELOW)

CBC 11B-206.2.2, EXCEPTION: *AN ACCESSIBLE ROUTE SHALL NOT BE REQUIRED BETWEEN ACCESSIBLE BUILDINGS, ACCESSIBLE FACILITIES, ACCESSIBLE ELEMENTS, AND ACCESSIBLE SPACES IF THE ONLY MEANS OF ACCESS BETWEEN THEM IS A VEHICULAR WAY NOT PROVIDING PEDESTRIAN ACCESS.*

OVERALL SITE PLAN - FOR REFERENCE ONLY

SEE ENLARGED SITE PLANS FOR MORE INFORMATION

ANGELUS BLOCK CO., INC.
PROPOSED MANUFACTURING FACILITY
APN'S: 0260-061-67-0000, 0260-061-41-0000, 0260-061-42-0000
RIALTO, CA 92316

Mark	Revisions	Date

LICENSED ARCHITECT
FRANK J. LONI
C-35616
REN. 7/31/2021
STATE OF CALIFORNIA

LONI architects
LONI, INC.
architecture + engineering
1050 Lakes Dr. #225 | West Covina, CA 91790
T: 626.588.1977
E: admin@loniarchitects.com
www.loniarchitects.com

Sheet	Drawn By	Permit No.
A1.00	F. LONI	
	Signed 2/10/2021	Permit Date

Job Number 19-050

OVERALL REFERENCE SITE PLAN — 1" = 60'-0" — 1

PARKING (PER CHAPTER 18.58.030):

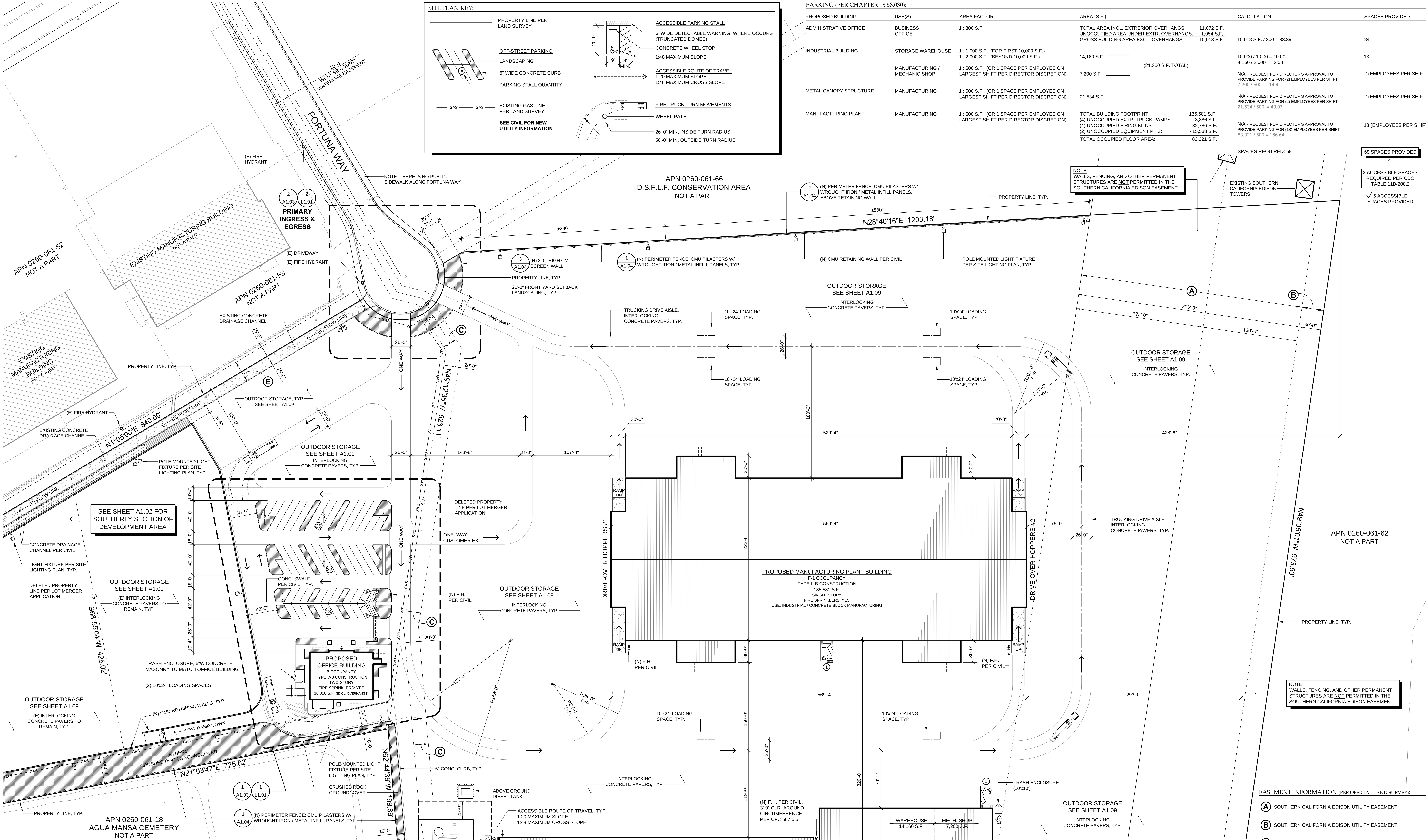
PROPOSED BUILDING	USE(S)	AREA FACTOR	AREA (S.F.)	CALCULATION	SPACES PROVIDED
ADMINISTRATIVE OFFICE	BUSINESS OFFICE	1 : 300 S.F.	TOTAL AREA INCL. EXTRERIOR OVERHANGS: 11,072 S.F. UNOCCUPIED AREA UNDER EXTR. OVERHANGS: -1,054 S.F. GROSS BUILDING AREA EXCL. OVERHANGS: 10,018 S.F.	10,018 S.F. / 300 = 33.39	34
INDUSTRIAL BUILDING	STORAGE WAREHOUSE	1 : 1,000 S.F. (FOR FIRST 10,000 S.F.) 1 : 2,000 S.F. (BEYOND 10,000 S.F.)	14,160 S.F. (21,360 S.F. TOTAL)	10,000 / 1,000 = 10.00 4,160 / 2,000 = 2.08	13
	MANUFACTURING / MECHANIC SHOP	1 : 500 S.F. (OR 1 SPACE PER EMPLOYEE ON LARGEST SHIFT PER DIRECTOR DISCRETION)	7,200 S.F.	N/A - REQUEST FOR DIRECTOR'S APPROVAL TO PROVIDE PARKING FOR (2) EMPLOYEES PER SHIFT 7,200 / 500 = 14.4	2 (EMPLOYEES PER SHIFT)
METAL CANOPY STRUCTURE	MANUFACTURING	1 : 500 S.F. (OR 1 SPACE PER EMPLOYEE ON LARGEST SHIFT PER DIRECTOR DISCRETION)	21,534 S.F.	N/A - REQUEST FOR DIRECTOR'S APPROVAL TO PROVIDE PARKING FOR (2) EMPLOYEES PER SHIFT 21,534 / 500 = 43.07	2 (EMPLOYEES PER SHIFT)
MANUFACTURING PLANT	MANUFACTURING	1 : 500 S.F. (OR 1 SPACE PER EMPLOYEE ON LARGEST SHIFT PER DIRECTOR DISCRETION)	TOTAL BUILDING FOOTPRINT: 135,581 S.F. (4) UNOCCUPIED EXTR. TRUCK RAMPS: - 3,886 S.F. (4) UNOCCUPIED FIRING KILNS: - 32,786 S.F. (2) UNOCCUPIED EQUIPMENT PITS: - 15,588 S.F. TOTAL OCCUPIED FLOOR AREA: 83,321 S.F.	N/A - REQUEST FOR DIRECTOR'S APPROVAL TO PROVIDE PARKING FOR (18) EMPLOYEES PER SHIFT 83,321 / 500 = 166.64	18 (EMPLOYEES PER SHIFT)

SPACES REQUIRED: 68

69 SPACES PROVIDED

3 ACCESSIBLE SPACES REQUIRED PER CBC TABLE 11B-208.2

✓ 5 ACCESSIBLE SPACES PROVIDED



FIRE DEPARTMENT NOTES:

1. FIRE SPRINKLERS ARE TO BE INSTALLED WITHIN ALL PROPOSED BUILDINGS AS REQUIRED BY THE CITY OF RIALTO FIRE DEPARTMENT.
2. ALL FIRE APPARATUS ROADS SHALL BE A MINIMUM OF TWENTY-SIX FEET WIDE AND SHALL REMAIN CLEAR AT ALL TIMES.

DEVELOPMENT IMPACT FEES:

1. DEVELOPMENT IMPACT FEES ARE REQUIRED TO BE PAID PRIOR TO THE ISSUANCE OF ANY BUILDING PERMITS.

PROPOSED BUILDING DATA TABULATION:

PROPOSED BUILDING	OCCUPANCY GROUP (CBC)	CONSTRUCTION TYPE (CBC)	USE	BUILDING AREA (S.F.)	MAXIMUM HEIGHT
1. ADMINISTRATIVE OFFICE	B - BUSINESS OFFICE	V-B	BUSINESS OFFICE	10,018 S.F. (EXCL. OVERHANGS)	+38'-0"
2. MANUFACTURING PLANT	F-1 - FACTORY INDUSTRIAL	II-B	INDUSTRIAL / MANUFACTURING	135,581 S.F.	+57'-0"
3. INDUSTRIAL BUILDING	S-1 - STORAGE WAREHOUSE / F-1 - FACTORY INDUSTRIAL	II-B	WAREHOUSE / MECHANIC SHOP	21,360 S.F.	+31'-0"
4. METAL CANOPY STRUCTURE	F-1 - FACTORY INDUSTRIAL	II-B	INDUSTRIAL / MANUFACTURING	21,534 S.F.	+29'-6"

EASEMENT INFORMATION (PER OFFICIAL LAND SURVEY):

- (A) SOUTHERN CALIFORNIA EDISON UTILITY EASEMENT
- (B) SOUTHERN CALIFORNIA EDISON UTILITY EASEMENT
- (C) WEST SAN BERNARDINO COUNTY WATER DISTRICT EASEMENT
- (D) WEST SAN BERNARDINO COUNTY WATER DISTRICT EASEMENT
- (E) UTILITY AND DRAINAGE EASEMENT

ANGELUS BLOCK CO., INC.
PROPOSED MANUFACTURING FACILITY
APN'S: 0260-061-67-0000, 0260-061-41-0000, 0260-061-42-0000
RIALTO, CA 92316

LICENSED ARCHITECT
FRANK J. LONI
C-35616
REN. 7/31/2021
STATE OF CALIFORNIA

LONI architects
LONI, INC. architecture + engineering
1050 Lakes Dr. #225 | West Covina, CA 91790
T: 626.588.1977
E: admin@loniarchitects.com
www.loniarchitects.com

Drawn By: F. LONI
Signed: 2/10/2021
Sheet A1.01
Job Number 19-050

ENLARGED SITE PLAN - NORTHERLY SECTION

1" = 50'-0"   1

SITE PLAN KEY:

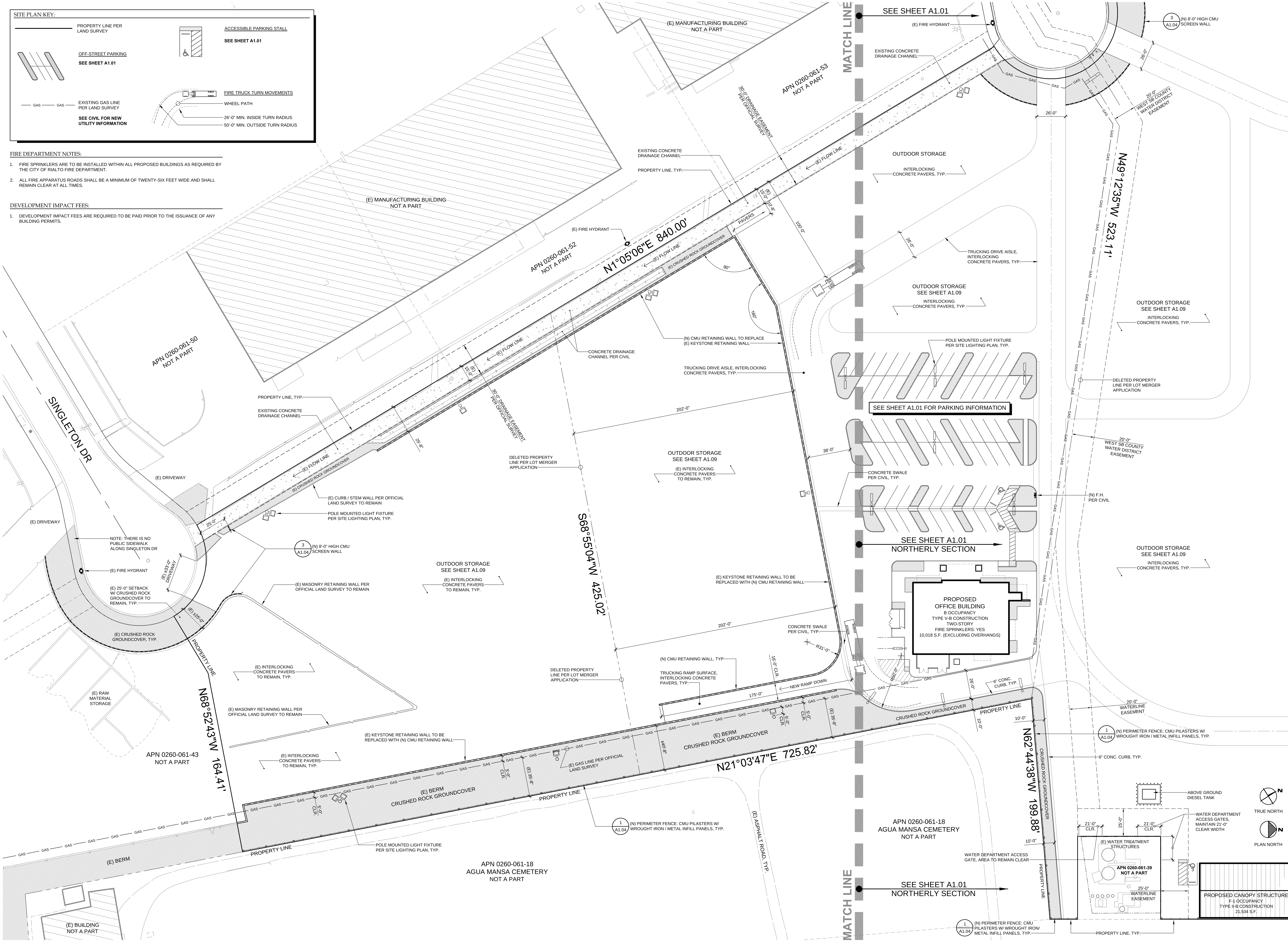
- PROPERTY LINE PER LAND SURVEY
- OFF-STREET PARKING — SEE SHEET A1.01
- EXISTING GAS LINE PER LAND SURVEY — SEE CIVIL FOR NEW UTILITY INFORMATION
- ACCESSIBLE PARKING STALL — SEE SHEET A1.01
- FIRE TRUCK TURN MOVEMENTS — WHEEL PATH; 26'-0" MIN. INSIDE TURN RADIUS; 50'-0" MIN. OUTSIDE TURN RADIUS

FIRE DEPARTMENT NOTES:

1. FIRE SPRINKLERS ARE TO BE INSTALLED WITHIN ALL PROPOSED BUILDINGS AS REQUIRED BY THE CITY OF RIALTO FIRE DEPARTMENT.
2. ALL FIRE APPARATUS ROADS SHALL BE A MINIMUM OF TWENTY-SIX FEET WIDE AND SHALL REMAIN CLEAR AT ALL TIMES.

DEVELOPMENT IMPACT FEES:

1. DEVELOPMENT IMPACT FEES ARE REQUIRED TO BE PAID PRIOR TO THE ISSUANCE OF ANY BUILDING PERMITS.



ENLARGED SITE PLAN - SOUTHERLY SECTION 1" = 30'-0" 1

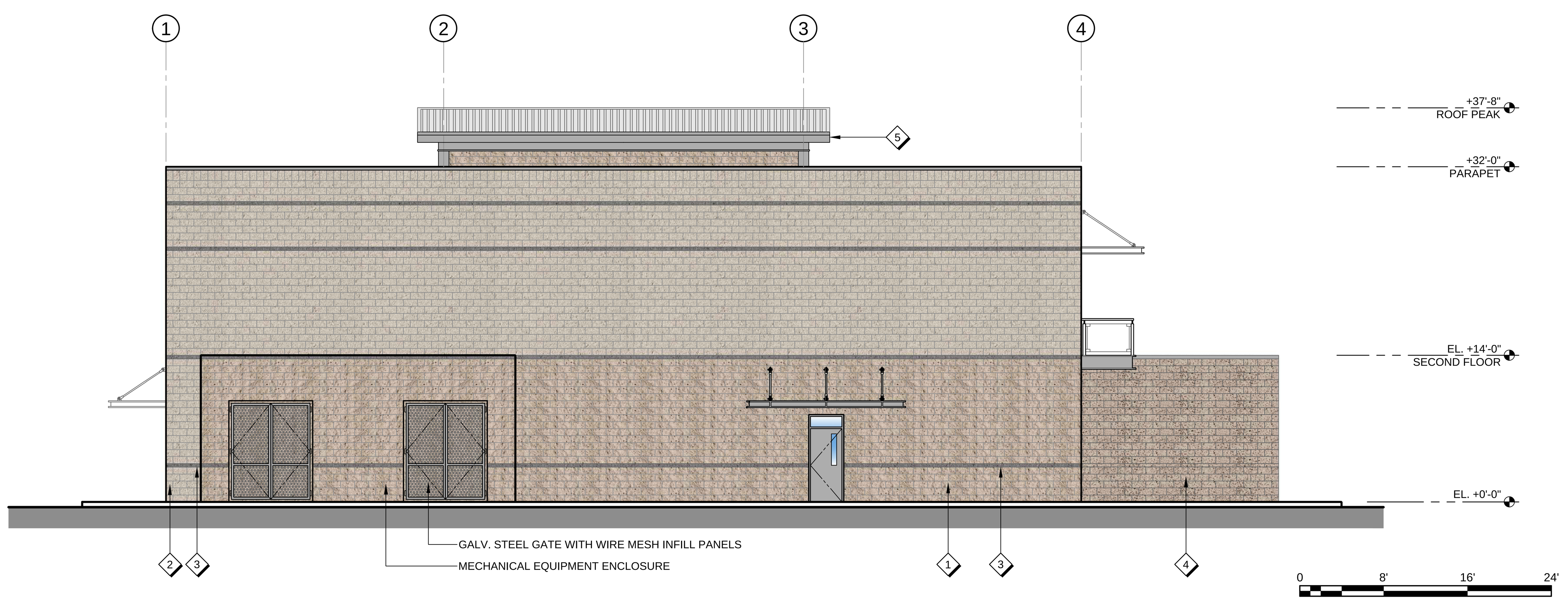
ANGELUS BLOCK CO., INC.
PROPOSED MANUFACTURING FACILITY
APN'S: 0260-061-67-0000, 0260-061-11-0000, 0260-061-42-0000
RIALTO, CA 92316

LICENSED ARCHITECT FRANK J. LONI C-35616 STATE OF CALIFORNIA

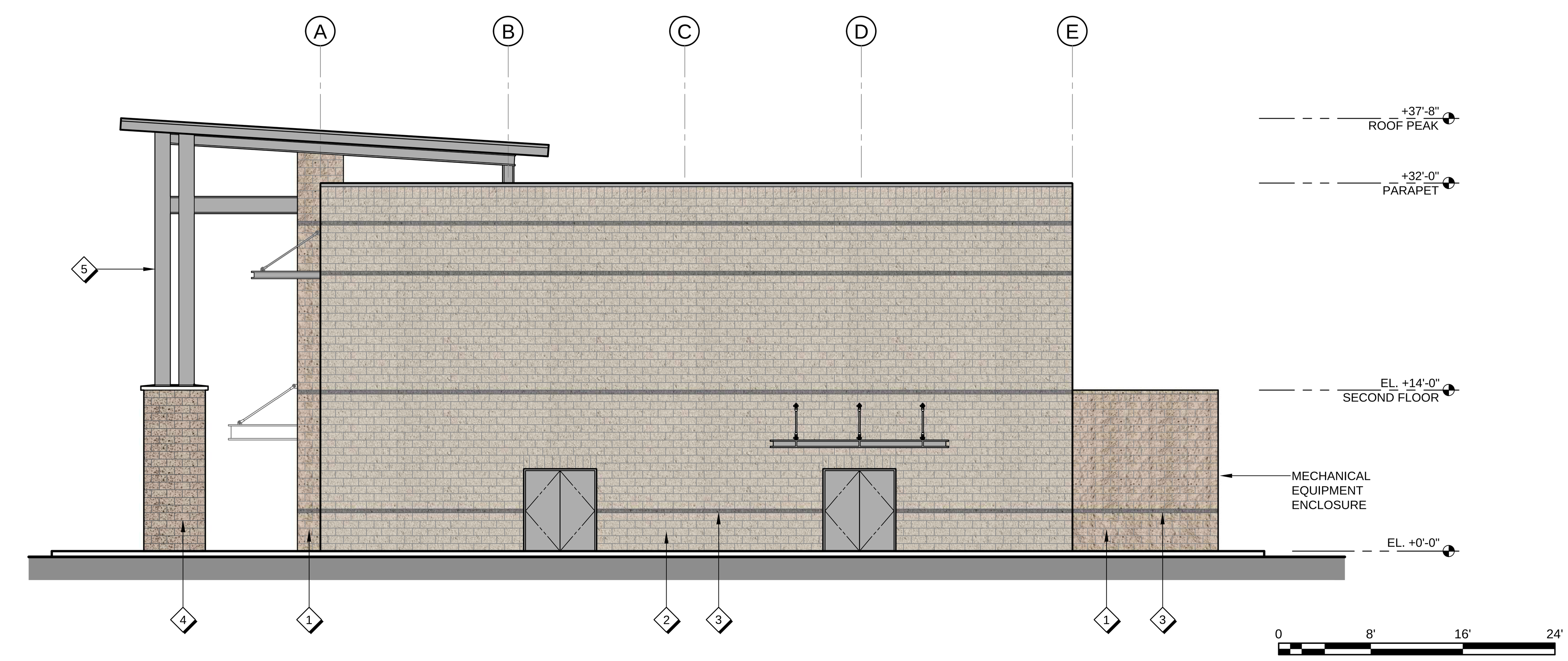
LONI architects
LONI, INC. architecture + engineering
1050 Lakes Dr. #225 | West Covina, CA 91790
T: 626.588.1977
E: admin@loniarchitects.com
www.loniarchitects.com

Drawn By F. LONI | Signed 2/10/2021 | Permit No. | Permit Date

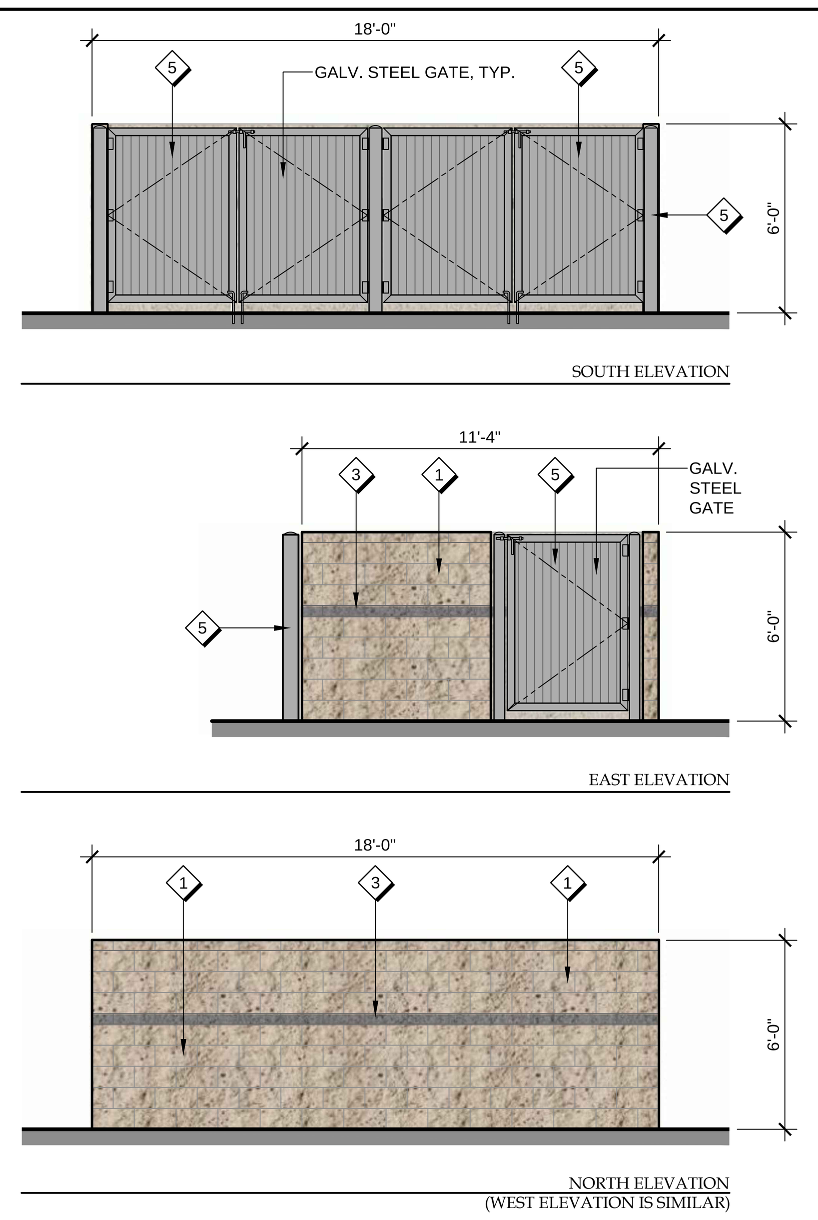
Sheet A1.02 | Job Number 19-050



OFFICE BUILDING - EAST ELEVATION | 1/8" = 1'-0" | 4



OFFICE BUILDING - SOUTH ELEVATION | 1/8" = 1'-0" | 3



TRASH ENCLOSURE | 1/4" = 1'-0" | 5

OFFICE BUILDING - NORTH ELEVATION | 3/16" = 1'-0" | 2

MATERIAL & COLOR SAMPLE BOARD:

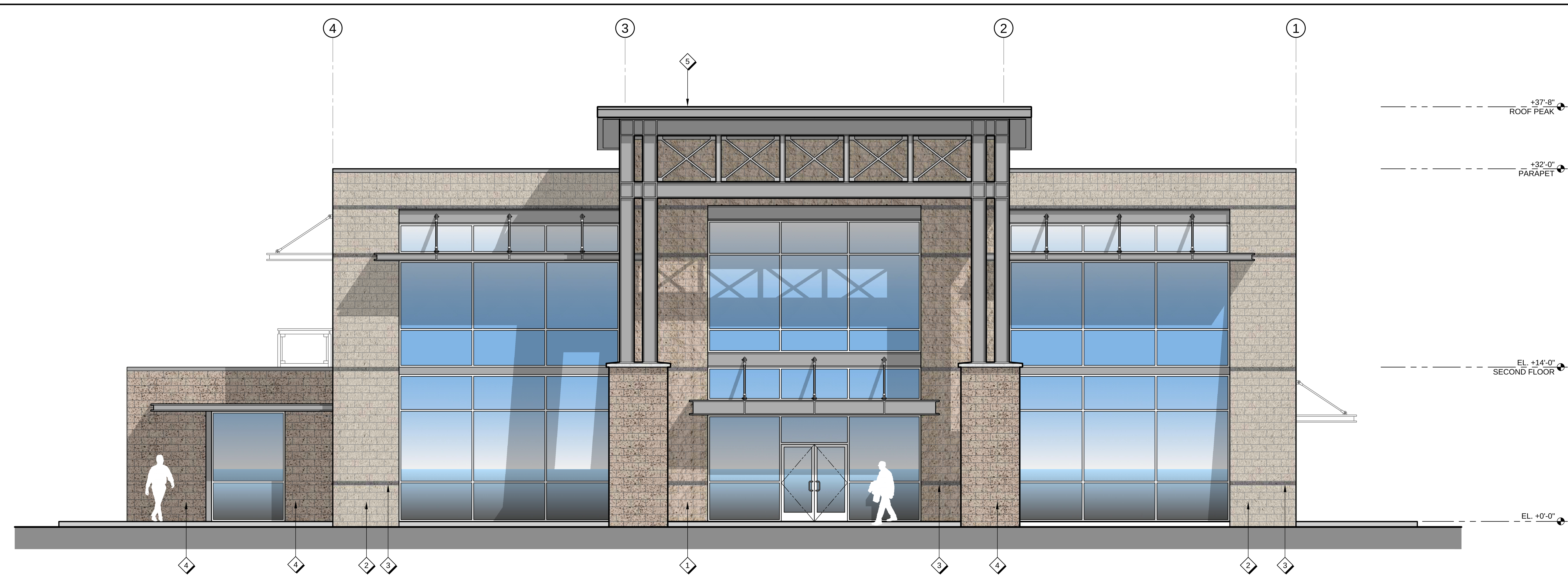
1 8"x16" CONCRETE MASONRY, 'ANGELUS BLOCK' NATURAL GRAY SPLIT FACE

2 8"x16" CONCRETE MASONRY, 'ANGELUS BLOCK' NATURAL GRAY PRECISION

3 4"x16" CONCRETE MASONRY, 'ANGELUS BLOCK' GREYSTONE PRECISION

4 8"x16" CONCRETE MASONRY, 'ANGELUS BLOCK' NATURAL GRAY BURNISHED

5 PAINTED STEEL ARCHITECTURAL COMPONENTS LIGHT GRAY



OFFICE BUILDING - WEST ELEVATION | 3/16" = 1'-0" | 1

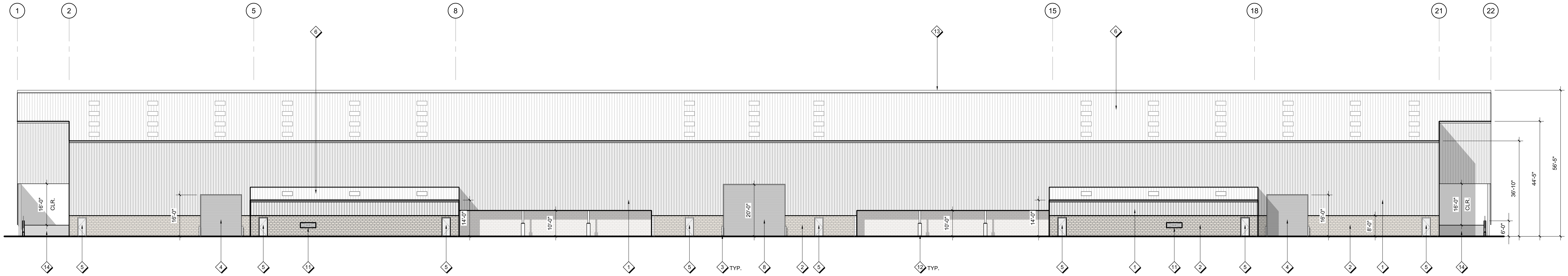
ANGELUS BLOCK CO., INC.
PROPOSED MANUFACTURING FACILITY
APN'S: 0260-061-67-0000, 0260-061-41-0000, 0260-061-42-0000
RIALTO, CA 92316

Mark | Date | Revisions

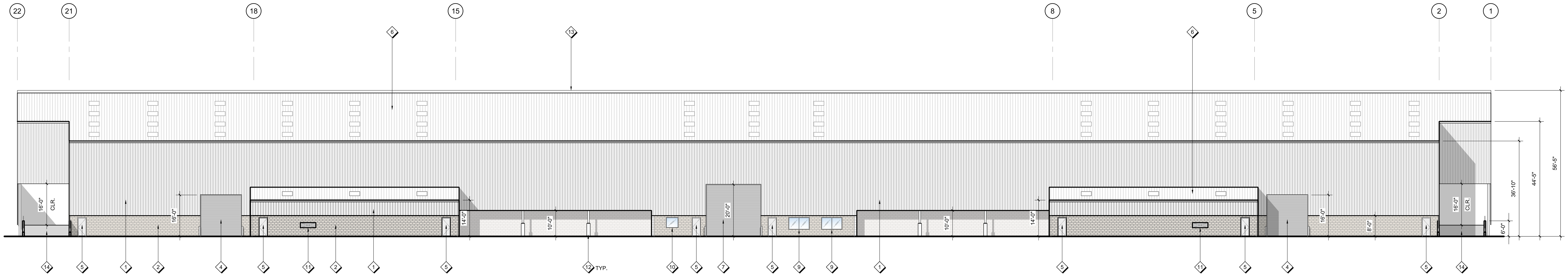
LICENSED ARCHITECT
FRANK J. LONI
C-35616
REN. 7/31/2021
STATE OF CALIFORNIA

LONI architects
LONI, INC.
architecture + engineering
1050 Lakes Dr. #225 | West Covina, CA 91790
T: 626.588.1977
E: admin@loniarchitects.com
www.loniarchitects.com

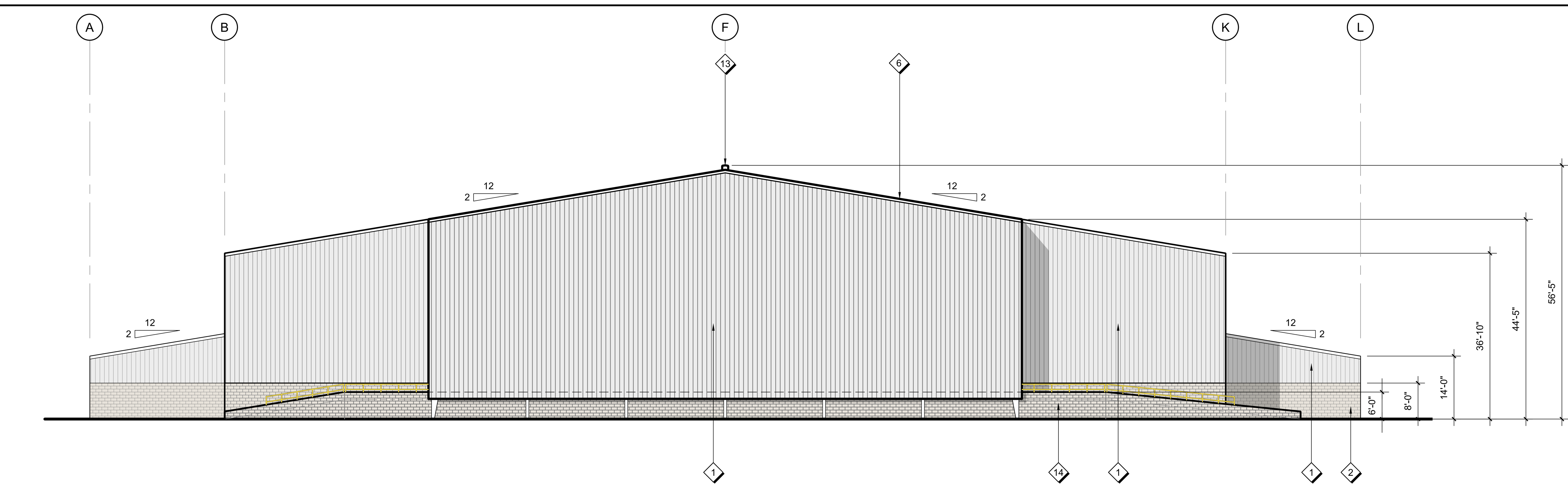
Sheet A2.10
Drawn By F. LONI
Signed 11/24/2020
Permit No.
Permit Date
Job Number 19-050



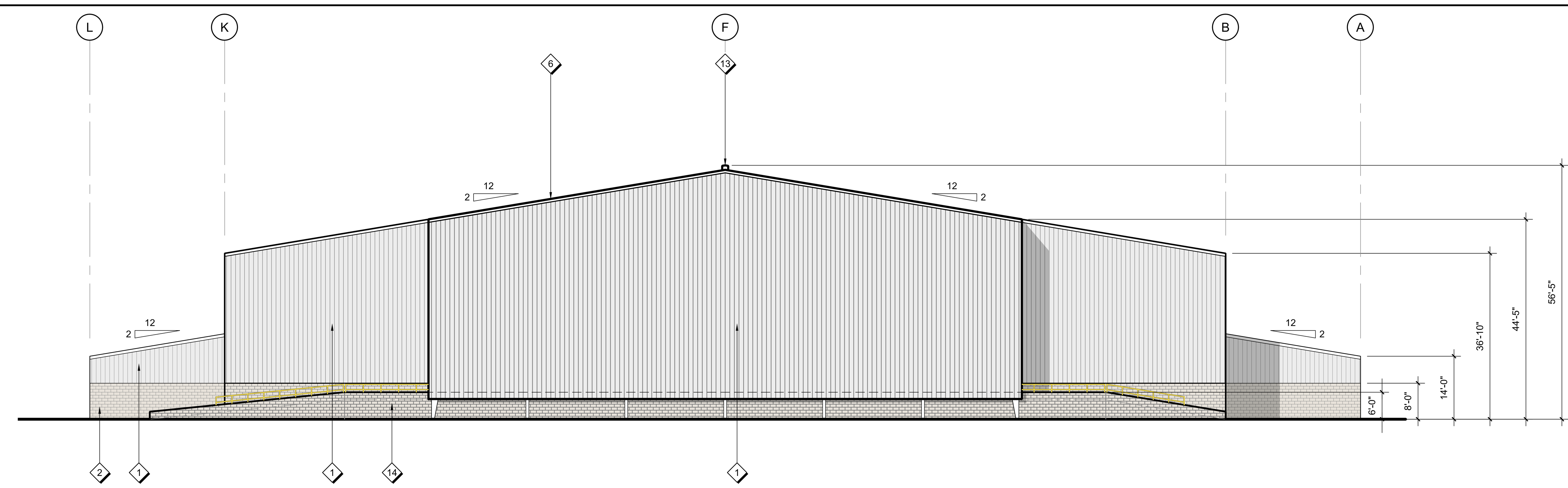
MANUFACTURING PLANT - WEST ELEVATION | 1/16" = 1'-0" | 4



MANUFACTURING PLANT - EAST ELEVATION | 1/16" = 1'-0" | 3



MANUFACTURING PLANT - SOUTH ELEVATION | 1/16" = 1'-0" | 2



MANUFACTURING PLANT - NORTH ELEVATION | 1/16" = 1'-0" | 1

KEYNOTES

1. CORRUGATED METAL PANELS, COLOR: LIGHT GRAY
2. CMU BASE WALL, 8"x8"x16", NATURAL GRAY SPLIT FACE
3. 48"H CONCRETE FILLED STEEL BOLLARD, PAINTED SAFETY YELLOW
4. 16'-0"W x 16'-0"H OVERHEAD COILING STEEL DOOR
5. 3'-0"W x 7'-0"H MAN DOOR
6. CORRUGATED METAL PANELS W/ TRANSLUCENT, PANELS COLOR: LIGHT GRAY
7. 21'-4"W X 20'-0"H OVERHEAD COILING STEEL DOOR
8. 24'-0"W x 20'-0"H OVERHEAD COILING STEEL DOOR
9. 8'-0"W x 4'-8"H WINDOW
10. 4'-8"W x 4'-0"H WINDOW
11. 6'-0"W x 2'-0"H OFFLOAD CONVEYOR OPENING
12. 5'-0"H CONCRETE COLUMN BASE PROTECTION
13. CONTINUOUS RIDGE VENT
14. DRIVE-OVER HOPPERS

Mark	Revisions	Date

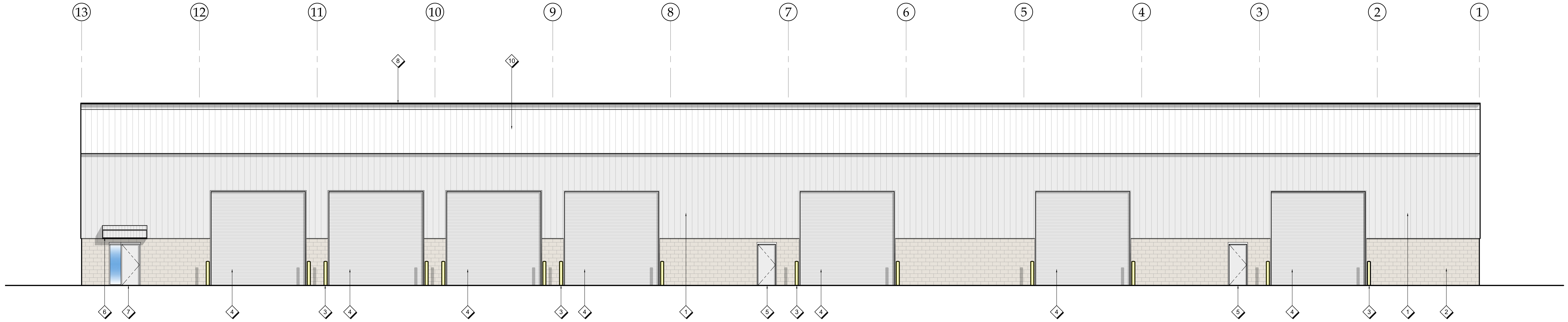
Mark	Revisions	Date

ANGELUS BLOCK CO., INC.
PROPOSED MANUFACTURING FACILITY
APN'S: 0260-061-67-0000, 0260-061-41-0000, 0260-061-42-0000
RIALTO, CA 92316

LICENSED ARCHITECT
FRANK J. LONI
C-35616
REN. 7/31/2021
STATE OF CALIFORNIA

LONI, INC.
architecture + engineering
1050 Lakes Dr. #225 | West Covina, CA 91790
T: 626.508.1977
E: admin@loniarchitects.com
www.loniarchitects.com
LONI architects

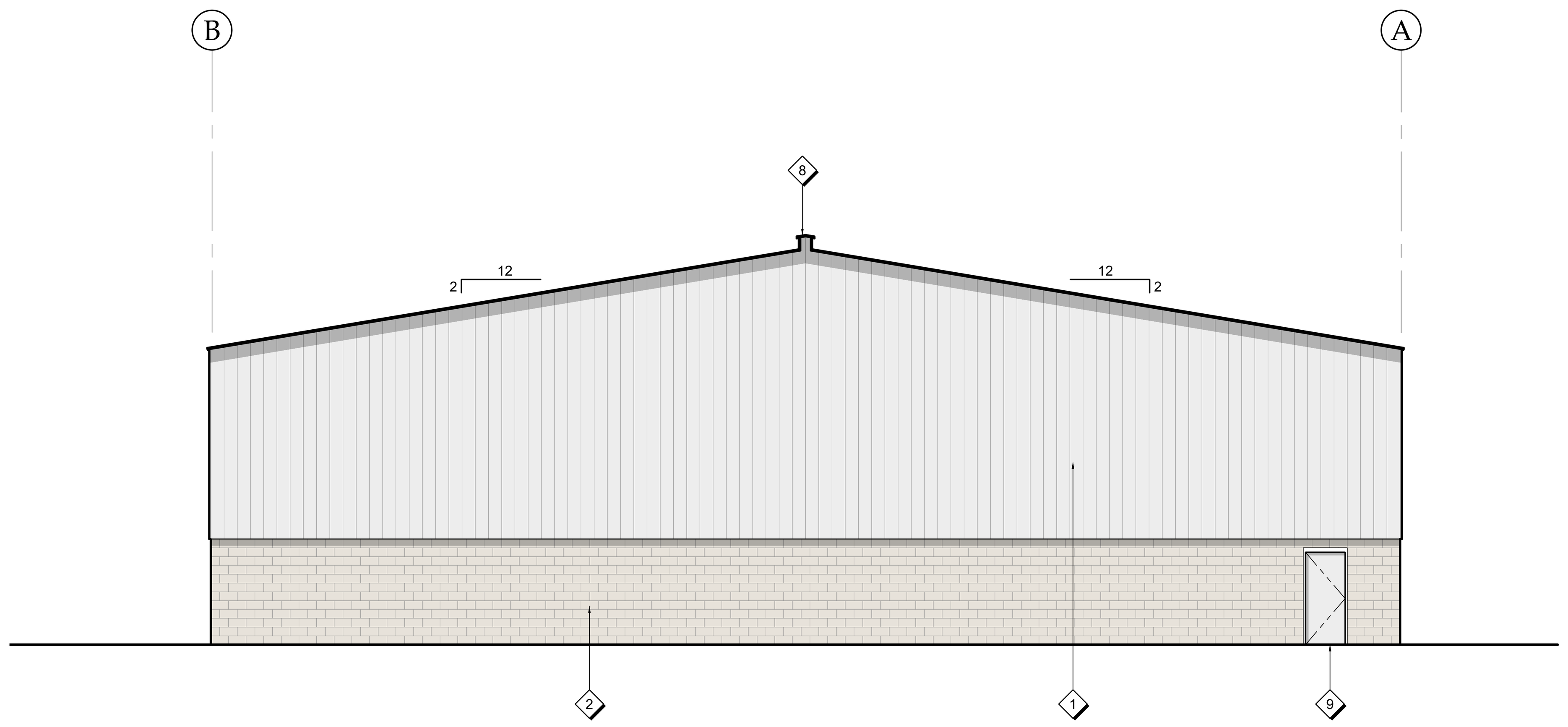
Permit No.	Permit Date
Drawn By: D. HYLTON	Signed: 11/24/2020
Sheet: A2.11	Job Number: 19-050



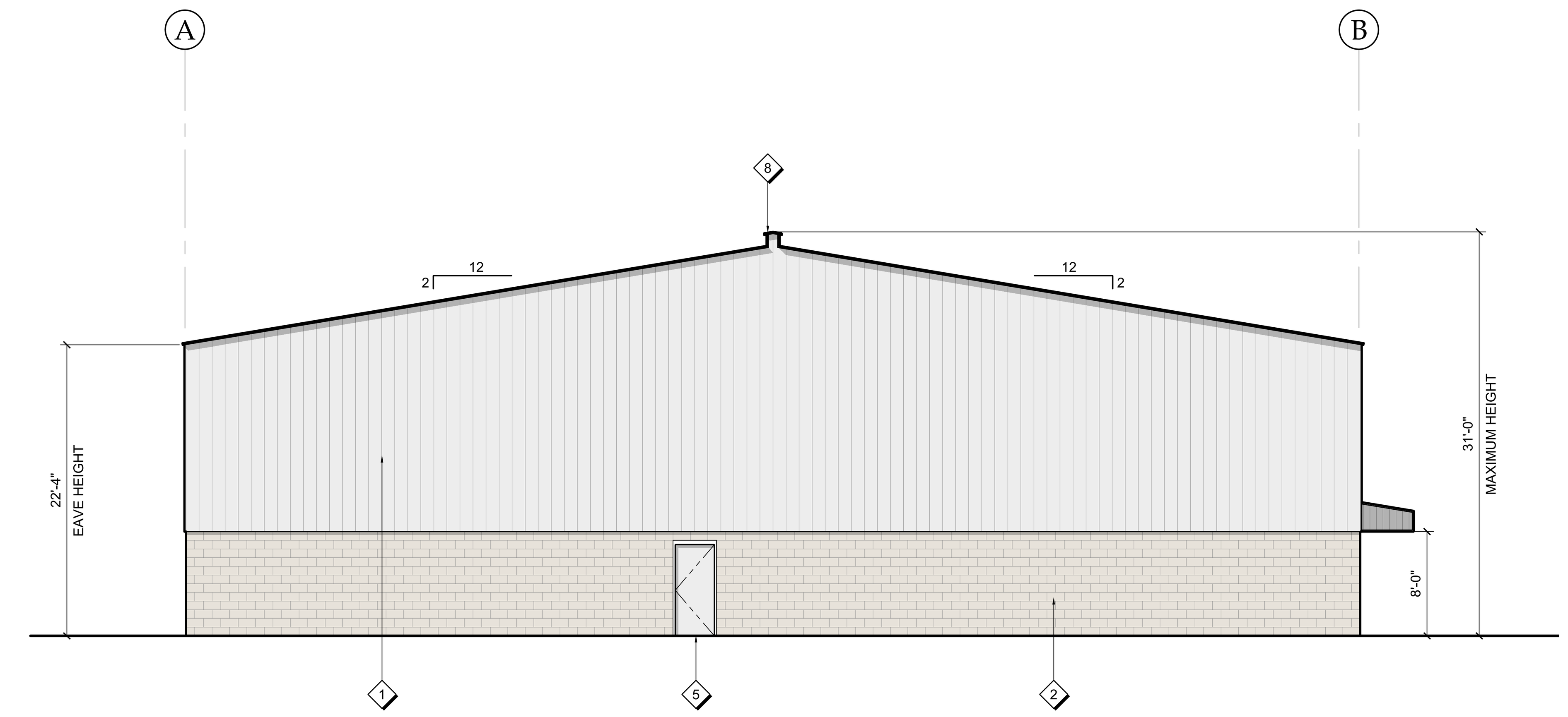
WEST ELEVATION
1/8"=1'-0" | 4

KEY NOTES:

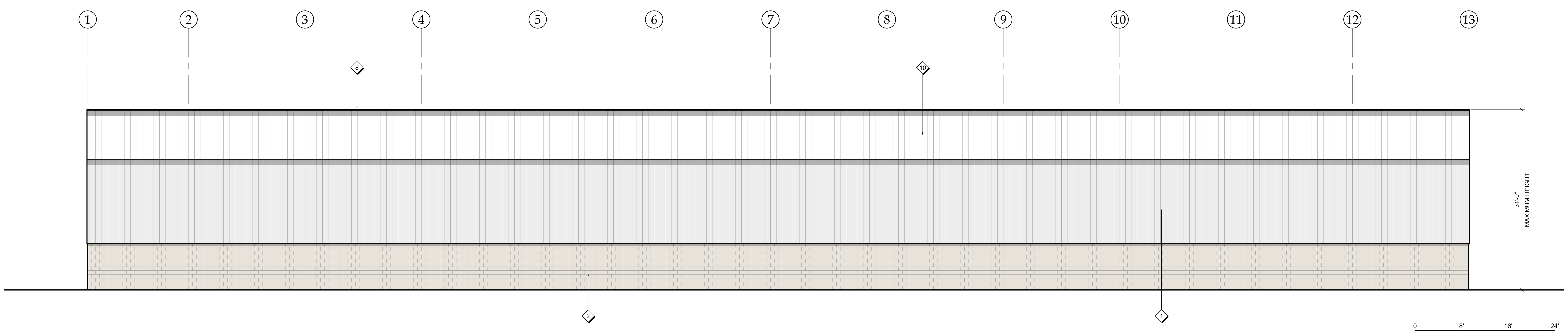
1. CORRUGATED METAL PANELS, COLOR: LIGHT GRAY
2. CMU BASE WALL, 8"x8"x16", NATURAL GRAY SPLIT FACE
3. 48"H CONCRETE FILLED STEEL BOLLARD, PAINTED SAFETY YELLOW
4. 16'-0"W x 16'-0"H OVERHEAD COILING STEEL DOOR
5. 3'-0"W x 7'-0"H MAN DOOR
6. CORRUGATED METAL PANEL CANOPY, COLOR: LIGHT GRAY
7. 3'-0"W x 7'-0"H ENTRY DOOR w/ SIDELIGHT
8. CONTINUOUS RIDGE VENT
9. 3'-0"W x 7'-0"H FIRE DEPT. ACCESS DOOR
10. CORRUGATED METAL PANELS w/ TRANSLUCENT PANELS, SEE ROOF PLAN, COLOR: LIGHT GRAY



SOUTH ELEVATION
1/8"=1'-0" | 3



NORTH ELEVATION
1/8"=1'-0" | 2



WAREHOUSE AND INDUSTRIAL BUIILDING - EAST ELEVATION
1/8"=1'-0" | 1

Mark	Revisions	Date

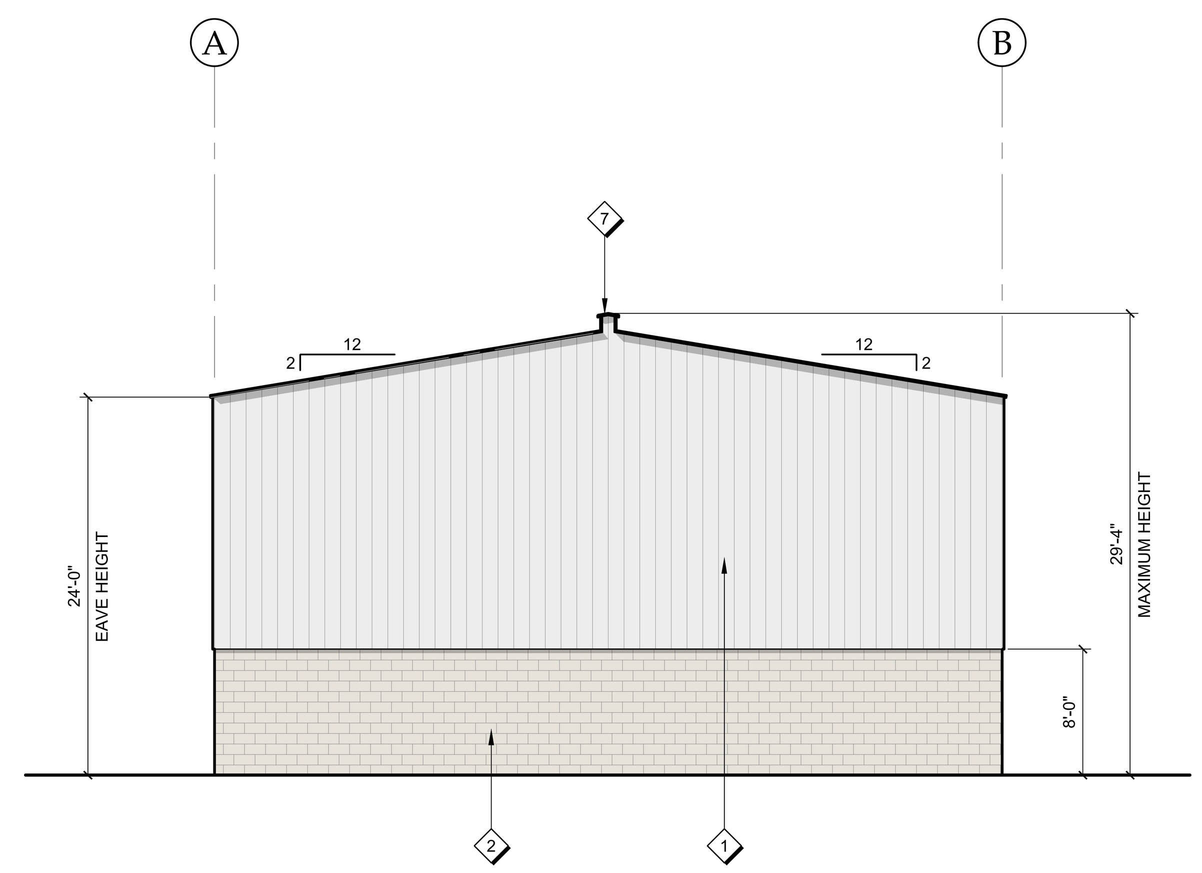
Mark	Revisions	Date

ANGELUS BLOCK CO., INC.
PROPOSED MANUFACTURING FACILITY
APN'S: 0260-061-67-0000, 0260-061-41-0000, 0260-061-42-0000
RIALTO, CA 92316

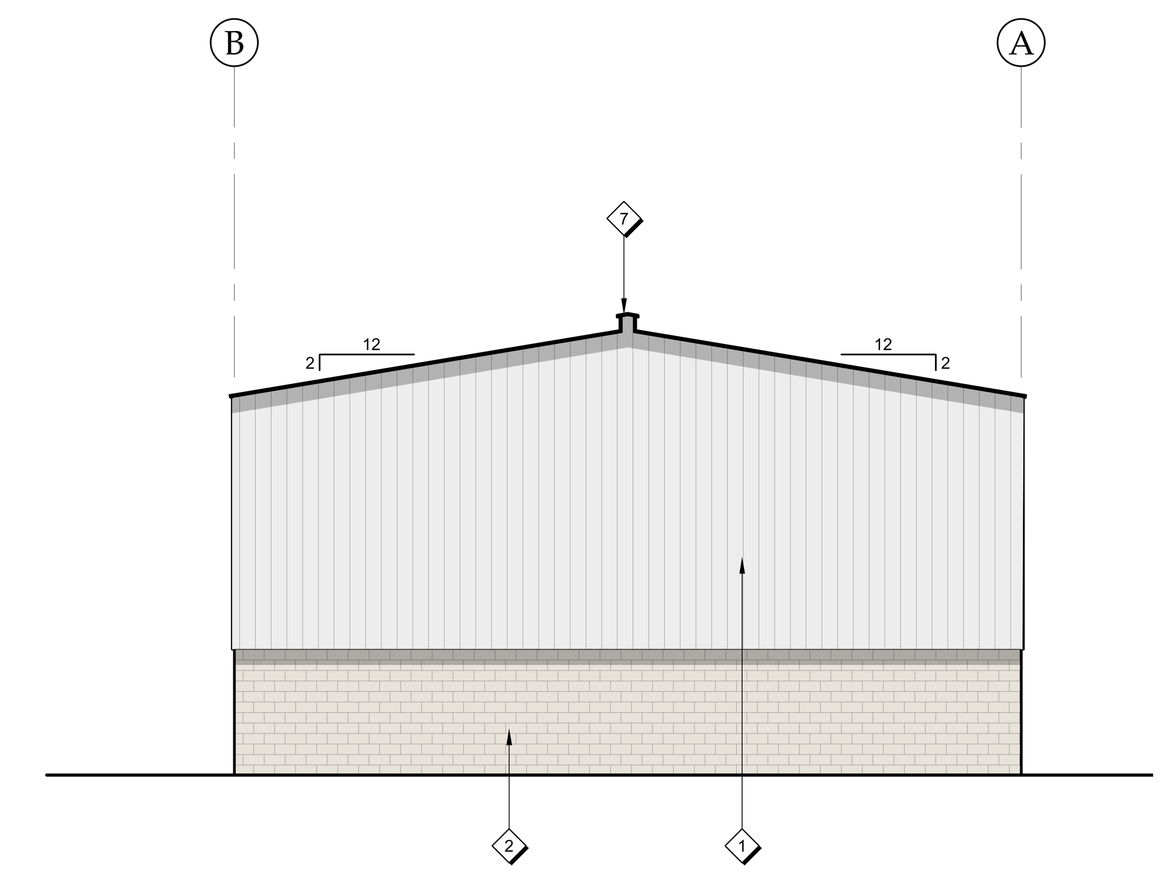
LICENSED ARCHITECT
FRANK J. LONI
C-35616
REN. 7/31/2021
STATE OF CALIFORNIA

LONI architects
LONI, INC.
architecture + engineering
1050 Lakes Dr. #225 | West Covina, CA 91790
T: 626.508.1977
E: admin@loniarchitects.com
www.loniarchitects.com

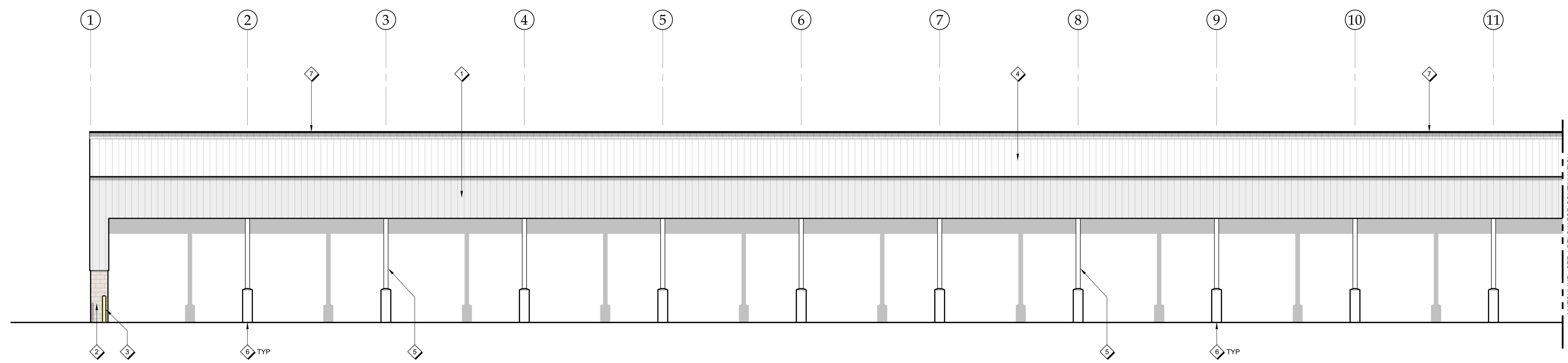
Permit No.	Permit Date
Drawn By JEST	Signed 11/24/2020
Sheet A2.12	
Job Number 19-050	



NORTH ELEVATION | 1/8"=1'-0" | 4



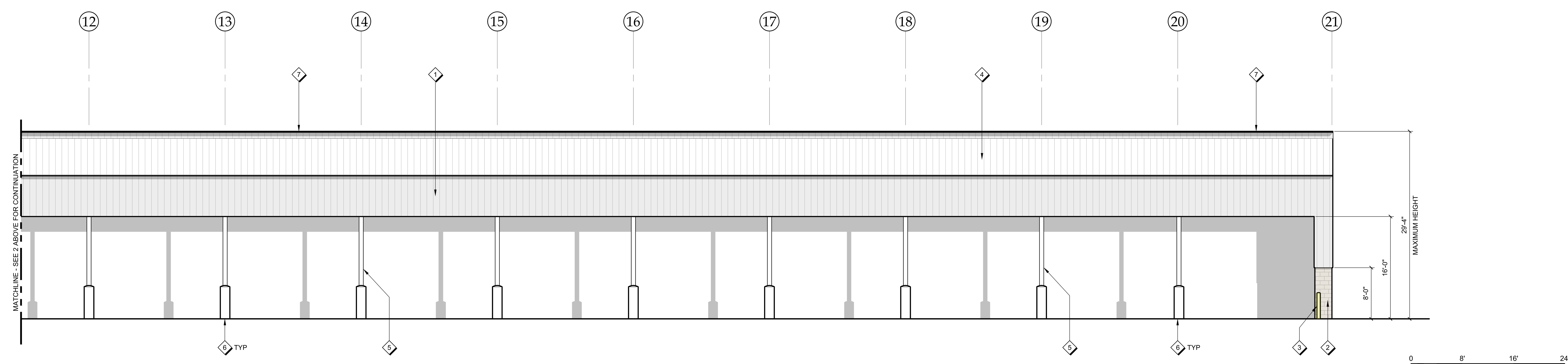
SOUTH ELEVATION | 1/8"=1'-0" | 3



PARTIAL WEST ELEVATION | 1/8"=1'-0" | 2

KEY NOTES:

1. CORRUGATED METAL PANELS, COLOR: LIGHT GRAY
2. CMU BASE WALL, 8"x8"x16", NATURAL GRAY SPLIT FACE
3. 48"H CONCRETE FILLED STEEL BOLLARD, PAINTED SAFETY YELLOW
4. CORRUGATED METAL PANELS w/ TRANSLUCENT PANELS, SEE ROOF PLAN, COLOR: LIGHT GRAY
5. STRUCTURAL COLUMN
6. 5'-0"H CONCRETE COLUMN BASE PROTECTION
7. CONTINUOUS RIDGE VENT



CANOPY STRUCTURE - PARTIAL WEST ELEVATION | 1/8"=1'-0" | 1

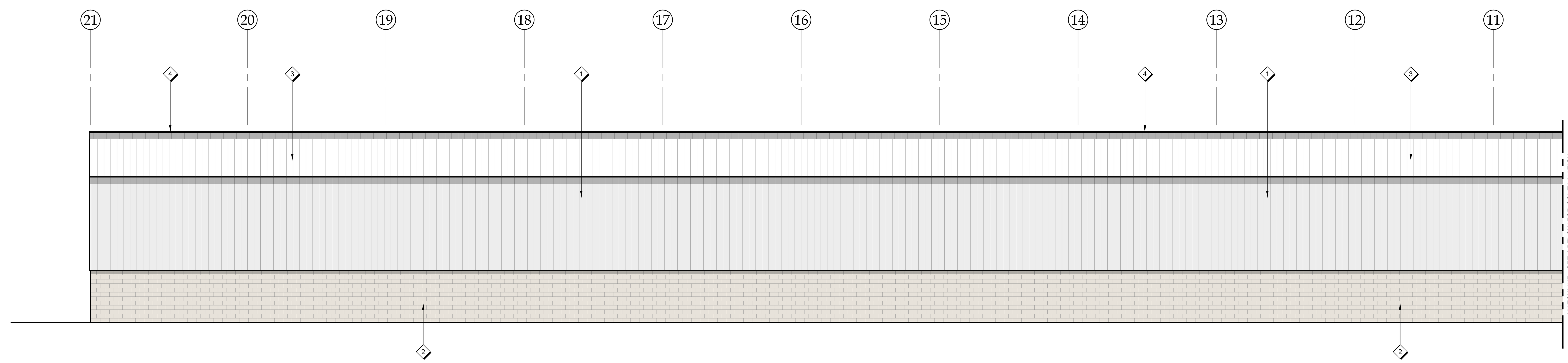
ANGELUS BLOCK CO., INC.
PROPOSED MANUFACTURING FACILITY
APN'S: 0260-061-67-0000, 0260-061-41-0000, 0260-061-42-0000
RIALTO, CA 92316

Mark	Revisions	Date

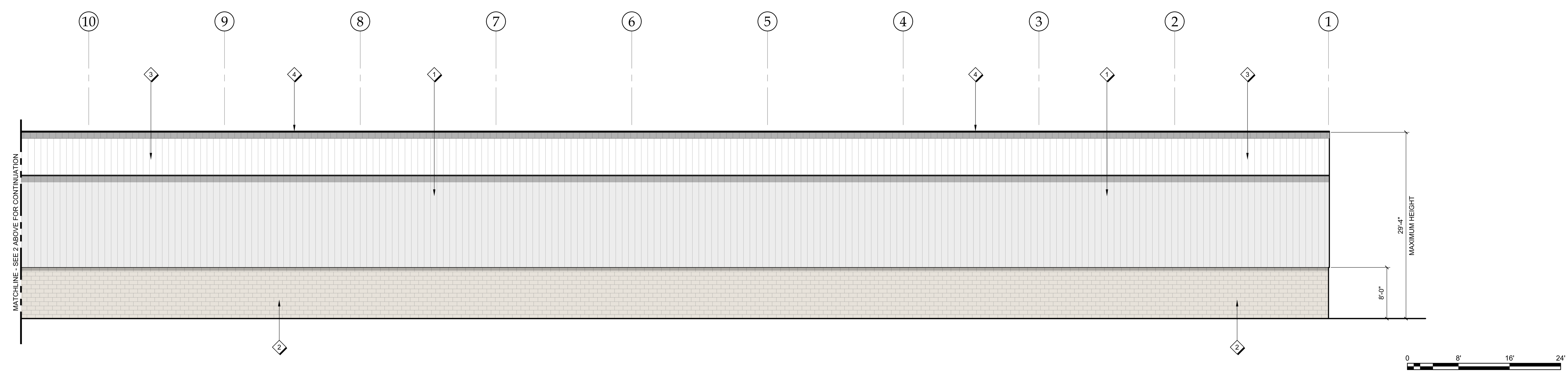
LICENSED ARCHITECT FRANK J. LONI C-35616 STATE OF CALIFORNIA

LONI architects
LONI, INC.
architecture + engineering
1050 Lakes Dr. #225 | West Covina, CA 91790
T: 626.508.1977
E: admin@loniarchitects.com
www.loniarchitects.com

Permit No. | Permit Date
Drawn By JEST
Signed 11/24/2020
Sheet A2.13
Job Number 19-050



PARTIAL EAST ELEVATION | 1/8"=1'-0" | 2



CANOPY STRUCTURE - PARTIAL EAST ELEVATION | 1/8"=1'-0" | 1

KEY NOTES:

1. CORRUGATED METAL PANELS, COLOR: LIGHT GRAY
2. CMU BASE WALL, 8"x8"x16", NATURAL GRAY SPLIT FACE
3. CORRUGATED METAL PANELS w/ TRANSLUCENT PANELS, SEE ROOF PLAN, COLOR: LIGHT GRAY
4. CONTINUOUS RIDGE VENT

Mark	Revisions	Date

Mark	Revisions	Date

ANGELUS BLOCK CO., INC.

PROPOSED MANUFACTURING FACILITY
APN'S: 0260-061-67-0000, 0260-061-41-0000, 0260-061-42-0000
RIALTO, CA 92316

LICENSED ARCHITECT
FRANK J. LONI
C-35616
REN. 7/31/2021
STATE OF CALIFORNIA

LONI architects
LONI, INC.
architecture + engineering
1050 Lakes Dr. #225 | West Covina, CA 91790
T: 626.508.1977
E: admin@loniarchitects.com
www.loniarchitects.com

Permit No.	Permit Date
Drawn By JEST	Signed 11/24/2020
Sheet A2.14	
Job Number 19-050	

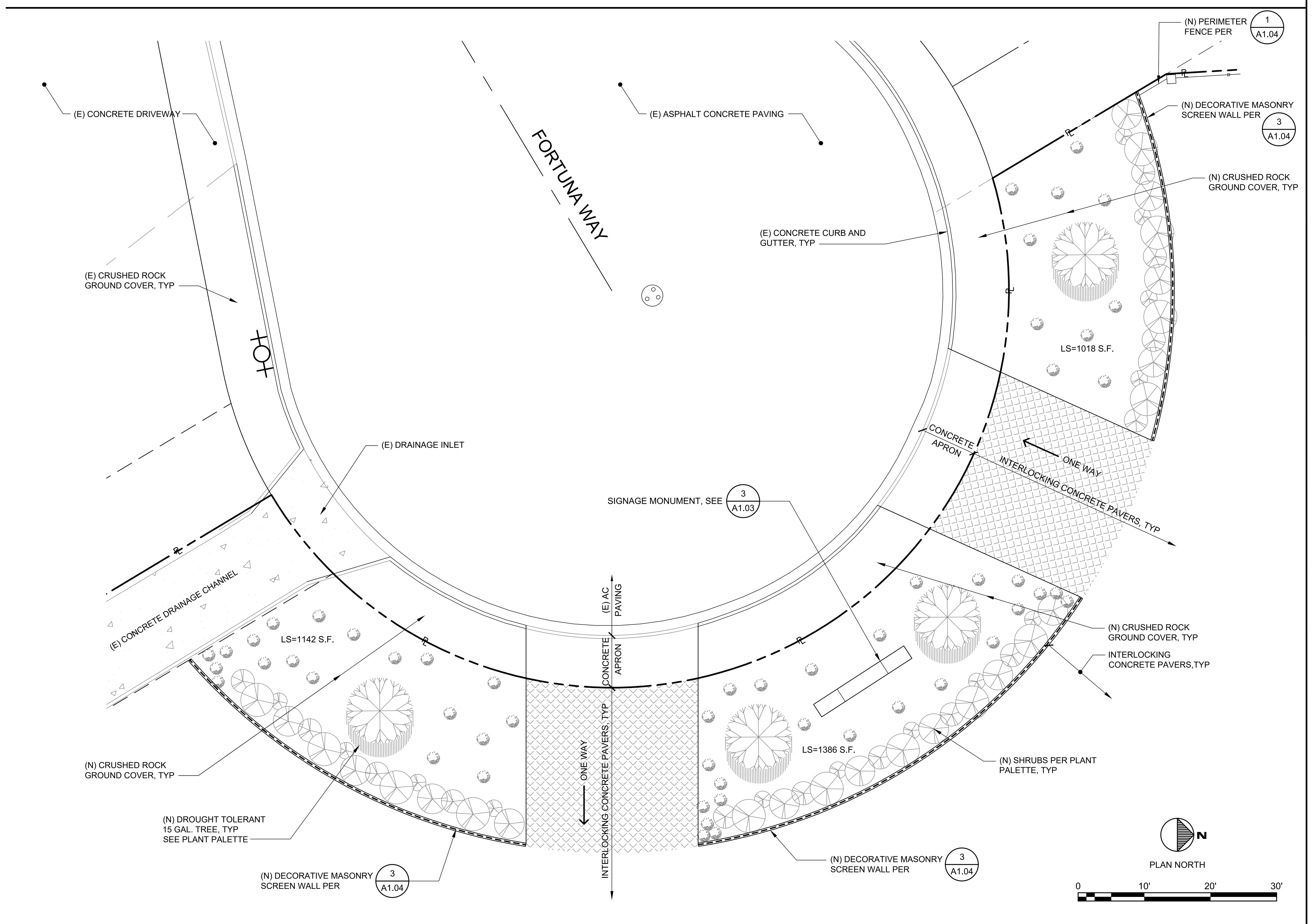
GENERAL LANDSCAPING NOTES

PER CITY OF RIALTO MUNICIPAL CODE SECTION 18.58.030-(K):

1. A MINIMUM OF TEN PERCENT OF THE REQUIRED GROSS OFF-STREET PARKING AREA SHALL BE LANDSCAPED. THE PARKING AREA SHALL INCLUDE ACCESS DRIVES, AISLES, STALLS, MANEUVERING AREAS AND REQUIRED LANDSCAPE SETBACKS AROUND THE PERIMETER OF THE PARKING FACILITY.
2. WHERE REQUIRED BY THE DEVELOPMENT REVIEW COMMITTEE, LANDSCAPED AREAS SHALL BE ANNEXED INTO THE CITY OF RIALTO LANDSCAPE MAINTENANCE DISTRICT NO. 1, AS PROVIDED BY DIVISION 15 OF THE STATE STREETS AND HIGHWAYS CODE AND CITY POLICY.
3. LANDSCAPE MATERIALS SHALL INCLUDE PLANTS ACCEPTABLE TO THE DIRECTOR OF DEVELOPMENT SERVICES AND SHALL EMPHASIZE THE USE OF DROUGHT-RESISTANT GROUND COVERS, SHRUBS AND TREES TO THE EXTENT FEASIBLE. AT LEAST ONE FIFTEEN GALLON TREE SHALL BE INSTALLED AND MAINTAINED FOR EVERY FIVE PARKING STALLS IN THE PARKING FACILITY. SUCH TREES MAY BE CLUSTERED OR GROUPED IF APPROVED BY THE DIRECTOR OF DEVELOPMENT SERVICES.
4. AN IRRIGATION SYSTEM IN AGREEMENT WITH AN IRRIGATION PLAN ACCEPTABLE TO THE DIRECTOR OF DEVELOPMENT SERVICES SHALL BE INSTALLED AND MAINTAINED IN WORKING ORDER.
5. LANDSCAPING SHALL BE CONTINUOUSLY MAINTAINED AND REPLANTED AS NECESSARY. LANDSCAPED AREAS SHALL BE KEPT FREE OF DEBRIS AND LITTER.
6. LANDSCAPED AREAS SHALL BE SEPARATED FROM VEHICLE PARKING AND CIRCULATION AREAS BY CONCRETE CURBS NOT LESS THAN SIX INCHES IN HEIGHT.

PRELIMINARY PLANT PALETTE

BOTANICAL NAME	COMMON NAME
TREES (15 GAL. MIN)	
GLEDITSIA TRIACANTHOS	HONEY LOCUST
CERCIS CANADESIS	EASTERN REDBUD
PISTACIA CHINENSIS	CHINESE PISTACHE
SHRUBS/PERENNIALS	
MUHLENBERGIA RIGENS	DEER GRASS
SIMMONDSIA CHINENSIS	JOJOBA
PHLOMIS LANATA	WOOLLY JERUSALEM SAGE
FOUQUIERIA SPLENDENS	OCOTILLO
SANTOLINA PINNATA	SANTOLINA
SALVIA DIVINORUM	SALVIA
SANTOLINA CHAEMACYPARISSUS	LAVENDER COTTON
HESPERALOE PARVIFLORA	RED YUCCA
CORTADERIA SELLOANA	PAMPAS GRASS
GROUND COVERS	
BACCHARIS PILULARIS	DWARF COYOTE BUSH
ROSEMARY PROSTRATUS	ROSEMARY
HELICTOTRICHON SEMPERVIRENS	BLUE OAT GRASS

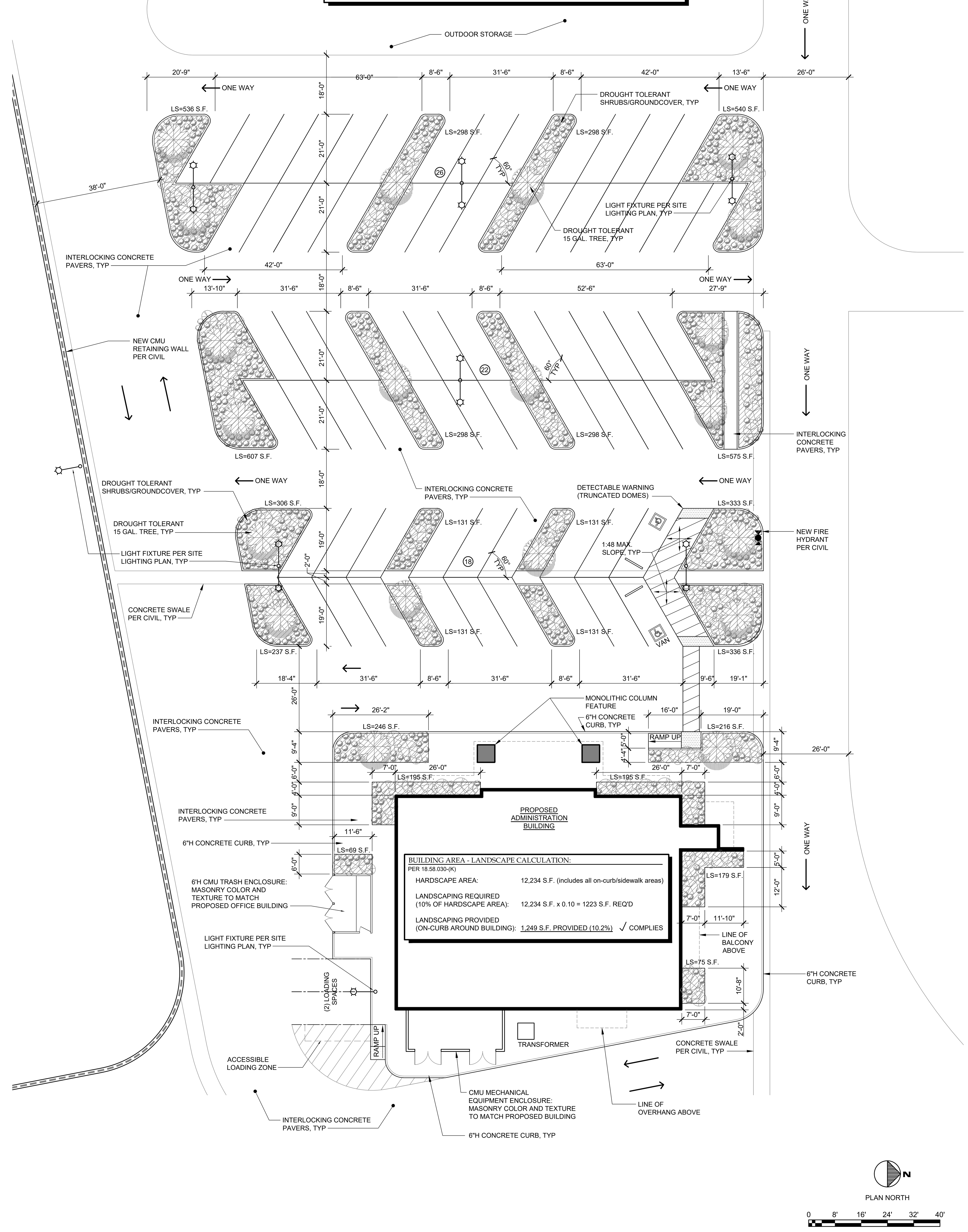


PRELIMINARY LANDSCAPING PLAN | 1" = 10'-0" | 2

PARKING AREA - LANDSCAPE CALCULATION:

PER 18.58.030-(K)

GROSS PARKING AREA:	48,623 S.F. *(includes access drives, aisles, stalls, maneuvering areas)*
LANDSCAPING REQUIRED (10% OF PARKING AREA):	48,623 S.F. x 0.10 = 4,863 S.F. REQUIRED
LANDSCAPING PROVIDED AT PARKING AREA:	5,182 S.F. PROVIDED (10.6%) ✓COMPLIES



BUILDING AREA - LANDSCAPE CALCULATION:

PER 18.58.030-(K)

HARDSCAPE AREA:	12,234 S.F. (includes all on-curb/sidewalk areas)
LANDSCAPING REQUIRED (10% OF HARDSCAPE AREA):	12,234 S.F. x 0.10 = 1223 S.F. REQ'D
LANDSCAPING PROVIDED (ON-CURB AROUND BUILDING):	1,249 S.F. PROVIDED (10.2%) ✓ COMPLIES

PRELIMINARY LANDSCAPING PLAN | 1/16" = 1'-0" | 1

Mark	Date	Revisions

ANGELUS BLOCK CO., INC.

PROPOSED MANUFACTURING FACILITY
APN'S: 0260-061-67-0000, 0260-061-41-0000, 0260-061-42-0000
RIALTO, CA 92316

LICENSED ARCHITECT
FRANK J. LONI
C-35616
REN. 7/31/2021
STATE OF CALIFORNIA

LONI architects
LONI, INC.
architecture + engineering
1050 Lakes Dr. #225 | West Covina, CA 91790
T: 626.508.1977
E: admin@loniarchitects.com
www.loniarchitects.com

Sheet L1.01
Drawn By: F. LONI
Signed: 02/11/2021
Permit No.
Permit Date
Job Number 19-050

DRAFT Mitigation and Monitoring Program for the Angelus Block Co Inc. – Rialto Block Plant

October 11, 2021

Prepared For:

CITY OF RIALTO
150 South Palm Avenue
Rialto, CA 92376

Contact: Daniel Casey, Senior Planner

On behalf of:

ANGELUS BLOCK CO INC.
3435 S Riverside Ave
Rialto, CA 91316

NV5
3777 Long Beach Blvd, Annex Bldg
Long Beach, CA 90807

PREFACE

Section 21081.6 of the California Environmental Quality Act (CEQA) requires a Lead Agency to adopt a Mitigation Monitoring and Reporting Program (MMRP) whenever it approves a project for which measures have been required to mitigate or avoid significant effects on the environment. The purpose of the monitoring and reporting program is to ensure compliance with the mitigation measures during project implementation.

The Initial Study/Mitigated Negative Declaration prepared for the Angelus Block Rialto Block Plant concluded that the implementation of the project could result in significant effects on the environment and mitigation measures were incorporated into the proposed project or are required as a condition of project approval. This MMRP identifies those measures and how and when they will be implemented.

This document does not discuss those subjects for which the Initial Study/Mitigated Negative Declaration concluded that the impacts from implementation of the project would be less than significant.

TABLE OF CONTENTS

1.0 INTRODUCTION

The following MMRP will help assure that the mitigation measures contained in the Draft Initial Study, and as modified in this Final Initial Study/Mitigated Negative Declaration (IS/MND), are properly implemented according to State law. This MMRP identifies measures incorporated into the Project that reduce its potential environmental impacts, the entities responsible for implementation and monitoring of mitigation measures, and the appropriate timing for implementation of mitigation measures. As described in Section 15097 of the State California Environmental Quality Act (CEQA) Guidelines, this MMRP employs both reporting on and monitoring of Project mitigation measures.

The objectives of the MMRP are to:

- Assign responsibility for, and ensure proper implementation of, mitigation measures;
- Assign responsibility for, and provide for monitoring and reporting of compliance with mitigation measures; and
- Provide the mechanism to identify areas of non-compliance and the need for enforcement action before irreversible environmental damage occurs.

The MMRP for the Project is presented in the following Section (Section 2.0). Specific mitigation measures identified in the Final IS/MND, mitigation timing, and implementation and reporting/monitoring responsibilities are presented in this section in Table 2-1.

2.0 MITIGATION MONITORING AND REPORTING PROGRAM

As the Lead Agency, the City of Rialto (City) is responsible for ensuring full compliance with the mitigation measures adopted for the project. The City will monitor and report on all mitigation activities. If, during the course of Project implementation, any of the mitigation measures identified cannot be successfully implemented, the City shall immediately inform any affected responsible agencies. The City, in conjunction with any affected responsible agencies, will then determine if modification to the project is required, and/or whether alternative mitigation is appropriate. Table 2-1 below presents the implementation plans for the proposed mitigation measures for the Angelus Block IS/MND.

Table 2-1: Mitigation Monitoring and Reporting Program

#	Mitigation Measure	Implementation Responsibility	Agency Responsible for Monitoring	Monitoring/Reporting Action	Verification Record		
					Date	Comments	Initials
AIR QUALITY							
AQ-1	Purchase and utilize forklifts and portable equipment that meets or exceeds Tier 4 Final emission standards.	Project Applicant	City of Rialto Development Services Department, Planning Division	Imposition of conditions of approval for applicable land use applications.			
AQ-2	Utilize Tier 4 construction equipment.	Project Applicant/Construction Contractor	City of Rialto Development Services Department, Building Division (building construction)	Referenced as a note on grading plans and building plans. Site inspection.			
BIOLOGICAL RESOURCES							
BIO-1	Maintain the Delhi Sands flower-loving fly (DSFLF) “Conservation Area” and adhere to the established Incidental Take Permit and Implementation Agreement.	Project Applicant	City of Rialto Development Services Department, Planning Division	Imposition of conditions of approval for applicable land use applications.			
TRANSPORTATION							
TRA-1	Submit fair share cost of $724,397.81 to the City of Rialto related to the Development Impact Fee (DIF) for Intersection and Roadway Improvements.	Project Applicant	City of Rialto Development Services Department, Planning Division	Imposition of conditions of approval for applicable land use applications.			

Angelus
BLOCK CO., INC.
Since 1946

NV5 Delivering Solutions Improving Lives

CEQA Initial Study with Proposed Mitigated Negative Declaration
Angelus Block Co Inc. – Rialto Block Plant

October 11, 2021

Prepared For:

ANGELUS BLOCK CO INC.
3435 S Riverside Ave
Rialto, CA 91316

NV5

3777 Long Beach Blvd, Annex Bldg
Long Beach, CA 90807

AGLS-20-9598

EXECUTIVE SUMMARY

Angelus Block Co Inc., further referred to in this document as “Angelus,” proposed to construct and operate a new concrete block manufacturing facility in Rialto, California. The proposed new facility will be further referred to as the “Proposed Project.” The Proposed Project will occupy approximately 32 acres of land located at the terminus of Fortuna Way approximate 700 feet east of Riverside Avenue, which will be further referred to as the “Project Site.” The Project Site is approximately 2 miles south of Interstate 10 (“I-10”) and approximately 3.5 miles north, northwest of the junction of California State Routes 60 (“CA-60”) and 91 (“CA-91”). A Site Vicinity Map is provided as Figure 1, and the Project Site boundary is shown in Figure 2.

The Proposed Project involves the construction and operation of a new concrete block manufacturing facility. In general, the concrete block manufacturing process includes raw material delivery and storage; material transfer and mixing; product forming, curing, and finishing; and product storage, onsite movement, packaging, and shipment to customers. Finished products include a wide variety of concrete masonry units (CMUs) that provide structural strength and aesthetic facades for buildings constructed throughout California. Once operational, the Project Site will include a primary Manufacturing Plant Building, a two-story Admin Building, and additional support structures. The entire Project Site will be paved with interlocking, pervious concrete pavers except for structure footprints. There will be two gates at the terminus of Fortuna Way: one one-way entrance gate and one one-way exit gate. The gates will be opened and locked manually. A Site Plan is provided as Figure 3.

The normal operating schedule for the Proposed Project will be 18 hours per day, 5 days per week, and 52 weeks per year, and the maximum operating schedule will be 20 hours per day, 6 days per week, and 52 weeks per year. Typical operating hours for the Project Site will be from 04:00 to 22:00. The primary industrial activity, concrete block manufacturing, will take place in the Manufacturing Building. The Proposed Project can produce a maximum of 126 tons of block per hour, 2,520 tons per day (tpd), and 756,000 tons per year (tpy).

Potential impacts to each resource area have been assessed and discussed in the California Environmental Quality Act (CEQA) Initial Study (IS). Based on the analysis conducted and discussed within, the Proposed Project may have potentially significant impacts to Air Quality, Biological Resources, and Transportation/Traffic unless mitigated. In order to reduce these impacts to less than significant levels, Angelus proposed the following mitigation measures:

- AQ-1: Purchase and utilize forklifts and portable equipment that meets or exceeds Tier 4 Final emission standards

- AQ-2: Utilize Tier 4 construction equipment where available

- BIO-1: Maintain the DSFLF Conservation Area and adhere to the established Incidental Take Permit and Implementation Agreement

- TRA-1: Development Impact Fee for Intersection and Roadway Improvements

After mitigation, impacts to each resource area from the Proposed Project would be less than significant.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF APPENDICES

LIST OF ACRONYMS

°F	degrees Fahrenheit
μg/m^3	micrograms per cubic meter
AB	Assembly Bill
ADA	Americans with Disabilities Act
AEP	Association of Environmental Professionals
AMSP	Agua Mansa Specific Plan
Angelus	Angelus Block, Inc.
APN	Assessor's Parcel Number
AQMP	Air Quality Management Plan
AST	aboveground storage tank
AVL	Automatic Vehicle Location
BMP	Best Management Practice
CAAQS	California Ambient Air Quality Standards
CalGEM	California Geologic Energy Management Division
CARB	California Air Resources Board
CBC	California Building Code
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CERS	California Environmental Reporting System
CFD	Colton Fire Department
CFR	Code of Federal Regulations
CGS	California Geological Survey
CH_4	methane
CHRIS	California Historical Resources Information System
City	City of Rialto
CMP	Congestion Management Program
CMU	concrete masonry units
CNEL	Community Noise Equivalent Level
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
CPUC	California Public Utilities Commission
CUPA	Certified Unified Program Agency
CWA	Clean Water Act
DOT	Department of Transportation
DPM	diesel particulate matter
DSFLF	Delhi Sands flower-loving fly
DTSC	Department of Toxic Substances Control
FHSZ	Fire Hazard Severity Zone
FHWA	Federal Highway Administration
ft	feet or foot
FUWC	Fontana Union Water Company
GHG	greenhouse gas
H_2S	hydrogen sulfide
HCM	Highway Capacity Manual
HI	Hazard Index

HMBP	Hazardous Materials Business Plan
hr	hour
HRA	Health Risk Assessment
Hz	Hertz
IGP	Industrial General Permit
In/sec	inches per second
kWh	kilowatt-hours
lbs or lb	pounds
LID	Low Impact Development
LOS	Level of Service
LSTs	Localized Significance Thresholds
MEIR	Maximum Exposed Individual Resident
MEIW	Maximum Exposed Individual Worker
MIP	Monitoring Implementation Program
mmBtu	million British thermal units
MRZ	mineral resource zone
MT/yr	metric tonnes per year
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NEC	No Exposure Certification
NO_2	nitrogen dioxide
NOI	Notice of Intent
NONA	Notice of Non-Applicability
NOx	oxides of nitrogen
NPDES	National Pollutant Discharge Elimination System
PM_{10}	particulate matter with aerodynamic diameter of 10 microns or less
$PM_{2.5}$	particulate matter with aerodynamic diameter of 2.5 microns or less
POL	petroleum, oil, and lubricant
PPD	Precise Plan of Design
ppm	parts per million
PPV	peak particle velocity
PTC	Permit to Construct
PTO	Permit to Operate
QISP	Qualified Industrial Stormwater Practitioner
RCNM	Roadway Construction Noise Model
RFD	Rialto Fire Department
RMS	root mean square
RPD	Rialto Police Department
RWS	Rialto Water Services
SBCTA	San Bernardino County Transportation Authority
SCAQMD	South Coast Air Quality Management District
SCE	Southern California Edison
SIC	Standard Industrial Classification
SMARA	Surface Mining and Reclamation Act of 1975
SMARTS	Stormwater Multiple Application and Report Tracking System
SO_2	sulfur dioxide
SOx	oxides of sulfur
SPCC	Spill Prevention, Control, and Countermeasure

SSC	species of special concern
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TACs	Toxic Air Contaminants
TIA	Traffic Impact Analysis
TMDL	Total Maximum Daily Load
tpd	tons per day
tpy	tons per year
UMWP	Urban Water Management Plan
US	United States
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VMT	vehicle miles traveled
VOC	volatile organic compound
WQMP	Water Quality Management Plan
WVWD	West Valley Water District

1.0 INTRODUCTION

Angelus Block Co Inc., further referred to in this document as “Angelus,” proposed to construct and operate a new concrete block manufacturing facility in Rialto, California. The proposed new facility will be further referred to as the “Proposed Project.” The Proposed Project will occupy approximately 32 acres of land located at the terminus of Fortuna Way approximate 700 feet east of Riverside Avenue, which will be further referred to as the “Project Site.”

Project Title:

Angelus Block Co. Inc. Concrete Block Manufacturing Facility

Lead Agency Name and Address:

City of Rialto (further referred to as “the City” or “City”)
150 S. Palm Avenue
Rialto, CA 92376

Master Case Number:

2020-0012

Precise of Plan Design (PPD) Number:

2020-0011

Contact Person:

Edgar Gonzalez
Assistant Planner
909.820.2525
egonzalez@rialtoca.gov

1.1 PROJECT SETTING

The Project Site is located at the terminus of Fortuna Way approximately 700 feet east of Riverside Avenue. The Project Sites consists of Assessor’s Parcel Numbers (APNs) 0260-061-41, 0260-061-42, and 0260-061-67 and is located within the Heavy Industrial (H-IND) zone of the Agua Mansa Industrial Corridor (City, 1986) and the General Industry (GI) zone of the 2010 City of Rialto General Plan (City, 2010). The surrounding area is predominantly industrial, commercial, and vacant land zoned for industrial use. The Agua Mansa Pioneer Cemetery is adjacent to the Project Site to the southeast. The Project Site is approximately 2 miles south of Interstate 10 (“I-10”) and approximately 3.5 miles north, northwest of the junction of California State Routes 60 (“CA-60”) and 91 (“CA-91”). The Santa Ana River is located approximately two-thirds of a mile to the east of the Project Site. The nearest residential community is located approximately two-thirds of a mile to the northwest of the Project Site. However, there is one home located on Agua Mansa Road approximately 500 feet east of the Project Site. The nearest school, Crestmore Elementary at 18870 Jurupa Ave, Bloomington, CA, is located approximately 1.6 miles to the west of the Project Site. A Site Vicinity Map is provided as Figure 1, and the Project Site boundary is shown in Figure 2.

1.2 EXISTING CONDITIONS

The Project Site has been owned and maintained by Angelus since the late 1990's. Currently, the Project Site consists of an active Recycle Plant, paved product storage, unpaved product storage, and unused space. There is one entrance to the Project Site via one gate at the Terminus of Fortuna Way. The unpaved storage areas are used for the storage of miscellaneous products, materials, and equipment from Angelus' various facilities in the area. The paved storage area is used to store finished paver products from the nearby Angelus Rialto Paver Plant located at 3435 South Riverside Avenue, Bloomington, CA 92316. This paved storage area can be accessed from the Project Site via a ramp at the south side of the Project Site.

The existing Recycle Plant accepts discarded product from Angelus' various products in the area. The material is stockpile, wetted for dust control, loaded into a hopper using a front-end loader, and crushed. To provide dust control, a sprinkler system is used to wet the material prior to transfer into the hopper. The resulting material is conveyed and stockpiled and then transferred to the existing 3435 Riverside Avenue paver plant for reuse. The existing Recycle Plant operates under South Coast Air Quality Management District (SCAQMD) Permit to Operate (PTO) F92562, which limits operation of the Recycle Plant to a maximum of 65,500 tons of material per month.

The E.Z. Mix and Angelus Paver Plant facilities are located to the southwest of the Project Site. The Agua Mansa Properties, Inc. facility, an active construction debris landfill, is located directly north of the Project Site. The West Riverside Canal, one residence, and Agua Mansa Road lie to the east of the Project Site. The Agua Mansa Power Plant and Colton/San Bernardino water treatment and infiltration facility are located on the east side of Agua Mansa Road. The Agua Mansa Pioneer Cemetery is located to the south of the Project Site. A West Valley Water District extraction well and supporting infrastructure are located in the southeast corner of the facility. This facility is not part of the Angelus property.

The area to the northwest of the Project Site is the 30.5-acre habitat conservation area. This "Conservation Area" was set aside in the 1999 Habitat Conservation Plan established for the development of the area that includes the Project Site (Michael Brandman Associates, 1999). This Habitat Conservation Plan and associated Federal Fish and Wildlife Permit have been provided as Appendix A.

1.3 PROJECT DESCRIPTION

The Proposed Project involves the construction and operation of a new concrete block manufacturing facility. In general, the concrete block manufacturing process includes raw material delivery and storage; material transfer and mixing; product forming, curing, and finishing; and product storage, onsite movement, packaging, and shipment to customers. Finished products include a wide variety of CMUs that provide structural strength and aesthetic facades for buildings constructed throughout California.

1.3.1 Location and Site Layout

The Proposed Project will occupy approximately 32 acres of land located at the terminus of Fortuna Way approximately 700 feet east of Riverside Avenue. A Site Vicinity Map is provided as Figure 1, and the Project Site boundary is shown in Figure 2. Once operational, the Project Site will include the following structures:

Table INT-1: Proposed Structures

Structure	Stories	Max Height (ft)	Building Area (square feet)
Manufacturing Plant Building	1	57.0	135,581
Admin Building	2	38.0	11,072
Industrial Building (Mechanic Shop and Warehouse)	1	31.0	21,360
Metal Canopy Structure	1	29.5	21,534

In addition to the structures above, the Project Site will include one ~4,000-gallon diesel aboveground storage tank (AST) with one fuel dispenser. The entire Project Site will be paved with interlocking, pervious concrete pavers except for structure footprints. There will be two gates at the terminus of Fortuna Way: one one-way entrance gate and one one-way exit gate. The gates will be opened and locked manually. A Site Plan is provided as Figure 3.

1.3.2 Construction

Construction of the Proposed Project is expected to commence on approximately April 1st, 2021 and continue for approximately 18 months. Construction will include site preparation, grading, building construction, and paving. There are no existing structures on the Project Site. Therefore, demolition will not be required. A ramp connecting the Project Site and the existing facility to the south will be constructed during the Building Construction and Paving phases. Construction activities will occur between 06:00 and 19:00 Monday through Saturday. Anticipated construction schedule and equipment for each phase are summarized in the following table.

Table INT-2: Construction Schedule and Equipment

Phase	Duration	Expected Equipment
Site Preparation	1 Month	Tractors/Loaders/backhoes, dozers
Grading	2 Month	Graders, dozers, tractors/loaders/ backhoes, excavators
Building Construction	12 Months	Cranes, lifts, tractors/loaders/backhoes, welders, generator sets
Paving	2 Months	Pavers, rollers, tractors/loaders/backhoes, cement mixers, and other paving equipment
Finishing/Architectural Coating	1 Month	Air Compressors

The entire site will be graded and repaved using pervious interlocking pavers. Approximately 10,000 cubic yards of material will need to be imported or exported during grading. A water truck will be utilized for dust control during grading. Water will be obtained from West Valley Water District, and approximately 20,000 gallons of water will be used per day.

The maximum amount of construction workers will be 75 per shift. Construction workers will park on Fortuna Way and Industrial Drive. Improvements to public roadways are not included as part of the Proposed Project. The only changes to existing roadways will be minor improvements to the terminus of Fortuna Way to accommodate the new Project Site entrance.

1.3.3 Operations

Once operational, the Proposed Project will include the Manufacturing Building, Admin Building, Industrial/Shop Building, Storage Warehouse Building, Metal Canopy Structure, a parking lot, and product and material storage areas. The Project Site layout is provided in Figure 3.

The normal operating schedule for the Proposed Project will be 18 hours per day, 5 days per week, and 52 weeks per year, and the maximum operating schedule will be 20 hours per day, 6 days per week, and 52 weeks per year. Typical operating hours for the Project Site will be from 04:00 to 22:00.

The primary industrial activity, concrete block manufacturing, will take place in the Manufacturing Building. The Manufacturing Building contains two identical but mirrored plants: Concrete Block Plant #1 and Concrete Block Plant #2. Each block plant has a separate set of drive-over raw material hoppers. Trucks drive over the steel grate and unload material, including sand, gravel, and cinder into the hoppers. Each Plant contains two process lines. Each Line contains a separate block manufacturing process, which consists of batching, mixing, block formation, and curing. Each curing chamber will operate at approximately 140 degrees Fahrenheit (°F). The chambers will be heated using one centralized natural gas burner with heat input capacity up to 3 million British thermal units (mmBtu) per hour (hr). Each Line also includes two silos, which are pneumatically loaded and contain cement or fly ash. Therefore, the Manufacturing Building will contain a total of 8 silos. Each silo will have a maximum capacity of 75 tons. Total maximum annual throughput is expected to be approximately 79,000 tpy and 39,500 tpy for cement and fly ash, respectively. The Manufacturing Building also includes offices, conference rooms, locker rooms, an oil and waste storage area and a parts storage room.

After curing within the Manufacturing Building, some blocks are complete and are moved to on-site product storage and other blocks are moved to on-site storage areas to finish curing outdoors. Depending on the style, a block may be split, burnished, or shot blasted in order to achieve the desired aesthetic finish. The finished blocks are palettized and shipped to customers via truck. The Proposed Project can produce a maximum of 126 tons of block per hour, 2,520 tpd, and 756,000 tpy.

The Industrial Building includes a mechanic shop with equipment service bays and a warehouse. Once operational, the mechanic shop will be used to perform maintenance for on-site vehicles and equipment including forklifts. Additional uses for this building include parts cleaning, machining, and waste storage. The warehouse will be used for storing finished products.

The Metal Canopy Structure will be used for shot blasting, burnishing, and other miscellaneous block finishing purposes. The Storage Warehouse Building will be used for storing finished products. The Admin Building is a two-story office building with typical office amenities including offices, cubicles, conference rooms, bathrooms, reception, etc. The parking lot will be located adjacent to the Admin Building and will contain 40 parking spaces, including 2 Americans with Disabilities Act (ADA) designated spaces.

The diesel AST will be located near the metal canopy structure. The AST will be equipped with one fuel dispenser and will be periodically refilled by tanker truck deliveries. The throughput of the AST is expected to be less than or equal to 120,000 gallons of diesel fuel per year.

Pallets of blocks are moved throughout the facility and loaded onto trucks using forklifts. The Proposed Project will utilize up to 12 forklifts. The Proposed Project will also utilize one front-end loader to move materials and up to three portable engines (generator sets, welders, compressors, etc.).

Table INT-3: Off-road and Portable Equipment

Equipment Type	Quantity	Fuel Type	Model Equivalent
Forklifts	12	Diesel	Hyster H155
Loaders	1	Diesel	Hyundai 757-9A
Portable Engines	3	Various	Caterpillar XQ35

As product will be stored throughout the facility, forklifts and loaders are expected to travel throughout the Project Site. Similarly, the portable engines may be used at any location within the Project Site. Onsite equipment maintenance will be performed on the Industrial/Shop Building.

The Proposed Project proposes to import raw materials and ship finished products via trucks. The Proposed Project would generate a maximum of 250 truck trips per day and approximately 187 truck trips on a typical day. Onsite, trucks will enter the Project Site via the project entrance and follow the designated truck routes (See Figure 4). Trucks visiting the site will travel approximately 0.6 miles per trip.

On a typical day, the Proposed Project will require approximately 50 full time employees per shift. The Proposed Project will require a maximum of 70 full-time employees and 5 part-time employees per shift. Shift change will occur at approximately noon each day.

The Project Site will be lighted at night for operational and security reasons. Light fixtures will be placed on the sides of buildings and aimed downward. Total electricity consumption of the Proposed Project is expected to be approximately 6,000 kilowatt-hours (kWh) per day. Total water usage for the Proposed Project is expected to be approximately 9 acre-feet per year.

1.4 REQUIRED PERMITS

The City is the Lead Agency under CEQA and is responsible for review and approval of this Initial Study. The City is also response for reviewing and approving the following items:

- Precise Plan of Design
- Conditional Development Permit
- Lot Line Adjustment/Lot Merger

The PPD, which was submitted on February 24, 2020, included a site plan, floor plans, roof plans, elevation plans, conceptual grading plan, preliminary Water Quality Management Plan (WQMP), and a color and materials board. Additional materials were requested from the City, including but not limited to, a landscape plan, a lighting plan, and a Will Serve Letter from West Valley Water District.

Additional permits, such as building permits and permits for new utility connections, may be required upon review of construction documents. These additional permits are considered ministerial, and thus issuance of these permits would not trigger the need to further comply with CEQA.

The Proposed Project will be subject to various environmental regulations and may require the following permits:

- Permit to Construct (PTC)/PTO – SCAQMD
- Hazardous Materials/Hazardous Waste Permit – California Certified Unified Program Agency (CUPA): San Bernardino County Fire Department Hazardous Materials Division
- Coverage under the Stormwater Industrial General Permit – Santa Ana Regional Water Quality Control Board

2.0 ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a “Potentially Significant Impact” or “Less Than Significant Impact with Mitigation Incorporated” as indicated by the checklist on the following pages.

☐ Aesthetics
☐ Agricultural and Forestry Resources
☒ Air Quality
☒ Biological Resources
☐ Cultural Resources
☐ Geology/Soils
☐ Greenhouse Gas Emissions
☐ Hazards and Hazardous Materials
☐ Hydrology/Water Quality
☐ Land Use/Planning
☐ Mineral Resources
☐ Noise
☐ Population/Housing
☐ Public Services
☐ Recreation
☒ Transportation/Traffic
☐ Tribal Cultural Resources
☐ Utilities/Service Systems
☐ Mandatory Findings of Significance

3.0 DETERMINATION

On the basis of this evaluation:

☐ I find that the proposed Project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☒ I find that although the proposed Project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the proposed Project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required. I find that the proposed Project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed Project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed Project, nothing further is required.

☐ I find that although the proposed Project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, (b) none of the conditions described in Guidelines Section 15162 for a Subsequent EIR or Section 15163 for a Supplemental EIR have occurred and (c) only minor technical changes or additions to the previous environmental documents are necessary.

4.0 ENVIRONMENTAL EVALUATION

This section evaluates potential environmental impacts of the Proposed Project following the environmental checklist contained in the State CEQA Guidelines, Appendix G. The definitions of the response column headings are as follows:

- "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant after the implementation of feasible mitigation measures.
- "Less than Significant After Mitigation" applies where the incorporation of mitigation measure has reduced an effect from a "Potentially Significant Impact" to a "Less Than Significant Impact."
- "Less Than Significant Impact" applies where the project creates no significant impacts, only Less than Significant Impacts.
- "No Impact" applies where the project does not create an impact in that category.

4.1 AESTHETICS

Checklist Item	Potentially Significant Impact	Less Than Significant After Mitigation	Less than Significant Impact	No Impact
Would the project…				
a. Have a substantial adverse effect on a scenic vista?	☐	☐	☒	☐
b. Substantially damage scenic resources, including, but not limited to trees, rock outcroppings, and historic buildings within a State-designated scenic highway?	☐	☐	☐	☒
c. Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☒	☐
d. Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☒	☐

4.1.1 Discussion:

a. Would the project have substantial adverse effect on a scenic vista? **Less than Significant Impact.**

The Project Site is located within the Agua Mansa Corridor, which itself is located in the eastern portion of the Upper Santa Ana Valley adjacent to the Santa Ana River. According to the Agua Mansa Specific Plan, the major natural topographical features of the area are Slover Mountain, the bluff along Agua Mansa Road overlooking the Santa Ana River flood plain, and the small mountains of the Crestmore Quarry site. It is vital to note that much of the land within the Agua Mansa Corridor are currently mining sites or were previously mined and the majority of land has been utilized for industrial uses. A very small portion of the land within the Agua Mansa Corridor remains in a natural condition.

The Project Site has been owned and maintained by Angelus for over 30 years. At present, approximately half of the Project Site is unpaved land consisting of primarily non-native vegetation. The remaining area covered by the Project Site consists of an active Recycle Plant, paved product storage, and unpaved product storage.

Angelus proposes construction of a new concrete block manufacturing facility at the Project Site. Once operational, the Manufacturing Plant Building will stand as the tallest structure at 57 feet in height. Construction of the manufacturing facility will convert the Project Site into an industrial facility consistent with the Agua Mansa Specific Plan (AMSP) and adjacent land uses. In addition to the Recycle Plant, the E.Z. Mix and Angelus Paver Plant facilities are located southwest of the Project Site. The Agua Mansa Properties, Inc. facility operates as a construction debris landfill directly north of the Project Site. Located east of the Project Site are the West Riverside Canal, a residence, and Agua Mansa Road. The Agua Mansa Power

Plant and Colton/San Bernardino water treatment and infiltration facility are located on the east side of Agua Mansa Road. Directly south and east of the power plant are multiple warehousing operations including Wal-Mart, Sam's Club, Mattress Firm, and CHEP North America Operations Center. The Agua Mansa Pioneer Cemetery is located to the south of the Project Site. Northwest of the Project Site is a 30.5-acre habitat conservation area. None of the areas described, including the Project Site, contain landforms that would be considered a scenic resource.

The City of Rialto General Plan (General Plan) prepared in December 2010 designates the Project Site for general industrial use. The General Plan states one goal and two policies pertinent to scenic vistas:

> *Goal 2-14: Protect scenic vistas and scenic resources.*
>
> *Policy 2-14.1: Protect views of the San Gabriel and San Bernardino Mountains by ensuring that building heights are consistent with the scale of surrounding, existing development.*
>
> *Policy 2-14.2: Protect views of the La Loma Hills, Jurupa Hills, Box Spring Mountains, Moreno Valley, and Riverside by ensuring that building heights are consistent with the scale of surrounding, existing development.*

The Project Site is located within an industrial area that consists of industrial and commercial buildings of heights varying from 20 to more than 60 feet tall. As stated above, the tallest structure at the Project Site will stand approximately 57 feet tall, which is consistent with the scale of surrounding, existing development. Therefore, the project complies with the City of Rialto's policies regarding scenic vistas, and impacts will be less than significant. No mitigation is required.

b. Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings and historic buildings within a state scenic highway? No Impact.

The California Department of Transportation (DOT) manages the State Scenic Highway Program and has the authority to officially designate scenic highways in California. According to the DOT, there are no state scenic highways in the vicinity of the Project Site (Caltrans, 2020). The majority of the Project Site is cleared, unpaved land and there are no historic buildings on the Project Site. The northern portion of site contains sparse vegetation but there are no trees of rock outcroppings present at the site. The southern portion of the site consists of an active Recycle Plant and product storage. The Project Site does not contain scenic resources; therefore, the Proposed Project will have no impact to scenic resources within a state scenic highway. No mitigation is required.

c. Substantially degrade the existing visual character or quality of the site and its surroundings? Less than Significant Impact.

The Project Site is located within the Agua Mansa Industrial Corridor, more specifically development sub-area 8 (Sub-Area 8). According to the AMSP, Sub-Area 8 consists of a variety of land uses, including industrial, resource extraction, vacant mined areas, a sewage treatment plant, and some single-family residences along Agua Mansa Road.

The Proposed Project would develop predominantly unpaved land into a new concrete block manufacturing facility, which would inherently alter the appearance of the site. The aesthetic appearance of the completed and operational Project Site would align with the scale of existing, surrounding development. As a result, the visual appearance of the completed Project Site will be consistent with the surrounding businesses and land uses, therefore the Proposed Project will have a less than significant impact on the existing visual character or quality of the site and its surroundings. No mitigation is required.

d. Create a new source of substantial light or glare that would adversely affect day or night-time views in the area? Less than Significant Impact.

The Project Site is situated in a developed area surrounded by industrial facilities that provide existing sources of light and glare consistent with urban areas. Sources of light and glare on days with little cloud cover include vehicle windshields and windows on buildings. Surrounding buildings, businesses, streets, intersections, vehicles, etc. are existing sources of night-time light and glare. The Proposed Project will comply with the City of Rialto Municipal Code Section 18.61.140 (City of Rialto, 2019). The Proposed Project will provide exterior lighting to illuminate on-site areas such as entrances, exits, parking, loading, shipping, and receiving, pathways, and other work areas of the site for security and safety. All lighting will be designed as an integral part of the overall site and building design as well as to avoid spill over glare beyond the site boundaries. The light fixtures and their structural supports will be designed to be architecturally compatible with buildings. The Project Site will be lighted at night for operational and security reasons. Light fixtures will be placed on the sides of buildings and aimed downward to reduce the potential for light to spill over the property. The street address located at the front of the Proposed Project will be illuminated to facilitate location of the facility. The General Plan states one policy pertinent to glare:

Policy 2-14.3: Ensure use of building materials that do not produce glare, such as polished metals or reflective windows.

The Proposed Project will not be constructed using building materials that produce substantial new sources of glare, such as reflective glass or polished metals. Potential to cause glare will be taken into consideration when installing lighting at the site. The entire Project Site will be paved with interlocking pervious concrete pavers except for structure footprints and the northeast corner of the site. Neither concrete pavers nor dirt has potential to cause glare during daylight hours and will not reflect light at night.

Furthermore, the Project Site is not located on any major road or thoroughfares. The main entrance to the site will be through Fortuna Way. The Manufacturing Plant Building will be located in the center of the Project Site, decreasing the amount of light and glare that would spill over past the property line. The Proposed Project is located 300 feet away from Agua Mansa Road and there are topographic features between the Project Site and the roadway. Therefore, the Proposed Project will have little to no impact on the amount of light and glare along Agua Mansa Road. Therefore, the Proposed Project will have a less than significant impact on the introduction of new sources of light or glare that would adversely affect day or night-time views in the area.

4.1.2 Cumulative Impacts

Potential impacts related to scenic views and aesthetics are generally site specific. Project-related impacts to scenic vistas and the general visual character of the site are less than significant, and there are no potential impacts to on-site visual resources because there are none. Lighting and potential sources of glare are not always project specific, but the Proposed Project is consistent with existing, surrounding development and would be consistent with the City's applicable lighting regulations. The Proposed Project in addition to past, present, and reasonably foreseeable future development would affect the appearance of the site and surrounding area. However, all development would adhere to applicable policies and limitations regarding lighting and scenic vistas. Therefore, aesthetic impacts are not expected to be cumulatively considerable and impacts would be less than significant.

4.2 AGRICULTURE / FORESTRY RESOURCES

Checklist Item	Potentially Significant Impact	Less Than Significant After Mitigation	Less than Significant Impact	No Impact
Would the project…				
a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland) as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
b. Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c. Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resource Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☒
d. Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒

4.2.1 Discussion

a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland) as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use? **No Impact.**

The Proposed Project is not situated on or proximate to land that is designated as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (California Department of Conservation, 2019a). The parcel of land on which the Proposed Site sits has been owned and maintained by Angelus since the 1990's. No part of the Project Site has been used for agricultural uses during that time. Agricultural land uses within the Agua Mansa Corridor are primarily concentrated in areas east of Agua Mansa Road in the Santa Ana River flood plain. The Project Site is not located within the flood plain and is situated west of Agua Mansa Road. Therefore, the Proposed Project would have no impact on the conversion of designated agricultural land to non-agricultural use. No mitigation is required.

b. Conflict with existing zoning for agricultural use, or a Williamson Act contract? **No Impact.**

The Proposed Project is not zoned for agricultural use and is not under a Williamson Act contract. The Project Site is situated land that is designated for industrial uses. Therefore, the Proposed Project would not conflict and have no impact on existing zoning or the Williamson Act contract. No mitigation is required.

c. Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resource Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))? No Impact.

   The Project Site is situated on land that is not zoned for forest land, timberland, or timberland zoned Timberland Production. The area is zoned for industrial use, therefore the Proposed Project would not conflict and have no impact on existing zoning. No mitigation is required.

d. Result in the loss of forest land or conversion of forest land to non-forest use? No Impact.

   The Project Site is located primarily on unpaved land that has been cleared for industrial use and does not contain any designated forest land. Therefore, the Proposed Project would have no impact on conversion to non-forest use. No mitigation is required.

e. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use? No Impact.

   The Project Site does not consist of any land designated for forest or agricultural use. Therefore, the Proposed Project would have no impact on converting the existing land use. No mitigation is required.

4.2.2 Cumulative Impacts

The Proposed Project is zoned for industrial uses under the Agua Mansa Specific Plan and is therefore not located on or near agricultural or forest land. The Proposed Project is consistent with existing, surrounding development and adheres with all applicable agricultural and forestry regulations. The Proposed Project, in addition to past, present, and reasonably foreseeable development would not interfere with existing zoning of agricultural or forest land. Therefore, there are no cumulative impacts expected from the Proposed Project plus foreseeable development on Agriculture and Forest Resources. No mitigation is required.

4.3 AIR QUALITY

Checklist Item	Potentially Significant Impact	Less Than Significant After Mitigation	Less than Significant Impact	No Impact
Would the project…				
a. Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐
b. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?	☐	☒	☐	☐
c. Expose sensitive receptors to substantial pollutant concentrations?	☐	☒	☐	☐
d. Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	☐	☐	☒	☐

4.3.1 Discussion

a. Conflict with or obstruct implementation of the applicable air quality plan?

The Proposed Project is located within the SCAQMD, which has primary authority over stationary sources of air pollution within its jurisdiction. SCAQMD developed the 2016 Air Quality Management Plan (AQMP), which provides the blueprint for regulatory development with the goal of getting the South Coast Air Basin into attainment of the National Ambient Air Quality Standards (NAAQS). In order to achieve the goals of the 2016 AQMP, SCAQMD has established a set of Rules and Regulations that each source of emissions within the basin must adhere to.

Prior to construction of the Proposed Project, Angelus must submit an application for and obtain a PTC. As part of the application process, Angelus must show that the Proposed Project will comply with each applicable SCAQMD regulation. Once a PTC is obtained, Angelus can begin construction. Once the facility is operational, SCAQMD will confirm that the operational facility meets each regulation as planned and will issue a PTO. Conditions of the facility's PTOs include operating, recordkeeping, and reporting requirements that will ensure compliance with each applicable regulation. In complying with its PTOs, the Proposed Project will be incompliance with the AQMP.

In addition to SCAQMD requirements, the Proposed Project must comply with regulations set forth by the California Air Resources Board (CARB) and the United States Environmental Protection Agency (USEPA). Angelus is currently subject to CARB's In-Use Diesel Off-Road Regulation, which requires fleet owners to gradually phase out older off-road equipment and replace it with newer, cleaner models. The loader and forklifts to be used by the Proposed Project will be subject to this regulation. Angelus will purchase and utilize equipment that keeps Angelus' state-wide fleet in compliance.

The Proposed Project will comply with the applicable air quality regulations, which were established to align with the applicable air quality plans. Therefore, the Proposed Project will not conflict with any applicable air quality plan, and impacts will be less than significant. No mitigation required.

b. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?

The South Coast Air Basin is currently in non-attainment of multiple NAAQS and California Ambient Air Quality Standards (CAAQS). The basin's attainment status for each regulated pollutant is summarized in the following Table.

Table AQ-1: South Coast Air Basin Attainment Status

Criteria Pollutant	Standard	Averaging Time	Designation	Attainment Date
1-Hour Ozone	NAAQS	1979 1-Hour (0.12 ppm)	Nonattainment (Extreme)	2/6/2023
	CAAQS	1-Hour (0.09 ppm)	Nonattainment	N/A
8-Hour Ozone	NAAQS	1997 8-Hour (0.08 ppm)	Nonattainment (Extreme)	6/15/2024
	NAAQS	2008 8-Hour (0.075 ppm)	Nonattainment (Extreme)	7/20/2032
	NAAQS	8-Hour (0.070 ppm)	Nonattainment (Extreme)	8/3/2038
	CAAQS	8-Hour (0.070 ppm)	Nonattainment	Beyond 2032
CO	NAAQS	1-Hour (35 ppm) 8-Hour (9 ppm)	Attainment (Maintenance)	6/11/2007
	CAAQS	1-Hour (20 ppm) 8-Hour (9 ppm)	Attainment	6/11/2007
NO_2	NAAQS	1-Hour (0.10 ppm)	Unclassifiable/ Attainment	N/A
	NAAQS	Annual (0.053 ppm)	Attainment (Maintenance)	9/22/1998
	CAAQS	1-Hour (0.18 ppm) Annual (0.030 ppm)	Attainment	--
SO2	NAAQS	1-Hour (75 ppm)	Designations Pending (expect Uncl./ Attainment)	N/A
	NAAQS	24-Hour (0.14 ppm) Annual (0.03 ppm)	Unclassafiable/ Attainment	3/19/1979
PM_{10}	NAAQS	1987 24-Hour	Attainment (Maintenance)	7/26/2013
	CAAQS	24-Hour (50 µg/m^3) Annual (20 µg/m^3)	Nonattainment	N/A

Criteria Pollutant	Standard	Averaging Time	Designation	Attainment Date
$PM_{2.5}$	NAAQS	2006 24-Hour (35 µg/m^3)	Nonattainment (Serious)	12/31/2019
	NAAQS	1997 Annual (15.0 µg/m^3)	Attainment	8/24/2016
	NAAQS	2012 Annual (12.0 µg/m^3)	Nonattainment (Serious)	12/31/2025
	CAAQS	Annual (12 µg/m^3)	Nonattainment	N/A
Lead	NAAQS	3-Months Rolling (0.15 µg/m^3)	Nonattainment (Partial)	12/31/2015
H_2S	CAAQS	1-Hour (0.03 ppm/42 µg/m^3)	Attainment	--
Sulfates	CAAQS	24-Hour (25 µg/m^3)	Attainment	--
Vinyl Chloride	CAAQS	24-Hour (0.01 ppm/26 µg/m^3)	Attainment	--

1. *Source = http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/naaqs-caaqs-feb2016.pdf*
2. *CO = carbon monoxide, NO_2 = nitrogen dioxide, SO_2 = sulfur dioxide, PM_{10} = particulate matter with aerodynamic diameter of 10 microns or less, $PM_{2.5}$ = particulate matter with aerodynamic diameter of 2.5 microns or less, H_2S = hydrogen sulfide.*
3. *ppm = parts per million, µg/m^3 = micrograms per cubic meter*

SCAQMD has established a set of CEQA Significance Thresholds. If a project's emissions exceed these significance thresholds, then the project would have a cumulatively considerable net increase of a criteria pollutant for which the region is in non-attainment. The SCAQMD Significance Thresholds are summarized in the following table.

Table AQ-2: SCAQMD Significance Thresholds

Mass Daily Thresholds		
Pollutant	Construction	Operation
NOx	100 lbs/day	55 lbs/day
VOC	75 lbs/day	55 lbs/day
PM_{10}	150 lbs/day	150 lbs/day
$PM_{2.5}$	55 lbs/day	55 lbs/day
SOx	150 lbs/day	150 lbs/day
CO	550 lbs/day	550 lbs/day
Lead	3 lbs/day	3 lbs/day
Toxic Air Contaminants (TACs), Odor, and GHG Thresholds		
TACs	Maximum Incremental Cancer Risk ≥10 in one million Cancer Burden > 0.5 excess cancer cases (in areas ≥ 1 in one million) Chronic & Acute Hazard Index (HI) ≥ 1.0	
Odor	Project creates an odor nuisance pursuant to South Coast AQMD Rule 402	
GHG	10,000 MT/yr CO_2e for industrial facilities	

Ambient Air Quality Standards for Criteria Pollutants		
NO_2 1-Hour Average Annual Arithmetic Mean	South Coast AQMD is in attainment; project is significant if it causes or contributes to an exceedance of the following attainment standards: 0.18 ppm (state) 0.03 ppm (state) and 0.0534 ppm (federal)	
PM_{10} 24-Hour Average Annual Average	10.4 μg/m^3 1.0 μg/m^3	2.5 μg/m^3 1.0 μg/m^3
$PM_{2.5}$ 24-Hour Average	10.4 μg/m^3	2.5 μg/m^3
SO_2 1-Hour Average 24-Hour Average	0.25 ppm (state) and 0.075 ppm (federal–99th percentile) 0.04 ppm (state)	
Sulfate 24-Hour Average	25 μg/m^3 (state)	
CO 1-Hour Average 8-Hour Average	South Coast AQMD is in attainment; project is significant if it causes or contributes to an exceedance of the following attainment standards: 20 ppm (state) and 35 ppm (federal) 9.0 ppm (state/federal)	
Lead 30-day Average Rolling 3-Month Average	1.5 μg/m^3 (state) 0.15 μg/m^3 (federal)	

1. *Source = http://www.aqmd.gov/docs/default-source/ceqa/handbook/scaqmd-air-quality-significance-thresholds.pdf*
2. *NOx = oxides of nitrogen, VOC = volatile organic compounds, SOx = oxides of sulfur, GHG = greenhouse gases, CO_2e = carbon dioxide equivalent*
3. *Lbs/day = pounds per day, MT/yr = metric tonnes per year*

Emissions during construction and operation of the Proposed Project were calculated using project specific information, engineering assumptions, and established emissions calculation methodology. A thorough air quality analysis is presented in Appendix B.

Construction emissions for the Proposed Project will be generated by construction equipment, vehicle traffic, and fugitive dust. Construction emissions are summarized in the following table.

Table AQ-3: Construction Emissions Summary

	CO	VOC	NO_X	SO_X	PM_{10}	$PM_{2.5}$
Maximum Daily Emissions (lbs/day)	23.01	57.40	46.52	0.05	10.79	6.63
SCAQMD Significance Thresholds (lbs/day)	550.00	75.00	100.00	150.00	150.00	55.00
Exceedance?	No	No	No	No	No	No

Operation emissions for the Proposed Project will be generated by the concrete block manufacturing processes, silo loading, diesel fuel storage, truck travel, employee vehicles, and off-road equipment (forklifts, loader, etc.). Operation emissions are summarized in the following table.

Table AQ-4: Unmitigated Operational Emissions Summary (lb/day)

	CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$	Lead
Concrete Block Manufacturing	2.45	0.49	2.59	0.04	10.36	2.17	--
Cement and Fly Ash Storage	--	--	--	--	0.70	0.53	3.55E-05
Diesel Storage	--	0.01	--	--	--	--	--
Trucks	5.82	0.93	36.23	0.14	15.78	4.33	--
Employee Commute	4.20	0.07	0.25	0.01	0.79	0.24	--
Off-Road Equipment	45.70	4.07	36.13	0.06	2.26	2.08	--
Proposed Project Total	58.18	5.57	75.20	0.26	29.89	9.34	3.55E-05
Existing Emissions	5.28	0.27	3.31	0.02	1.32	0.36	--
Net Increase	52.90	5.30	71.89	0.24	28.57	8.98	3.55E-05
SCAQMD Threshold	550.00	55.00	55.00	150.00	150.00	55.00	3.00
Exceedance?	No	No	**Yes**	No	No	No	No

As shown in Table AQ-4, the Proposed Project's emissions of NOx will exceed the SCAQMD Significance Thresholds without mitigation. In order to reduce emissions and mitigate this impact, Angelus proposes to purchase and utilize forklifts and portable equipment (e.g. generators) that meet or exceed Tier 4 Final emission standards. Operation emissions after mitigation are summarized in the following table.

Table AQ-5: Mitigated Operational Emissions Summary (lb/day)

	CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$	Lead
Unmitigated Emissions	58.18	5.57	75.20	0.26	29.89	9.34	3.55E-05
Benefits from Mitigation	0.98	2.15	29.51	0.00	2.08	1.90	--
Existing Emissions	5.28	0.27	3.31	0.02	1.32	0.36	--
Net Increase	51.92	3.15	42.38	0.24	26.49	7.08	3.55E-05
AQMD Threshold	550.00	55.00	55.00	150.00	150.00	55.00	3.00
Exceedance?	No	No	No	No	No	No	No

After mitigation, the emissions from the Proposed Project will be below the applicable Significance Thresholds.

SCAQMD has additional significance thresholds for new projects called Localized Significance Thresholds (LSTs), which compare onsite emissions to mass rate thresholds that depend on geographical location and distance to the nearest receptor. LSTs are generally applicable for projects with areas of 5 acres or less. However, comparing emissions from the Proposed Project to the 5-acre LSTs is conservative as emissions would be spread over a larger area for the Proposed Project vs. a 5-acre site. Plus, the manufacturing building, which will be the area of greatest emissions is located near the center of the facility, away from the fenceline. Onsite emissions from the Proposed Project and a comparison to the applicable LSTs are provided in the tables below.

Table AQ-6: Onsite Construction Emissions Summary

	CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$
Maximum Onsite Daily Emissions (lb/day)	21.52	57.34	42.42	0.04	10.33	6.49
SCAQMD LST Mass Thresholds (lb/day)*	4,142.00	N/A	378.00	N/A	65.00	17.00
Exceedance?	No	N/A	No	N/A	No	No

Table AQ-7: Onsite Operation Emissions Summary

	CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$	Lead
Unmitigated Onsite Emissions	50.89	4.80	44.96	0.11	16.24	5.52	3.55E-05
Benefits from Mitigation	0.98	2.15	29.51	0.00	2.08	1.90	--
Existing Emissions	5.03	0.22	0.91	0.01	0.25	0.08	--
Net Increase (Onsite)	44.88	2.44	14.54	0.11	13.91	3.54	3.55E-05
AQMD LST	4,142	N/A	378	N/A	16.00	5.00	N/A
Exceedance?	No	No	No	No	No	No*	No

** No exceedance after mitigation*

Based on the analysis presented above and in Appendix B, emissions from the Proposed Project would be below applicable significance thresholds after mitigation. Therefore, after mitigation, the Proposed Project would result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment. Impacts will be less than significant after mitigation.

Mitigation Measure AQ-1: Purchase and utilize forklifts and portable equipment that meet or exceed Tier 4 Final emission standards.

c. Expose sensitive receptors to substantial pollutant concentrations?

The Proposed Project would expose sensitive receptors to substantial pollutant concentrations if the Proposed Project would result in health risks in excess of the Significance Thresholds listed in Table AQ-2. A Health Risk Assessment (HRA) for the Proposed Project was performed and methodology and results are presented in Appendix C. The primary TAC generated by the proposed project is diesel particulate matter (DPM). Additional TACs are generated from combustion of natural gas and silo loading operations. Details on TAC emissions can be found in Appendix C.

The mitigation measure proposed to reduce NOx emissions, purchasing and utilizing forklifts and portable equipment that will meet or exceed Tier 4 Final emission standards has a co-benefit of reducing emissions of DPM. The results presented below are based on post-mitigation emissions from the Proposed Project.

Table AQ-8: Operations Cancer Risk Summary

Receptor	Increased Cancer Risk
Maximum Exposed Individual Resident (MEIR)	9.5 in one million
Maximum Exposed Individual Worker (MEIW)	1.8 in one million
SCAQMD Significance Threshold	10 in one million
Exceedance?	No

Table AQ-9: Operations Non-Cancer Chronic Hazard Index Summary

Receptor	Chronic HI
MEIR	0.02
MEIW	0.01
SCAQMD Significance Threshold	1.00
Exceedance?	No

Table AQ-10: Operations Non-Cancer Acute Hazard Index Summary

Receptor	Chronic HI
MEIR	0.002
MEIW	0.002
SCAQMD Significance Threshold	1.00
Exceedance?	No

Although construction is short-term in nature, emissions from construction activities can also expose sensitive receptors to potential health effects. Cancer risks and non-cancer effects from construction emissions are summarized below.

Table AQ-11: Construction Cancer Risk Summary - Unmitigated

Receptor	Increased Cancer Risk
Unmitigated MEIR	27.8 in one million
Unmitigated MEIW	6.8 in one million
SCAQMD Significance Threshold	10 in one million
Exceedance?	Yes

As shown in Table AQ-11, cancer risk due to construction emissions at the MEIR exceeds 10 in one million. Therefore, Angelus proposes a mitigation measure to utilize Tier 4 construction equipment where available to reduce DPM emissions. Mitigated cancer risk from construction emissions is summarized in the Table below.

Table AQ-12: Construction Cancer Risk Summary - Mitigated

Receptor	Increased Cancer Risk
Mitigated MEIR	1.15 in one million
Mitigated MEIW	0.03 in one million
SCAQMD Significance Threshold	10 in one million
Exceedance?	No

Table AQ-13: Construction Non-Cancer Chronic Hazard Index Summary

Receptor	Chronic HI
MEIR	0.02
MEIW	0.03
SCAQMD Significance Threshold	1.00
Exceedance?	No

After mitigation, health effects associated with emissions generated by the Proposed Project would be less than the SCAQMD Significance Thresholds. Therefore, impacts would be less than significant after mitigation.

Mitigation Measure AQ-1: Purchase and utilize forklifts and portable equipment that meets or exceeds Tier 4 Final emission standards.

Mitigation Measure AQ-2: Utilize Tier 4 construction equipment.

d. Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

The primary pollutants from the Proposed Project are particulate matter from the concrete block manufacturing process and diesel exhaust from trucks and off-road equipment. These pollutants are not typically associated with nuisance odors. Therefore, impacts will be less than significant. No mitigation required.

4.3.2 Cumulative Impacts

With the exception of local effects from CO and TACs, air pollution is generally a regional issue. SCAQMD has established its Significance Thresholds to allow for continued development within the region while ensure that impacts from multiple projects do not result in a cumulatively considerable impact. Project-level impacts are below these established significance thresholds. In addition, there are no additional foreseeable projects in the direct vicinity of the projects that would have a cumulative impact to nearby receptors. Therefore, cumulative impacts of the Proposed Project plus foreseeable past, present, and future development are less than significant. No additional mitigation required.

4.4 BIOLOGICAL RESOURCES

Checklist Item	Potentially Significant Impact	Less Than Significant After Mitigation	Less than Significant Impact	No Impact
Would the project...				
a. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?	☐	☐	☐	☒
c. Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☐	☒
d. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of the native wildlife nursery sites?	☐	☐	☒	☐
e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☒	☐
f. Conflict with the provisions of an adopted Habit Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☒	☐

4.4.1 Discussion

a. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?

A biological survey was performed for the Project Site and adjacent areas in the late 1990s. This survey identified the Project Site as potential habitat for the Delhi Sands flower-loving fly

(DSFLF), which is a federally protected species. Therefore, development of the area would have a potentially significant impact if not mitigated. As a result, the area to the northwest of the Project Site was established as a 30.5-acre habitat conservation area. This "Conservation Area" was set aside in the 1999 Habitat Conservation Plan established for the development of the area that includes the Project Site (Michael Brandman Associates, 1999). This Habitat Conservation Plan and associated Federal Fish and Wildlife Permit have been provided as Appendix A.

A new Biological Resources Study was performed in June 2020. The results of the study are presented in Appendix D. The purpose for performing the general biological survey was to identify potential biological resource constraints prior to development of the Proposed Project. The biological survey was conducted to document existing conditions and map biological resources present within the proposed Project Site and the associated 500-ft Buffer area (collectively, the 102.6-acre Survey Area). During the survey, biologists mapped vegetation communities, mapped and/or recorded plant and animal observations, documented bird nests, evaluated the potential for the presence of special-status plant and animal species and their habitats, and documented any sensitive plant communities. An evaluation of potentially jurisdictional aquatic features that occur within the Survey Area was also conducted to determine if a jurisdictional delineation would be recommended in the future. This included the potential presence of jurisdictional waters of the United States and State of California, including wetlands and waterways.

During the survey, three bird nests were observed within Southern California Edison lattice towers. One was an active red-tailed hawk (Buteo jamaicensis) nest and the other two were inactive corvid (common raven [Corvus corax] or American crow [Corvus brachyrhynchos]) nests, also located on lattice towers. Appropriate habitat for the Los Angeles Pocket Mouse (Perognathus longimembris brevinasus) was identified within the Survey Area, and the San Bernardino County Burrowing Owl (Athene cunicularia) overlay includes this area of the County. Additional consultation with state and county wildlife agencies may be performed to discuss these findings. However, no special-status plant or wildlife species were detected during the general biological assessment of the site.

Approximately 29.5 acres of DSFLF (Rhaphiomidas terminatus abdominalis) potential habitat occurs within the Survey Area. Since DSFLF are known to occur within the area, the potential habitat on-site is assumed to be occupied. The 30.5 acre habitat conservation area was established to mitigate potential impacts from development of the Project Site and previously developed adjacent areas. Therefore, impacts are less than significant after mitigation.

Mitigation Measure BIO-1: Maintain the DSFLF Conservation Area and adhere to the established Incidental Take Permit and Implementation Agreement.

b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or United States Fish and Wildlife Service (USFWS)?

The Proposed Project is not located on or adjacent to a riparian habitat or other identified sensitive natural community. Construction and operation of the Proposed project will not result in adverse effects on any riparian habitat. Therefore, there will be no impacts, and no mitigation is required.

c. Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

   The Proposed Project is not located on or adjacent to federally protected wetlands or other identified sensitive natural community. Construction and operation of the Proposed project will not result adverse effects on any riparian habitat. Therefore, there will be no impacts, and no mitigation is required.

d. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of the native wildlife nursery sites?

   During the June 2020 Biological Resources Study, three nests were identified in the Southern California Edison (SCE) lattice towers located adjacent to the Project Site. One was an active red-tailed hawk nest and the other two were inactive corvid or American nests. The Proposed Project will not alter the SCE lattice towers, and Operation of the Proposed Project will not substantially interfere with the movement of any migratory species or migratory corridors. Therefore, impacts will be less than significant, and no mitigation is required.

e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

   According to the County of San Bernardino's Biotic Resources Overlay Map the project site is located within the Burrowing Owl (Athene cunicularia) Overlay Zone. The burrowing owl is listed as a species of special concern (SSC) by California Department of Fish and Wildlife (CDFW). However, no owls or potential burrows were observed during the survey, and Angelus will request a waiver from additional surveys. Therefore, impacts are less than significant, and no mitigation is required.

f. Conflict with the provisions of an adopted Habit Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

   The area to the northwest of the Project Site is the 30.5-acre DSFLF habitat conservation area. This "Conservation Area" was set aside in the 1999 Final Habitat Conservation Plan established for the development of the area that includes the Project Site (Michael Brandman Associates, 1999). In compliance with the Habitat Conservation Plan and the executed Implementation Agreement, the USFWS authorized an Incidental Take Permit for the DSFLF on August 27, 1999 to Angelus Block Company, Inc., E-Z Mix, Inc., and the Edward Antonini Residuary Trust (Angelus Block et. al.). The Implementation Agreement and associated Federal Fish and Wildlife Permit are included in Appendix D.

4.4.2 Cumulative Impacts

The Conservation Area set aside in 1999 was established to allow development of multiple parcels including the Project Site. The other parcels have been developed and future disturbance of DSFLF habitat within the 1990 study area is not expected as long as the Conservation Area remains protected. Additional projects in the vicinity of the Project Site that may pose a threat to biological resources were not identified. Therefore, Therefore, cumulative impacts of the Proposed Project plus foreseeable past, present, and future development are less than significant. No additional mitigation required.

4.5 CULTURAL RESOURCES

Checklist Item	Potentially Significant Impact	Less Than Significant After Mitigation	Less than Significant Impact	No Impact
Would the project…				
a. Cause a substantial adverse change in the significance of a historical resource as defined in 15064.5?	☐	☐	☒	☐
b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to 15064.5?	☐	☐	☒	☐
c. Disturb any human remains, including those interred outside of dedicated cemeteries?	☐	☐	☒	☐

4.5.1 Discussion

a. Cause a substantial adverse change in the significance of a historical resource as defined in 15064.5? **Less than Significant Impact.**

CEQA Guidelines Section 15064.5 outlines a method to determine the significant of impacts to archaeological and historical resources. The section defines the term "historical resource" any resource that is listed or determined eligible for listing in the California Register of Historical Resources (CRHR), included in a local register of historical resources, or is determined by a lead agency to be a historical resource. Eligibility criteria for the CRHR are the same as those for the National Register of Historic Places as defined by 36 Code of Federal Regulations (CFR) 60.4. A cultural resources survey was performed to determine if historical resources are present and to assess their significance. The full Cultural Resources Assessment can be found in Appendix E.

As the entire Project Site will be regraded, the area of potential effect (APE) for the purposes of the cultural resources survey covers the entire Project Site. A systematic pedestrian survey of the APE with transects no more than 15 meters apart was conducted. No cultural resources were encountered during the survey. No previous cultural resources surveys have been performed within the APE.

The Proposed Project is adjacent to the Agua Mansa Pioneer Cemetery, a known historical period cemetery. The AMSP describes the Agua Mansa Pioneer Cemetery as "a notable historical resource which warrants preservation." However, there is no excavation planned near the cemetery. An existing berm located on the Project Site outside of the protective fencing surrounding the cemetery may be disturbed during construction activities but will be replaced or enhanced as part of the Proposed Project. The retaining wall between the berm and the existing paver storage area in the southern portion of the Project Site will be rebuilt into a more substantial structure with a forklift ramp leading to the new facility.

Due to the proximity of the cemetery, an Inadvertent Discovery Plan has been developed for the Proposed Project and outlines procedures to be followed in the unlikely event any archaeological materials, sites, or human remains are discovered. The Inadvertent Discovery

Plan is included in Appendix E. No further archaeological work is required.

Section 15064.5(b)(1) describes substantial adverse change in the significance of a historical resource as “physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired.” Construction and operation of the Proposed Project does not involve the physical demolition, destruction, relocation, or alteration of any historical resource, including the Agua Mansa Pioneer Cemetery, and its immediate surroundings. Therefore, the Proposed Project will have a less than significant impact regarding adverse changes in the significance of a historical resource. No mitigation is required.

b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to 15064.5? **Less than Significant Impact.**

The Cultural Resources Assessment (Appendix E) provides an archaeological overview of the San Bernardino Valley in which the Proposed Project is located. Archaeological evidence indicates evidence of human occupation in the region dating back 8,500 years ago. Archaeological sites from the San Dieguito Complex provide evidence of Early Holocene occupation and are primarily found along the ancient lake terraces in coastal San Diego County or on the island off of the Pacific Coast. During the Middle Holocene the Greven Knoll pattern found in the region encompassing inland San Bernardino, Riverside, Orange, and Los Angeles Counties demonstrates a shift away from hunting-related assemblages towards plant processing assemblages. This continued through the Late Holocene, between AD 500 and European Contact. During the site walkthrough, no archaeological resources were identified. Therefore, the Proposed Project will not cause a substantial adverse change in an archaeological resource, and impacts are less than significant. No mitigation required.

c. Disturb any human remains, including those interred outside of dedicated cemeteries? **Less than Significant Impact.**

The Cultural Resources Assessment (Appendix E) provides an ethnographic background of the area in which the Proposed Project is located. The Project Site is located on the eastern edge of traditional Gabrielino territory.

As described in part a., the Proposed Project is located adjacent to the Agua Mansa Pioneer Cemetery. The cemetery is considered a notable historic resource in the AMSP. Due to the proximity of the cemetery, an Inadvertent Discovery Plan will be developed for the Proposed Project prior to construction to outline procedures to be followed in the unlikely event any archaeological materials, sites, or human remains are discovered. Section 15065.5(e) states procedures to follow in the event of the accidental discovery or recognition of any human remains in any location other than a dedicated cemetery. Any excavation or disturbance of the site or any nearby area will be immediately ceased following such discovery. Appropriate steps shall be followed, including contacting the coroner of the county to determine that no investigation of the cause of death is required and to determine whether the remains are those of a deceased Native American. These protocols will result in less-than-significant impacts, and no mitigation is required.

4.5.2 Cumulative Impacts

The Proposed Project would have less-than-significant impacts to historical, known archaeological or paleontological resources, or known human remains. The chances of cumulative impacts occurring as a result of the Proposed Project plus reasonably foreseeable past, present, and future development in the region is not likely since other projects would be subject to individual project-level environmental review. Due to existing laws and regulations in place to protect cultural resources and prevent significant impact to paleontological resources and less-than-significant project-level impacts, the potential incremental effects of the Proposed Project would not be cumulatively considerable.

4.6 ENERGY

Checklist Item	Potentially Significant Impact	Less Than Significant After Mitigation	Less than Significant Impact	No Impact
Would the project…				
a. Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	☐	☐	☒	☐
b. Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	☒	☐

4.6.1 Discussion

a. Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation? **Less than Significant Impact.**

Construction of the Proposed Project will consume energy resources at an amount consistent with projects of a similar size. Construction of the Proposed Project will not be wasteful and inefficient with regards to energy consumption and will not consume unnecessary energy. The Proposed Project includes one Manufacturing Plant Building, which houses four separate concrete block manufacturing lines. Consolidating block manufacturing processes under one roof reduces overall resource use in the following ways:

- Consolidated material delivery and storage
- Reduces construction of four separate buildings into one
- Centralized heat generation for all four curing chambers

The Proposed Project will implement passive design elements suggested in the Agua Mansa Specific Plan to reduce heating and cooling loads which will maximize energy-efficiency during operation of the Proposed Project. Examples of site-specific planning measures to maximize energy-efficiency include provision of shade trees in parking areas, minimization of paved areas, and locating buildings to facilitate natural ventilation and cooling. Unfortunately, due to the nature of the Proposed Project, the entire site must be graded and repaved using pervious interlocking pavers to facilitate transport of product throughout the facility. Shade trees will be planted within the parking area in the southern portion of the Project Site next to the Admin Building.

Once operational, the Proposed Project will not consume unnecessary energy resources. The Proposed Project will prioritize efficiency and minimize wasteful and inefficient energy consumption. The Agua Mansa Specific Plan proposes additional measures that can be incorporated into the design of individual buildings to reduce the consumption of energy. From the list, the Proposed Project will implement the following: the use of fluorescent lighting rather than less efficient lighting; installation of attic fans or other ventilation devices;

installation of thermal insulation in walls and ceilings which meets or exceeds standards established by the State of California; use of tinted or solar reflective glass on appropriate exposures; use of heat-reflecting glass and drapery on all office window glass to reduce cooling loads; use of windowless walls for southern and western exposures; lighting switches and multi-switch provisions for control by occupants and building personnel to permit optimum energy use; and public area lighting, both interior and exterior, should be time-controlled and limited to that necessary for the safety of persons and property. The Proposed Project is estimated to consume 6,000 kilowatt-hours (kWh) of electricity per day. The primary uses of electricity will be lighting at the site for operational and security purposes. Measures, including those listed above, will be implemented to minimize use of electricity. Energy-efficient exterior lighting fixtures will be used whenever possible.

The Project Site is zoned for industrial uses and the Proposed Project will serve that intended purpose. By nature, industrial facilities, including the Proposed Project, consume energy during construction and operation. However, the Proposed Project will implement energy efficient measures that prioritize energy efficiency during both construction and operation to mitigate wasteful and unnecessary energy consumption. Therefore, the Proposed Project will result in a less than significant impact on unnecessary consumption of energy resources. No mitigation is required.

b. Conflict with or obstruct a state or local plan for renewable energy or energy efficiency? Less than Significant Impact.

The Project Site has been owned and maintained by Angelus since the late 1990's. There have been no historical or existing plans related to renewable energy or energy for the Project Site. The Proposed Rialto Bioenergy Facility, which aims to generate electricity from a combination of food waste, liquid waste, and municipal biosolids, is located approximately 0.6 miles north of the Project Site. The Proposed Project will not conflict with or obstruct the Rialto Bioenergy Facility or any other energy related sites in the vicinity.

The Proposed Project will receive electricity from Southern California Edison, which is involved in meeting California's energy efficiency and renewable goals. In addition, the facility is expected to have less than significant impacts regarding GHG emissions (See Section 4.8). Therefore, the Proposed Project will have a less than significant impact on state or local plans for renewable energy or energy efficiency. No mitigation is required.

4.6.2 Cumulative Impacts

The Project Site is situated on land zoned for industrial use. As such, any project located at the Project Site will utilize energy resources for construction and operation. The Proposed Project will serve the land's intended use and consume energy resources in line with projects of a similar size during construction and operation. The Proposed Project will implement design elements and measures listed in the Agua Mansa Specific Plan to reduce unnecessary consumption of energy resources. The Proposed Project will not be wasteful or inefficient with regards to energy consumption and will have a less than significant environmental impact during project construction and operation.

There are no state or local plans for renewable energy or energy efficiency on or within the vicinity of the Project Site. Therefore, the Proposed Project will not conflict with or obstruct a state or local plan for renewable energy. The industrial nature of the Proposed Project will result in a less than significant impact on energy efficiency. The Proposed Project in addition to past, present, and reasonably foreseeable future development would affect the consumption of energy, during construction and operation. However, all development would adhere to applicable policies and plans regarding energy, particularly renewable energy and energy efficiency. Therefore, energy impacts are not expected to be cumulatively considerable and impacts would be less than significant. No mitigation is required.

4.7 GEOLOGY / SOILS

Checklist Item	Potentially Significant Impact	Less Than Significant After Mitigation	Less than Significant Impact	No Impact
Would the project…				
a. Expose people or structure to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on the other substantial evidence of a known fault? (Refer to Division of Mines and Geology Special Publication 42)	☐	☐	☒	☐
ii. Strong Seismic ground shaking?	☐	☐	☒	☐
iii. Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐
iv. Landslides?	☐	☐	☐	☒
b. Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐
c. Be located on a geologic unit or soil that is unstable, or that would be become unstable as a result of the project, and potentially result in on or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☒	☐
d. Be located on expansive soil, as defined in Table 18-1B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☒	☐
e. Having soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	☒

4.7.1 Discussion

a. Expose people or structure to potential substantial adverse effects, including the risk of loss, injury, or death involving:

i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on the other substantial evidence of a known fault? (Refer to Division of Mines and Geology Special Publication 42) **Less than Significant Impact.**

The Alquist-Priolo Earthquake Fault Zoning Act (Alquist-Priolo Act) was passed in 1972 as a response to the devastating 1971 San Fernando earthquake that caused severe structural damages and resulted in over 60 deaths. The Alquist-Priolo Act aims to "reduce losses from surface fault rupture" by prohibiting "the location of developments and structures for human occupancy across the trace of active faults" (California Department of Conservation, 2019b) (California Legislative Information). An active fault is defined as a fault that has ruptured within the last 11,000 years. In active fault zones, "a structure for human occupancy cannot be placed over the fault and must be a minimum distance from the fault (generally fifty feet)" (California Department of Conservation, 2019b).

The California Department of Conservation developed the California Earthquake Hazards Zone Application (EQ Zapp), an online map that allows users to determine if a land parcel or property is located within an earthquake hazard zone (California Department of Conservation, 2019c). The information is provided by the California Geological Survey (CGS), the authority on California's geologic information and resources. According to EQ Zapp, the Project Site is not within an Earthquake Fault Zone. The closest fault line to the Project Site is the San Jacinto Fault, which runs north to south from San Bernardino County at the Cajon Pass (northern endpoint) to San Jacinto Valley (southern endpoint). The Project Site is located approximately 3 miles southwest of the closest point on the San Jacinto Fault, where South Mt. Vernon Ave intersects the San Bernardino Freeway (Interstate 10).

ii. According to General Plan, "the San Jacinto, San Andreas, and Cucamonga faults have the potential of generating earthquakes of maximum magnitudes ranging from 6.7 to 8.0." To minimize the hazards related to seismic activity, the General Plan implemented the following goals and policies: Less than Significant Impact.

Goal 5-1: Minimize hazards to public health, safety, and welfare associated with geotechnical hazards.

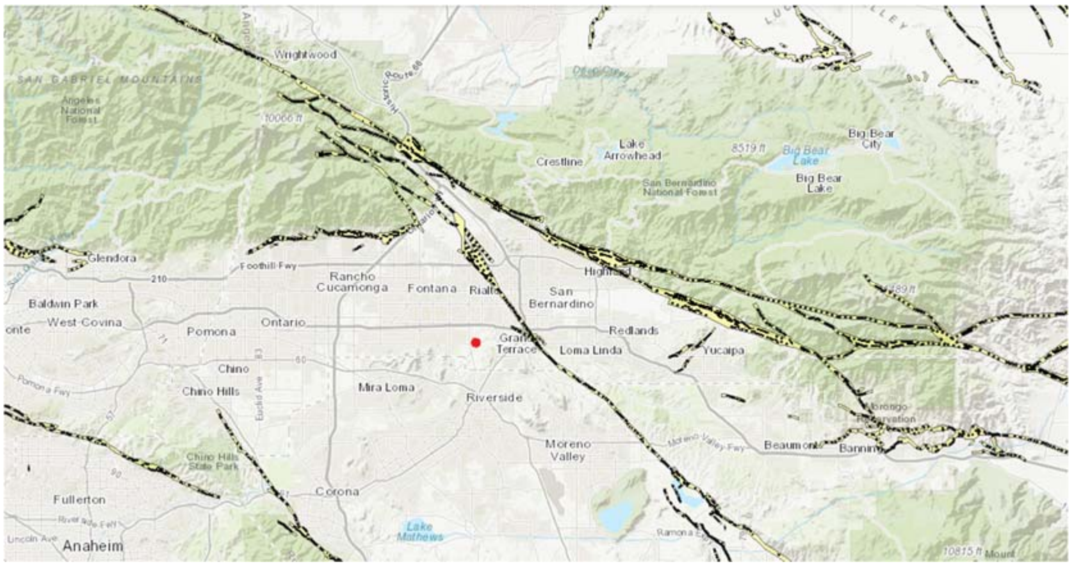
Policy 5-1.1: Require geotechnical investigations by certified engineering geologist or other qualified professionals for all grading and construction projects subject to geologic hazards, including fault rupture, severe ground shaking, liquefaction, landslides, and collapsible or expansive soils. Particular attention should be paid to areas within Alquist-Priolo Earthquake Fault Zones.

Policy 5-1.2: Requires all construction to be in conformance with the Uniform Building Code (UBC) and the California Building Code (CBC), and to be consistent with the Municipal Code as it provides for earthquake resistant design excavation, and grading.

A Preliminary Geotechnical Investigation of the Project Site (Geotechnical Investigation) to evaluate geological hazards has been performed by KLING Consulting Group and is provided as Appendix F. Recommendations made within the Geotechnical Investigation regarding construction of the Proposed Project have been taken into account in the design of the Proposed Project. Furthermore, the Proposed Project will be constructed in conformance with all the applicable standards to minimize the potential damage caused by seismic hazards. Therefore, the probability of exposing people or structures to potential substantial adverse effects involving the rupture of a known fault is less than significant. No mitigation is required.

iii. Strong Seismic ground shaking? Less than Significant Impact.

The Project Site is located in Southern California, a region known to have frequent occurrences of seismic activity as a result of the numerous fault lines in the area. The map below, from California Department of Conservation’s EQ Zapp, illustrates the fault lines in the vicinity of the Project Site, signified by the red circle.



The closest fault line to the Project Site is the San Jacinto Fault, located approximately 3 miles northeast from the approximate center of the Project Site. Additional faults within vicinity of the Project Site include the San Andreas Fault located approximately 10 miles to the north as well as the Chino Fault, the Elsinore Fault, and the Cucamonga Fault. Seismic tremors from these and other faults in the area may lead to ground shaking at the Project Site. The Construction of the Proposed Project will comply with CBC including the 2019 updates, City of Rialto regulations as well as any other applicable requirements. The tallest structure at the Proposed Site will be the Manufacturing Plant Building at 57 feet. Complying with construction standards for areas with high risk for seismic shaking would reduce the probability of exposing people or structures to potential substantial adverse effects involving the strong seismic ground shaking to a less than significant level. No mitigation is required.

iv. Seismic-related ground failure, including liquefaction? Less than Significant Impact.

Liquefaction is defined in the General Plan as “the transformation of loose sediment or soil into a fluid state as result of increasing the pressure of the fluid in between the grains due to strong ground shaking." The General Plan further states that "liquefaction typically occurs in poorly consolidated water-saturated sediment. Liquefaction can cause significant earthquake-related damage because structures located on ground the liquefied can collapse or sink into the ground."

According to the California Earthquake Hazards Zone Application (EQ Zapp), the entire Project Site has not been evaluated by CGS for liquefaction hazards. The General Plan does not indicate any liquefaction hazards at the Project Site. The Geotechnical Investigation found that the ground primarily consists of Old Eolian Dune Deposits comprised of "clayey sands, silty sands, and silty sands with gravel which were generally medium dense to very dense and damp to moist." The Geotechnical Investigation indicates that after "review of published geologic data, subsurface data, laboratory testing, the lack of a shallow static groundwater table, and the overall dense nature of the underlying onsite soils… the site is not susceptible to liquefaction." The Geotechnical Investigation further states that the "materials underlying the site are overall relatively dense and the dry settlement potential is considered low." Additionally, "the potential for lateral spreading is unlikely based on information which indicates that the site is not likely to be liquefiable." Therefore, potential substantial adverse effects involving seismic-related ground failure, including liquefaction, is less than significant. No mitigation is required.

v. Landslides? No Impact.

The U.S. Geological Survey (USGS) defines landslides as the mass movement of rock debris, or earth down a slope. The Project Site has not been evaluated by CGS for seismic landslide hazards. However, the Project Site is relatively flat and is not located in an area that is at risk to landslides according to Geologic Hazard Maps from San Bernardino County's Land Use Services Department (San Bernardino County, 2016). Therefore, landslides have no impact on exposing people or structures to potential substantial adverse effects at the Project Site. No mitigation is required.

b. Result in substantial soil erosion or the loss of topsoil? Less than Significant Impact.

Construction of the Proposed Project includes grading of the entire site, during which soil may be displaced and the potential for soil to erode may increase temporarily. The risk of soil erosion and loss of topsoil will be mitigated using standard erosion control practices. In addition, the Proposed Project will occupy approximately 32 acres of land. Therefore, construction of the Proposed Project triggers the requirement for a Stormwater Pollution Prevention Plan (SWPPP) under the National Pollutant Discharge Elimination System (NDPES) General Construction Permit. Conformance to Best Management Practices (BMPs) to be outlined in the SWPPP will reduce soil erosion and the loss of topsoil due to stormwater runoff to a less than significant level. No mitigation is required.

c. Be located on a geologic unit or soil that is unstable, or that would be become unstable as a result of the project, and potentially result in on or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse? Less than Significant Impact.

As stated in parts a. iii. and iv. the Project Site is not susceptible to liquefaction and landslides. The Geotechnical Investigation states that “the potential for liquefaction and lateral spreading to occur within the site is unlikely due to the lack of a shallow static groundwater table and the overall dense nature of underlying on-site soils.” The Proposed Project is not located on a geologic unit or soil that is unstable, or that would become unstable as a result of the of the Proposed Project. The Proposed Project is unlikely to result in on or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse. Therefore, the Proposed Project will have a less than significant impact. No mitigation is required.

d. Be located on expansive soil, as defined in Table 18-1B of the Uniform Building Code (1994), creating substantial risks to life or property? Less than Significant Impact.

   The Proposed Project will receive a building permit from the City of Rialto prior to construction commencement. Compliance with the Uniform Building Code is a requisite for obtaining a building permit which encompasses a soil study to determine feasibility of construction. Furthermore, the Geotechnical Investigation found that the Project Site is located on “overall dense” soil and the tests indicated that “the upper near surface soils possess a very low to low expansion potential.” Therefore, the Proposed Project will have a less than significant impact and no mitigation is required.

e. Having soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater? No Impact.

   Sewers are available at the Project Site. Therefore, Proposed Project will not utilize septic tanks or alternative wastewater disposal systems. The Proposed Project will have no impact and therefore no mitigation is required.

4.7.2 Cumulative Impacts

Potential impacts related to geology and soils are generally site specific. The geological analysis concluded that the Proposed Project will not result in any significant impacts related to seismic activity, soil erosion, or soil integrity. The design of the Proposed Project complies with local and state regulations to protect people and structures to potential substantial adverse effects related to pertinent geological risks. The existing regulations ensure past, present, and reasonably foreseeable future development do not have significant soil and geological impact in the City of Rialto. The Geotechnical Investigation performed on the subsurface soils at the Project Site concluded that the Proposed Project is “geotechnically feasible, provided that the recommendations from the report are followed.” As previously stated, all recommendations provided within the report have been implemented in site development and design of the Proposed Project.

The Proposed Project in addition to past, present, and reasonably foreseeable future development would have limited impacts on the geology and soil composition of the area. Therefore, the hazards associated with the geology and soil of the Project Site are not expected to be cumulatively considerable and impacts would be less than significant. No mitigation is required.

4.8 GREENHOUSE GAS EMISIONS

Checklist Item	Potentially Significant Impact	Less Than Significant After Mitigation	Less than Significant Impact	No Impact
Would the project...				
a. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐
b. Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐

4.8.1 Discussion

a. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

The Proposed Project would generate GHG emissions from sources including natural gas consumption, employee and truck travel, use of off-road and portable equipment, and consumption of electricity. GHG emission generated by the Proposed Project during construction and operation were quantified and presented in Appendix B. GHG emissions from the Proposed Project and comparison to SCAQMD Significance Thresholds are summarized in the following table.

Table GHG-1: GHG Emissions Summary

	Construction	Operation
Annual Emissions (MT/yr)	814	4,482
SCAQMD Significance Threshold (MT/yr)	10,000	10,000
Exceedance?	No	No

GHG emissions from the Proposed Project are below the SCAQMD Significance Thresholds. Therefore, the impacts will be less than significant. No mitigation required.

b. Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

California has many plans, policies, and regulations adopted for the purpose of reducing GHG emissions. Most notably, Assembly Bill (AB) 32, which set the goal of reducing California's GHG emissions to 1990 levels by 2020. An executive order set further GHG targets of reducing California's GHG emissions to 80 percent below 1990 levels by 2050. In order to meet these targets, California has established policies, including but not limited to the energy efficiency standards of Title 24, also known as CalGreen. In addition, SCAQMD Significance Thresholds were established to adhere to California's GHG reduction targets.

As discussed in Section 4.6, Energy, the Proposed Project will implement multiple energy efficiency measures in order to reduce energy consumption. These measures will be in compliance with CalGreen standards. Since the project meets energy efficiency standards and does not exceed quantifiable significance thresholds for GHG emissions, the Proposed Project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs, and impacts would be less than significant. No mitigation required.

4.8.2 Cumulative Impacts

GHG emissions are a global pollutant. Therefore, determining significance on a project-level is difficult. SCAQMD's significance threshold for GHG emissions from industrial facilities provides a quantifiable determination for whether a project's GHG emissions can be considered cumulatively considerable. The Proposed Project would generate GHG emissions below SCAQMD's Significance Thresholds and would comply with California's climate-related goals. Therefore, the Proposed Project would not less-than-significance cumulative impacts with reasonably foreseeable past, present, and future development. No mitigation required.

4.9 HAZARDS AND HAZARDOUS MATERIALS

Checklist Item	Potentially Significant Impact	Less Than Significant After Mitigation	Less than Significant Impact	No Impact
Would the project…				
a. Create a significant hazard to the public or the environment through the routine transport, use or disposal of hazardous materials?	☐	☐	☒	☐
b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐
c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
d. Be located on a site which is included on a list of hazardous material sites complied pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒
e. Be located on a site which is included on a list of hazardous material sites complied pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒
f. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
g. Expose people or structures to a significant risk of loss, injury or death involving wild land fires, including where wild lands are adjacent to urbanized areas or where residences are intermixed with wild lands?	☐	☐	☐	☒

4.9.1 Discussion

a. Create a significant hazard to the public or the environment through the routine transport, use or disposal of hazardous materials? **Less than Significant Impact.**

A hazardous material is defined as any item or agent (biological, chemical, radiological, and/or physical) which has the potential to cause harm to humans, animals, or the environment, either by itself or through interaction with other factors (University of Pittsburgh, 2020). In California, hazardous materials are regulated by the USEPA, DOT, the

Department of Toxic Substances and Controls (DTSC), and local CUPAs.

During the project construction phase, the primary hazardous material to be used and stored on the Project Site is diesel fuel used by the forklifts. Besides the 4,000-gallon diesel AST, operation of the Proposed Project will not involve the storage of large quantities of hazardous materials or generation of hazardous wastes. Maintenance of on-site vehicles and equipment will be performed on site within the Industrial / Shop Building. Hazardous materials that will be stored and used in the Shop motor oil, hydraulic fluid, and coolant. Petroleum, oils, and lubricants (POLs) will be stored in 55-gallon drums within a secondary containment palette. There will also be drums containing California hazardous wastes including used oil, used coolant, and used absorbent. The facility will obtain an EPA ID number for generation of hazardous waste and prepare and submit a Hazardous Materials Business Plan (HMBP) through the California Environmental Reporting System (CERS).

Total storage of POLs stored in aboveground containers will exceed 1,320 gallons, therefore the facility will prepare a Spill Prevention, Control, and Countermeasure (SPCC) plan. The SPCC plan will be signed by a Registered Engineer. Equipment will be maintained regularly to reduce the possibility of leaks and releases.

The Proposed Project will not routinely transport, use, or dispose of large quantities of hazardous materials or hazardous wastes. Finished products are inert construction materials that do not pose a significant hazard during transport. All handling of hazardous materials and hazardous wastes will comply with local, state, and federal health and safety regulations to mitigate the risks to the public and environment. Therefore, the Proposed Project would have a less than significant impact on hazards associated with routine transport, use, or disposal of hazardous materials. No mitigation is required.

b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment? **Less than Significant Impact.**

The Project Site will include one ~4,000-gallon diesel AST with one fuel dispenser. Facilities that store an aggregate aboveground oil storage capacity greater than 1,320 gallons and have reasonable expectation of an oil discharge into navigable waters of the U.S. or adjoining shorelines trigger the Spill Prevention, Control, and Countermeasure (SPCC) rule (USEPA, 2010). The SPCC rule requires the preparation and implementation of an SPCC Plan that describes oil handling operations, spill prevention practices, discharge or drainage controls, and the personnel, equipment and resources at the facility that are used to prevent oil spill from reaching navigable waters or adjoining shorelines. In compliance with the SPCC rule, the diesel tank will have secondary containment and be inspected monthly to prevent any potential releases or spills.

Other hazardous materials and wastes at the facility will be stored in 55-gallons drum containers or smaller. The drums will be kept in secondary containment pallets capable of holding 110% of the volume of the largest container. Spill kits will be kept and maintained in the vicinity of all hazardous material storage. Implementation and adherence to safe handling procedures and precautions will ensure that the likelihood of a hazardous material release from the Project Site is low. Therefore, Proposed Project would create a less than significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. No mitigation is required.

c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school? No Impact.

The nearest school, Crestmore Elementary at 18870 Jurupa Ave, Bloomington, CA, is located approximately 1.6 miles to the west of the Project Site. There are no proposed schools within the vicinity of the Proposed Project. Therefore, the Proposed Project will have no impact. No mitigation is required.

d. Be located on a site which is included on a list of hazardous material sites complied pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment? No Impact.

Government Code Section 65962.5 requires the compilation of the Hazardous Waste and Substances Sites (Cortese) List, a planning document that provides information regarding the location of hazardous materials release sites (DTSC, 2020). The Project Site is not located on the Cortese List; therefore, the Proposed Project would have no impact on creating a significant hazard to the public or the environment from an existing hazardous materials site. No mitigation is required.

e. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in the safety hazard for people residing or working in the project area? No Impact.

The Proposed Project is not located within an airport land use plan nor is it located within two miles of a public airport or public use airport. The nearest airport, San Bernardino International Airport, is located approximately 7 miles to the northwest of the Project Site. Therefore, the Proposed Project would not result in a safety hazard for people residing or working in the project area. No impact would occur, and no mitigation is required.

f. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan? No Impact.

The Proposed Project will not impair implement of or physically interfere with an adopted emergency response plan or emergency evacuation plan. Construction and operation of the Proposed Project would not interfere with access on major roads in the vicinity, including Agua Mansa Road and Riverside Avenue. No impact would occur, and no mitigation is required.

g. Expose people or structures to a significant risk of loss, injury or death involving wild land fires, including where wild lands are adjacent to urbanized areas or where residences are intermixed with wild lands? No Impact.

The Project Site is not identified as a fire hazard area in the General Plan. The Proposed

Project would not expose people or structures to a significant risk of loss, injury or death involving wildland fires. No impact would occur, and no mitigation is required.

4.9.2 Cumulative Impacts

Potential impacts related to hazards and hazardous materials are generally site specific. All hazardous materials stored and used at the facility will be handled in compliance to applicable regulations. With safe handling procedures in place, project-related impacts to the transport, use, and disposal of hazardous materials are less than significant. The Proposed Project would not result in impacts that in addition to past, present, and reasonably foreseeable future development would cause significant adverse effects with regards to hazards and hazardous materials. would affect the appearance of the site and surrounding area. Therefore, hazards and hazardous materials impacts are not expected to be cumulatively considerable and impacts would be less than significant. No mitigation is required.

4.10 HYDROLOGY / WATER QUALITY

Checklist Item	Potentially Significant Impact	Less Than Significant After Mitigation	Less than Significant Impact	No Impact
Would the project...				
a. Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	☐	☐	☒	☐
b. Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☐	☐	☒	☐
c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	☐	☐	☐	☒
d. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:	☐	☐	☒	☐
i. Result in a substantial erosion or siltation on- or off site;	☐	☐	☒	☐
ii. Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;	☐	☐	☒	☐
iii. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or	☐	☐	☒	☐
iv. Impede or redirect flood flows?	☐	☐	☐	☒
e. In flood hazard, tsunamic, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	☐	☒
f. Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☒	☐

4.10.1 Discussion

a. Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality? Less than Significant Impact.

The Proposed Project will operate under Standard Industrial Classification (SIC) Code 3271 – Concrete Block and Brick. Facilities operating with industrial SIC Codes, including 3271, require coverage under State Water Resources Control Board (SWRCB) Order 2014-0057-DWQ as amended by Order 2015-0122-DWQ and Board Adopted amendments on November 6, 2018 (effective July 1, 2020), referred to as the California Industrial General Stormwater Permit (IGP). The IGP contains requirements for the permitting, monitoring, and reporting for "new facilities," which are summarized below:

A "New Discharger" applying for coverage under the IGP has two options for Permit coverage and one option for exclusion. The first option is a No Exposure Certification (NEC) if a facility can demonstrate they have no exposure of industrial activities and materials to storm water discharges. The second option is a Notice of Intent (NOI) for Permit coverage for dischargers that discharge storm water associated with industrial activity to waters of the United States and are required to meet all applicable requirements of the Industrial General Permit. The exclusion option is a Notice of Non-Applicability (NONA) which can be submitted for facilities that are not connected or that do not discharge to waters of the United States. In the case of Angelus Block, the facility will be constructed as a facility with potential exposure of pollutants and the potential to discharge to waters of the U.S. and will require a NOI for Permit coverage.

A "New Discharger" that will be discharging to an impaired water body with a Clean water Act (CWA) Section 303(d) List impairment requires the assistance of a Qualified Industrial Stormwater Practitioner (QISP) to demonstrate the following:

- The Discharger has eliminated all exposure to storm water of the pollutant(s) for which the water body is impaired, has documented the procedures taken to prevent exposure onsite, and has retained such documentation with the SWPPP at the facility;

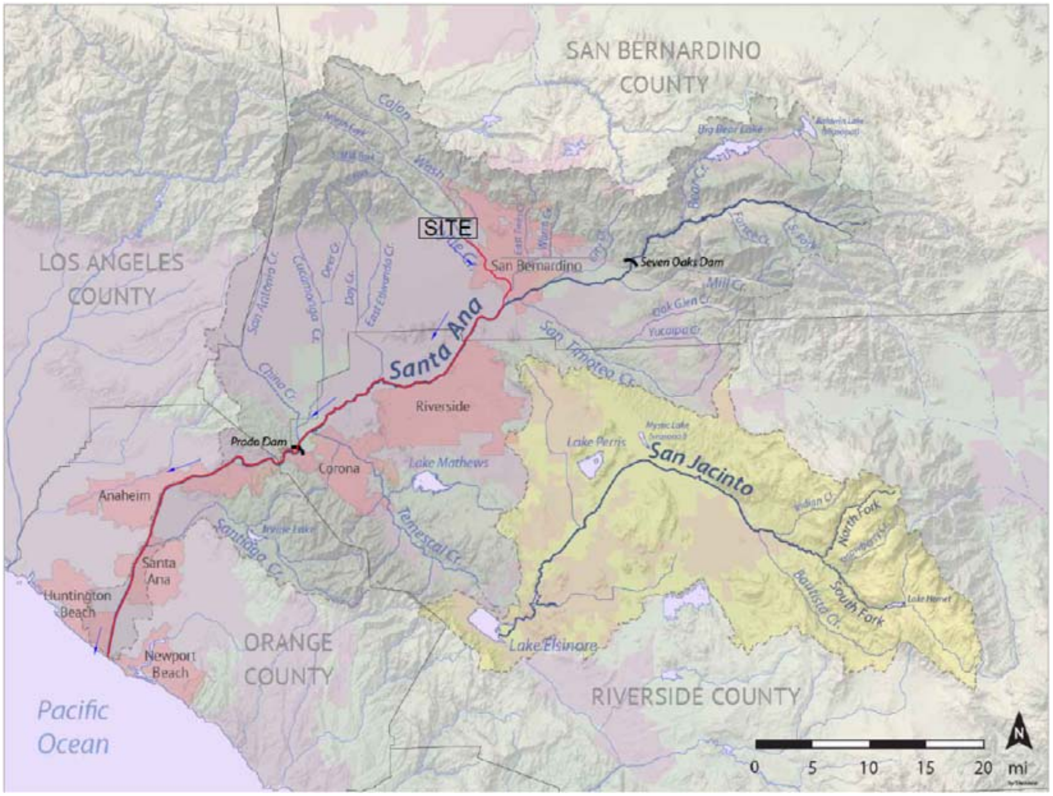
- The pollutant for which the water body is impaired is not present at the Discharger's facility, and the Discharger has retained documentation of this finding with the SWPPP at the facility; or,

- The discharge of any listed pollutant will not cause or contribute to an exceedance of a water quality standard. This is demonstrated if: (1) the discharge complies with water quality standard at the point of discharge, or (2) if there are sufficient remaining waste load allocations in an approved Total Maximum Daily Load (TMDL) and the discharge is controlled at least as stringently as similar discharges subject to that TMDL.

The IGP requires a QISP to assist the "New Discharger" with this determination because individuals making this determination will need expertise in industrial storm water pollutant sources, BMPs, and a thorough understanding of complying with U.S. EPA's storm water regulations, and requirements of this General Permit. The General Permit requires a Discharger to monitor additional parameters if the discharge(s) from its facility contributes pollutants to receiving waters that are listed as impaired for those pollutants (i.e., §303(d) listings). For example, if a Discharger discharges to a water body that is listed as impaired for copper, and the discharge(s) from its facility has potential sources of copper, the Discharger must add copper to the list of parameters to monitor in its storm water discharge.

Additionally, the IGP mandates that all new development and redevelopment exceeding certain size criteria design treatment BMPs based on a specific storm volume to meet the 85th percentile 24-hour storm event design criteria.

The Proposed Project is planned for development in the City of Rialto, in San Bernardino County, California. Potential stormwater discharges from the facility follow the flow path through Lytle Creek, to Warm Creek, to the Santa Ana River, and ultimately discharge to the Pacific Ocean, which is shown in the following figure.



The water bodies downstream of Angelus Block have certain impairments and designated pollutants. Table HYD-1 depicts the CWA 303(d) impairments from the 2010 approved version of the IGP. While the permit requires the review of the 2010 List, Table HYD-2 depicts the 2014/2016 expected impairments which are still in the process of approval. New facilities should include potential listings that may impact their operations in the future.

Table HYD-1: 2010 Clean Water Act Section 303(d) Impaired Waters (Angelus Block Tributaries)

Relevant Water Body	Impairments/ TMDL	Listing Year	Pollutants	Potential Industrial Contribution from the Proposed Project?
Lytle Creek	303(d)	2010	Pathogens	No
Warm Creek	-	2010	-	-
Santa Ana River Reach 2	303(d)	2010	Indicator Bacteria	No
Santa Ana River Reach 3	303(d)	2010	Pathogens, copper, lead	Limited, non-point source potential for copper
Santa Ana River Reach 4	303(d)	2010	Pathogens	No

Table HYD-2: 2014/2016 Clean Water Act Section 303(d) Impaired Waters (Angelus Block Tributaries)

Relevant Water Body	Impairments/ TMDL	Listing Year	Pollutants	Potential Industrial Contribution from the Proposed Project?
Lytle Creek	-	2014/16	-	-
Warm Creek	303(d)	2014/16	Indicator Bacteria	No
Santa Ana River Reach 2	-	2014/16	-	-
Santa Ana River Reach 3	303(d)	2014/16	Copper, lead, indicator bacteria	Limited, non-point source potential for copper
Santa Ana River Reach 4	303(d)	2014/16	Fecal indicator bacteria	No

There are no industrial related TMDLs in the Santa Ana River downstream of the Project Site location. It is not anticipated that the Proposed Project has any industrial sources related to the downstream impairments. Copper and lead, while listed for Santa River Reach 3 in both Tables HYD-1 and HYD-2, are not likely to be used in industrial operations at the facility. However, to avoid potential permitting issues, the facility should address any potential non-point sources or uses of products containing trace concentrations of these constituents.

The Proposed Project should be able to meet the filing requirements to acquire NOI coverage under the Industrial General Permit. The facility will need to follow the filing requirements including registration in the Stormwater Multiple Application and Report Tracking System (SMARTS), development of site maps, BMPs, and SWPPP including a Monitoring Implementation Plan (MIP). At a minimum, the MIP will need to include the IGP basic required parameters pH, total suspended solids, oil and grease, and the SIC 327X required additional monitoring for iron.

Coverage under the IGP and implementation of the necessary BMPs will ensure compliance with waste discharge requirements. BMPs and monitoring will reduce potential discharge of stormwater pollution, and therefore, reduce potential impacts to surface water quality. Therefore, impacts from the Proposed Project are less-than-significant. No mitigation is required.

b. Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin? **Less than Significant Impact.**

   Water usage and demand is discussed in Section 4.19, Utilities. Water usage expected by the Proposed Project conforms with expected increase in demand projected by the water purveyor. The Project Site will be paved with interlocking pervious pavers, which allow for infiltration and groundwater recharge. The site has been designed to accommodate an 85th percentile, 24-hour storm flow, which conforms with applicable post-construction water quality management requirements. Therefore, impacts to groundwater supplies will be less than significant. No mitigation required.

c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site? **Less than Significant Impact.**

   The current condition of the Project Site is a mostly flat, graded, partially compacted area. The Proposed Project will include minor grading but will not significantly alter the elevation or topography of the Project Site. The Proposed Project would not affect any rivers or streams. The Project Site will be paved with impervious interlocking pavers to allow for infiltration. Any excess volume would be discharged from the site through existing drainage infrastructure. As the site and existing infrastructure are paved, the Proposed Project would not result in substantial erosion. No mitigation required.

d. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:

   a. Result in a substantial erosion or siltation on- or off site? **Less than Significant Impact.**

      As discussed above, the Proposed Project would not significantly alter the site or area.

   b. Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite? **Less than Significant Impact.**

      The Project Site will be paved with pervious interlocking pavers to allow for infiltration. The only impervious area added as part of the Proposed Project are the footprint/roof of each building. The Project Site has been designed to accommodate an 85th percentile, 24-hour storm flow. Therefore, the Proposed Project will not substantially increase the rate or amount of surface runoff, and impacts are less than significant. No mitigation required.

c. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff? **Less than Significant Impact.**

As discussed above, the Proposed Project would require coverage under the IGP. Implementation of BMPs in accordance with the IGP would minimize new sources of polluted runoff. In addition, the Project Site will be paved with pervious interlocking pavers to allow for infiltration. The only impervious area added as part of the Proposed Project are the footprint/roof of each building. The Project Site has been designed to accommodate an 85th percentile, 24-hour storm flow. Excess volumes would discharge to existing infrastructure, which is designed to handle the additional potential runoff. No mitigation required.

d. Impede or redirect flood flows? **No Impact.**

The Project Site is not located within a flood plain and flood flows will not travel through the site. No mitigation required.

e. In flood hazard, tsunamic, or seiche zones, risk release of pollutants due to project inundation? **No Impact.**

The Project Site is not located within a flood hazard, tsunamic, or seiche zone. The Project Site is elevated relative to its immediate surroundings, including the Santa Ana River. Therefore, there is no risk of a release of pollutants due to project inundation. No mitigation required.

f. Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan? **Less than Significant Impact.**

The Project Site is located in the Santa Ana Watershed, which is part of the San Bernardino County Stormwater Program and the San Bernardino Valley Regional Urban Water Management Plan (UWMP). The UWMP is a planning document to guide broad-perspective decision making by the management of local water suppliers. Under their stormwater program, San Bernardino County requires development of a WQMP for development projects. One of the purposes of the WQMP is to ensure incorporation of Low Impact Development (LID) measures that allow for infiltration into the soil. The Proposed Project will prepare a WQMP and comply with applicable water infiltration requirements, and therefore will not obstruct with implementation of a water quality control plan or sustainable groundwater management plan. No mitigation required.

4.10.2 Cumulative Impacts

The San Bernardino Valley Regional UWMP and Stormwater Program take a regional approach to water quality and hydrology. One of the purposes of these programs is to provide requirements and guidelines for individual projects. Compliance by each individual project within the covered region ensures regional planning initiatives are met. The Proposed Project will comply with site specific requirements relating to hydrology and water quality. Therefore, cumulative impacts of the Proposed Project plus past, present, and foreseeable future development will be less than significant.

4.11 LAND USE / PLANNING

Checklist Item		Potentially Significant Impact	Less Than Significant After Mitigation	Less than Significant Impact	No Impact
Would the project...					
a.	Physically divide an established community?	☐	☐	☐	☒
b.	Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒

4.11.1 Discussion

a. Physically divide an established community? **No Impact.**

The Project Site has been owned and maintained by Angelus for over two decades. The Project Site and the surrounding areas are located within the Agua Mansa Industrial Corridor in the City of Rialto. The Proposed Project would not alter or restrict access of existing travel routes or physically divide an established community. No mitigation is required.

b. Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect? **No Impact.**

The Proposed Project is located on property that has been owned and maintained by Angelus since the late 1990's. The Project Site is designated for General Industrial under the City of Rialto's General Plan. Additionally, the Project Site is located within the Agua Mansa Industrial Corridor, specifically in Sub-Area 8. The majority of Sub-Area 8, including the Project Site is zoned for Heavy Industrial uses. The Proposed Project is consistent with the land use designation under the Agua Mansa Specific Plan. Furthermore, Angelus currently operates a Recycle Plant on a portion of the Project Site, which is consistent with the Agua Mansa and City of Rialto industrial land use designations. The Proposed Project will continue using the property for industrial uses as designated in land use plans. Therefore, the Proposed Project will not cause any environmental impacts due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigation an environmental effect. No mitigation is required.

4.11.2 Cumulative Impacts

The Proposed Project will have no impact with regards to Land Use / Planning. The entirety of the Project Site is zoned for industrial uses under the City of Rialto General Plan. Additionally, the Project Site is located within the Agua Mansa Industrial Corridor. The Agua Mansa Specific Plan designated the Project Site for Heavy Industrial Use. The operations of the Proposed Project will align with both land use designations and do not conflict with any applicable land use regulations, land use policies, or land use planning documents. In conjunction with past, present, and reasonably foreseeable projects, impacts are not considered cumulatively considerable. No mitigation is required.

4.12 MINERAL RESOURCES

Checklist Item	Potentially Significant Impact	Less Than Significant After Mitigation	Less than Significant Impact	No Impact
Would the project…				
a. Result in the loss of availability of a known mineral resource that would be a value to the region and the residents of the state?	☐	☐	☒	☐
b. Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒

4.12.1 Discussion

a. Result in the loss of availability of a known mineral resource that would be a value to the region and the residents of the state? **Less than Significant Impact.**

The California Surface Mining and Reclamation Act of 1975 (SMARA) regulates surface mining operations to minimize adverse environmental impacts associated with mining as well as promotes the production, conservation, and protection of mineral resources. SMARA requires all cities to address significant aggregate resources identified by the State Geologist and designated by the State Mining and Geology Board in their General Plans. The City of Rialto General Plan established special land use designation to protect mineral resources within the city. Rialto is located within the alluvial plains of San Bernardino and San Gabriel Mountains, a region rich in aggregate resources.

The City General Plan identifies areas with significant aggregate resources into three mineral resource zones (MRZs). Land classified as MRZ-1 have no significant mineral deposits present or likely to be present. Land classified as MRZ-2 have significant mineral deposits present or have a high likelihood for their presence. Land classified as MRZ-3 cannot be determined for the significance of mineral deposits. The General Plan identifies the entirety of the Project Site as MRZ-3, an "area containing known or inferred mineral occurrences of undetermined mineral resource significance." According to the General Plan, no portions of the Project Site are in sectors designated by the State Mining and Geology Board (1987) as containing regional significant PCC-grade aggregated resources.

The California Geologic Energy Management Division (CalGEM, formerly DOGGR) is responsible for protecting public health, safety, and the environment with regards to oil, natural gas, and geothermal industries in conjunction with attaining climate change and clean energy goals for the state. To do so, CalGEM regulates the drilling, operation, and permanent closure of energy resource wells. California's oil and gas industry information is compiled into Well Finder, the online mapping application. According to Well Finder, there is no history of oil or gas wells within the Project Site (California Department of Conservation, 2019d). Well Finder maps two wells proximate to the Project Site. A plugged well is located approximately 0.7 miles northwest of the Project Site boundary and an idle "abandoned" well is located approximately 1 mile north of the Project Site boundary. The Proposed Project is not expected to affect either of these wells.

The Project Site is zoned for industrial uses under the City of Rialto General Plan and for heavy industrial uses under the Agua Mansa Specific Plan. There is no known history of aggregate mining on the property and the Project Site was not identified by the City of Rialto as having significant mineral deposits present. The law requires consideration of significant aggregate resources prior to land use determinations. Upon the classification of mineral resource areas, the City of Rialto designated the entire area of the Project Site to be used for industrial purposes. Therefore, the Proposed Project will result in a less than significant impact in the loss of availability of a known mineral resource that would be a value to the region and the residents of the state. No mitigation is required.

b. Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan? No Impact.

   The Proposed Project is not located on land delineated by the City of Rialto General Plan as a locally important mineral resource recovery site. The AMSP does not identify locally important mineral resource recovery sites. Therefore, the Proposed Project will have no impact on the loss of availability of a locally important mineral resource recovery site. No mitigation is required.

4.12.2 Cumulative Impacts

The Proposed Project would have no significant adverse impacts related to mineral resources in the region. Construction and operation of the Proposed Project would not result in the loss of availability of an area designated for mineral resource extraction. There is no known history of mineral resource extraction at the Project Site and the Proposed Project would have no direct or indirect, permanent, or temporary, impact on the extraction of mineral resources in the region. Therefore, the Proposed Project would not result in any cumulative effects to the loss of mineral resources that could be compounded with past, present, and reasonably foreseeable projects. No mitigation is required.

4.13 NOISE

Checklist Item	Potentially Significant Impact	Less Than Significant After Mitigation	Less than Significant Impact	No Impact
Would the project result in…				
a. Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☒	☐
b. Generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
c. For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

4.13.1 Discussion

a. Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies? **Less than Significant Impact.**

The City of Rialto General Plan included a Noise Element that established noise/land use compatibility guidelines in accordance with the California standard. The City of Rialto Noise Guidelines for Land Use Planning is presented in the figure on the following page.

In addition to the General Plan, the City of Rialto Municipal Code (Municipal Code) Chapter 9.50 outlines noise control ordinances for the city. Municipal Code Section 9.50.030 does not provide numeric maximum noise levels but prohibits making or knowingly and unreasonably permitting to be made any unreasonably loud, unnecessary or unusual noise that disturbs the comfort, repose, health, peace, and quiet or which causes discomfort or annoyance to any unreasonable person of normal sensitivity (Section 9.50.030 A7). Municipal Code Section 9.50.050 covers controlled hours of operation and prohibits loading or unloading any vehicle, or operate or permit the use of dollies, carts, forklifts, or other wheeled equipment that causes any impulsive sound, raucous, or unnecessary noise within a thousand feet of a residence outside the hours of seven a.m. and eight p.m. (Section 9.50.050B).

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	— 110 —	Rock band
Jet fly-over at 1000 feet		
	— 100 —	
Gas lawn mower at 3 feet		
	— 90 —	
Diesel truck at 50 feet at 50 mph		Food blender at 3 feet
	— 80 —	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawn mower, 100 feet	— 70 —	Vacuum cleaner at 10 feet
Commercial area		Normal speech at 3 feet
Heavy traffic at 300 feet	— 60 —	
		Large business office
Quiet urban daytime	— 50 —	Dishwasher next room
Quiet urban nighttime	— 40 —	Theater, large conference room (background)
Quiet suburban nighttime		
	— 30 —	Library
Quiet rural nighttime		Bedroom at night, concert
	— 20 —	
		Broadcast/recording studio
	— 10 —	
Lowest threshold of human hearing	— 0 —	Lowest threshold of human hearing

dBA = A-weighted decibels; mph = miles per hour

Source: California Department of Transportation, *Technical Noise Supplement*, September 2013.

Disturbances from construction activities are detailed in section 9.50.070 as such:

A. No person shall engaged or employees, or cause any other person to be engaged or employed, in any work of construction, erection, alteration, repair, addition, movement, demolition, or improvement to any building or structure except within the hours provided for by subsection B of this section.
B. Permitted hours for construction work:
    1. October 1st through April 30th
        - Monday – Friday 7 AM to 5:30 PM
        - Saturday 8 AM to 5 PM
        - Sunday – No permissible hours
        - State holidays – No permissible hours
    2. May 1st through September 30th
        - Monday – Friday 6 AM to 7 PM
        - Saturday 8 AM to 5 PM
        - Sunday – No permissible hours
        - State holidays – No permissible hours

The City of Rialto does not have any standards relative to ground-borne vibration. Caltrans has a guidance manual ("Transportation- and Construction-Induced Vibration Guidance Manual" dated June 2004) that provides thresholds for potential impacts on human comfort and damage to buildings that will be used to assess impacts due to ground-borne vibration. In most circumstances, common ground-borne vibrations related to roadway traffic and construction activities pose no threat to buildings or structures.

The primary existing noise sources surrounding the project site are traffic noises from S Riverside Avenue, Agua Mansa Road, and Interstate 10. Ambient noise measurements were conducted in the vicinity of the Proposed Site. The Project Site is surrounded by industrial areas and one single family residence located along Agua Mansa Road. about 450 feet east of the northeast portion of the site which is the only sensitive receptor near the project site. There are no other residential properties or sensitive receptors within a half mile radius of the site.

Project Construction Noise

Construction activities would result in a significant impact if they were to occur outside of the hours defined above and on Sundays and on State holidays. This project's construction is scheduled to take place during the permitted hours in the city of Rialto municipal plan. Noise impacts form the construction activities were evaluated by estimating the typical noise levels for each type of construction equipment using the Federal Highway Administration (FHWA) Roadway Construction Noise Model (RCNM) and comparing the L_{eq} at the nearest sensitive receptor (R1) with the ambient noise levels from the field measurement.

Estimated usage was estimated for each expected equipment from the construction activities as shown in Table 1, Maximum Noise Levels and Estimated Usage of Typical Construction Equipment. Each type of construction equipment produces a maximum noise levels (L_{max}) at a reference distance of 50 feet from the noise source.

Table NOI-1: Maximum Noise Levels and Estimated Usage of Typical Construction Equipment.

Type of Equipment	Estimated Usage (%)	L_{max} at 50 feet (dBA)
Tractor	40	84
Backhoe	40	77.6
Crane	16	80.6
Dozer	40	81.7
Grader	40	85
Excavator	40	80.7
Man Lift	20	74.7
Welder / Torch	40	74
Generator	50	80.6
Paver	50	77.2

Type of Equipment	Estimated Usage (%)	L_{max} at 50 feet (dBA)
Roller	20	80
All Other Equipment > 5 HP	50	85

Noise levels generated by construction equipment (or by any point source) decrease at a rate of approximately 6 A-weighted decibels (dBA) per doubling of distance from the source. The only residence in the vicinity of the site (R1) is located approximately 650 feet from the location where the construction activities would take place. Using the RCNM, the noise levels were calculated for R1 at 650 feet from the construction equipment, as presented in Table NOI-2, Predicted Construction Noise Levels at Nearest Sensitive Receptor (R1).

Table NOI-2: Predicted Construction Noise Levels at Nearest Sensitive Receptor (R1).

Phase	Duration	Expected Equipment	Leq at R1 (650 feet) (dBA)	Ambient Noise Level at R1	Significant Impact
Site Preparation	1 Month	Tractors/Loaders/backhoes, dozers	60.3	68.4	No
Grading	2 Month	Graders, dozers, tractors/loaders/ backhoes, excavators	63.2	68.4	No
Building Construction	12 Months	Cranes, lifts, tractors/loaders/backhoes, welders, generator sets	61	68.4	No
Paving	2 Months	Pavers, rollers, tractors/loaders/backhoes, cement mixers, and other paving equipment	62.9	68.4	No

As shown in Table NOI-2, the highest noise levels at R1 will during the grading activities when noise levels from construction activities would be as high as 63.2dBA. The ambient noise levels at the residence was measured at 68.4dBA which is higher than the highest expected noise from construction activities. Construction activities would be required to comply with the City's allowable construction hours as described above and would be temporary in nature. Therefore, noise impacts from construction are considered less than significant.

<u>Project Operation Noise</u>

The potential for a substantial permanent increase in noise levels was assessed for both mobile and stationary sources. The City of Rialto does not have numeric maximum noise levels not to exceed but prohibits unreasonable noise. A significant impact related to operational noise would result if:

> *The Project would cause ambient noise levels to increase by 5 dBA, Community Noise Equivalent Level (CNEL) or more and the resulting noise falls on a noise-sensitive land use within an area categorized "normally acceptable" (see Exhibit 2 for description of these categories); or cause ambient noise levels to increase by 3 dBA, CNEL or more*

and the resulting noise falls on a noise sensitive land use within an area categorized "conditionally acceptable", "normally unacceptable" or "clearly unacceptable".

Operational Mobile Noise

The Project would generate traffic along adjacent roads including Fortuna Way, Industrial Drive, S Riverside Avenue and Agua Mansa Road. Operational mobile noise levels for the Proposed Project were assessed and are summarized in Table NOI-3 below:

Table NOI-3: Project-Related Mobile Noise.

Modeled Receptor	Key Roadway Segment	Existing + Growth Noise Level (dBA CNEL)	Existing + Growth + Project Noise Level (dBA CNEL)	Noise Level Increase (dB)
R1- Residence on Agua Mansa Road (east of project)	Agua Mansa Road – S Rancho Avenue to S Riverside Avenue	64.9	64.9	0

The increase in noise from mobile sources attributed to the proposed project would be less than 3 dBA on the local roadway that the project trips would result in a perceptible change in sound level for a person with normal hearing sensitivity. Therefore, the Proposed Project would result in a less than significant impact related to operational traffic noise.

Operation On-Site Stationary Noise

On-site stationary noise sources include forklifts, front loader, truck loading and parking. Noise sources were modelled using SoundPlan Essential 5.0 software and the results are summarized in Table NOI-4 and Table NOI-5 below:

Table NOI-4: Source Sound Power Levels in Octave Band Format (dB, re 10-12W)

Equipment / Source[1]	Level (dBA)	Octave Band Centre Frequency (Hz), Sound Power Levels (dBA)							
		63	125	250	500	1,000	2,000	4,000	8,000
Front Loader	112.9	84.8	100.9	111.4	104.7	99	98.2	93	84.9
Forklift	100	81.6	85.6	89.6	92.6	95.6	93.6	88.6	83.6
Trucks - Entrance Path	77	58.5	62.5	66.5	69.5	72.5	70.5	65.5	60.5
Trucks - Exit Path	77	58.5	62.5	66.5	69.5	72.5	70.5	65.5	60.5
[1] Noise levels for each source were from SoundPlan Essential noise reference library.									

Table NOI-5: Source Sound Power Levels – Parking Lots

Name	Size	Unit	Movements per hour			Road surface	L_w,ref (dBA)
			Day	Evening	Night		
Employee and customer parking	40	Parking bays	1	0	1	Asphaltic driving lanes	82.7

Based on this noise analysis of the operational on-site stationary noise, the noise level at the residence would be 59.9 dBA L_{eq} during the daytime and 58.7dBA L_{eq} during the nighttime as the activities on site are supposed to operate from 4am to 10pm. The measured ambient noise level at the residence was 68.4dBA L_{eq}, therefore the noise from the on-site activities are not expected to be a disturbance for the residence as required by the City of Rialto municipal code. The acoustical impact of the stationary noise for the proposed project would be less than significant.

Permanent Noise Impact Analysis

Mobile Sources

A Proposed Project would be considered to have a substantial impact on ambient noise levels if the combined effect exceeds the perception level threshold of 3dB. The combined effect compares the "existing with project" condition to the "existing" conditions. As discussed above, the Proposed Project related traffic would not result in an increase in noise exceeding the threshold in the vicinity of the project. Therefore, noise impact from increased traffic (mobile sources) would be less than significant

Stationary Sources

Long-term operational noise from the project would consist of stationary sources such as trucks, forklifts, vehicle on site traffic (cars), and one loader. The worst-case scenario would be a situation in which all sources operate simultaneously, which would result in a noise level of 59.9dBA at the closest residence. The ambient noise level at the residence was measured at 68.4dBA. Therefore, the combined noise levels are expected to be 69dBA, which is an increase of 0.6dB from the current noise levels. An increase of less than 3dB is considered to be less than significant, therefore the increase in noise levels from the Proposed Project's stationary sources would be less than significant.

Temporary Noise Impact Analysis

Construction Temporary Noise Impact

Construction hours for the Proposed Project will be temporary and limited according to the Municipal Code, from October 1st through April 30th: Monday – Friday 7 AM to 5:30 PM and Saturday 8 AM to 5 PM and form May 1st through September 30th: Monday – Friday 6 AM to 7 PM and Saturday 8 AM to 5 PM.

Noise levels are expected to be highest during the paving phase, when the combined noise levels of construction noise and the existing noise levels will be 69.5dBA at the residence which is 1dB over the current ambient noise levels. Since temporary increase in ambient noise levels is less than 3dB, therefore the noise from temporary construction activities will be less than significant.

b. Generation of excessive groundborne vibration or groundborne noise levels? **Less than Significant Impact.**

Vibration is periodic motion of a solid medium in alternately opposite directions from the position of equilibrium in which the motion's amplitude can be described in terms of displacement, velocity, or acceleration. The peak particle velocity (PPV) or the root mean square (RMS) velocity is usually used to describe vibration amplitudes. The PPV is defined as the maximum instantaneous peak or negative peak of the vibration wave. The RMS is defined as the square root of the average of the squared amplitude of the signal. PPV is the most commonly used descriptor for evaluating potential building damage, whereas RMS is generally used to assess human response. Typically, ground-borne vibration, generated by man-made activities, attenuates rapidly with distance from the source of vibration. Man-made vibration issues are therefore usually confined to short distances (i.e., 500 feet or less) from the source. Operation of construction equipment, maintenance operations and traffic traveling on roadways can generate ground-borne vibration. In order to assess the human response in relation to ground vibrations, the *Guideline Vibration Annoyance Potential Threshold Criteria* developed by Caltrans was used.

Ground-borne Vibration During Construction

Because construction activity is short-term and equipment moves around a project site, the primary concern regarding construction vibration relates to building damage. Activities that can result in damage include demolition and site preparation in close proximity to sensitive structures. This project site is not expected to do any demolition. The site preparation activities will take place all over the project site which is located at least 100 feet from the closest structure.

Caltrans, Transportation- and Construction-Induced Vibration Guidance Manual (2020), has developed damage potential threshold criteria for typical building structure and condition. For older residences, the maximum PPV inches per second (in/sec) is 0.3 and for commercial buildings the maximum PPV in/sec is 0.5. Vibration is a localized event and attenuates rapidly with distance and at this distance vibration damage would not occur. Based on the guidance document published by the Federal Transit Administration, Transit Noise and Vibration Impact Assessment (September 2018), a large bulldozer would generate vibration levels of 0.089 in/sec at 25 feet. Construction equipment would not operate within 100 feet of an existing, off-site building. The maximum vibration level at 100 feet would be 0.011 inches per second. Therefore, the proposed project would result in a less than significant impact related to building damage from construction vibration.

Ground-borne Vibration During Operations

The Proposed Project is not expected to operate heavy-duty industrial equipment. Trucks and cars are not expected to generate any perceptible vibration levels outside of the right-of-way. There are no operational sources of vibration that would generate vibration levels that exceed 0.04 in/sec. Therefore, the Proposed Project would result in a less than significant impact related to operational vibration, and no mitigation is required.

c. For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels? No Impact.

   The Proposed Project is not located within an airport land use plan nor is it located within two miles of a public airport or public use airport. The nearest airport, San Bernardino International Airport, is located approximately 7 miles to the northwest of the Project Site. Therefore, the Proposed Project would not result in a safety hazard for people residing or working in the project area. No impact would occur, and no mitigation is required.

4.13.2 Cumulative Impacts

A noise impact study was performed for the Proposed Project to evaluate the impacts of construction and long-term operation of the Proposed Project on the surrounding areas by comparing the existing noise environment with the projected noise levels from the Proposed Project. As discussed above, the noise impact study determined that the cumulative impacts relative to temporary and permanent noise generation associated with construction and operation of the Proposed Project would not be cumulatively considerable. The Proposed Project, in conjunction with past, present, and foreseeable future projects would be less than significant.

4.14 POPULATION / HOUSING

Checklist Item	Potentially Significant Impact	Less Than Significant After Mitigation	Less than Significant Impact	No Impact
Would the project...				
a. Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☒	☐
b. Displace substantial numbers of existing people or housing necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

4.14.1 Discussion

a. Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)? **Less than Significant Impact.**

The Proposed Project does not propose new housing but does propose a new business purpose and can be classified as such. The Proposed Project plans to construct a Manufacturing Building, Admin Building, Industrial/Shop Building, Storage Warehouse Building, Metal Canopy Structure, parking lot, and product and material storage areas. The construction is expected to take approximately 18 months. During the construction phase, the Proposed Project will employ a maximum of 75 workers per shift.

Once operational, the Proposed Project is expected to employ approximately 50 full-time employees per shift and a maximum of 70 full-time employees and 5 part-time employees per shift. The Proposed Project will be operated in two shifts per day. The normal operating schedule will be 18 hours per day, 5 days per week, and 52 weeks per year. The maximum operating schedule will be 20 hours per day, 6 days per week, and 52 weeks per year.

The employees are expected to live in the general vicinity of the Project Site and commute to the work. The addition of 140 full-time positions would not result in a significant population, housing, and employment impact to the region. Construction of the Proposed Project does not involve extension of roads or other infrastructure. As of the 2010 Census, the City of Rialto had a population of 99,171, while the estimate for the population in 2019 was 103,526 (United States Census Bureau). Due to the size and nature of the Proposed Project, it is not expected cause substantial population growth in the surrounding area either directly or indirectly. Therefore, impacts will be less than significant. No mitigation is required.

b. Displace substantial numbers of existing people or housing necessitating the construction of replacement housing elsewhere? **No Impact.**

The Project Site is zoned for Heavy Industrial use by the Agua Mansa Specific Plan and for General Industrial use by the City of Rialto General Plan. The Project Site does not contain any housing; therefore, construction of the Proposed Project will not displace any existing people or housing. The Proposed Project will have no impact on housing displacement. No mitigation is required.

4.14.2 Cumulative Impacts

The Proposed Project aims to construct and operate a new concrete block manufacturing facility on land that has been owned and operated by Angelus. The Project Site does not contain any housing structures and therefore would not displace any existing people or homes on or in the area of the Project Site. The Proposed Project will employ a comparable number of employees to a Project of a similar size located in the Agua Mansa Industrial Corridor and is not expected to generate significant effects on the population or population distribution of the City of Rialto and surrounding cities. Construction and operation of the Proposed Project will not result in substantial unplanned population growth in any area, either directly or indirectly. Therefore, the Proposed Project would not result in any cumulative effects with regards to population and housing that could be compounded with past, present, and reasonably foreseeable projects and impacts are considered less than significant. No mitigation is required.

4.15 PUBLIC SERVICES

Checklist Item	Potentially Significant Impact	Less Than Significant After Mitigation	Less than Significant Impact	No Impact
Would the project…				
a. Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objective for any of the public services:				
i. Fire protection?	☐	☐	☒	☐
ii. Police protection?	☐	☐	☒	☐
iii. Schools?	☐	☐	☐	☒
iv. Parks?	☐	☐	☐	☒
v. Other public facilities?	☐	☐	☐	☒

4.15.1 Discussion

a. Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objective for any of the public services:

i. Fire protection? **Less than Significant Impact.**

The City of Rialto is served by the Rialto Fire Department (RFD). RFD deploys from five fire stations within the City of Rialto: Fire Station 201, Fire Station 202, Fire Station 203, Fire Station 204, and Fire Station 205. The Project Site falls within the jurisdiction of Fire Station 205, which began operating in 2020. Fire Station 205 is located at 1485 S. Willow Avenue, approximately 2 miles northeast of the Project Site. RFD staffs one battalion chief, three engine companies, one truck company, and four paramedic ambulances each day.

The Project Site is located near the City of Colton. The Colton Fire Department (CFD) may also be deployed to the Project Site during emergencies involving structure and vegetation fires as well as higher acuity medical emergencies that use Automatic Vehicle Location (AVL). In scenarios where a CFD apparatus is closer than an RFD apparatus, the CFD would be deployed. CFD Station 211 is located approximately 3 miles northeast of the Project Site. CFD Station 214 is located approximately 3.5 miles east of the Project Site.

Furthermore, San Bernardino County Fire provides community-based hazard emergency services throughout San Bernardino County. The Project Site is located within the Service Area of Fontana, Station #77 located at 17459 Slover Avenue, Bloomington, CA (San Bernardino County Fire, 2020).

The Proposed Project is not expected to increase demand for Fire Protection services to the extent of requiring an additional station or facilities. Impacts on service ratios, response times, and other applicable performance objectives for fire response as a result of the Proposed Project is not expected to be discernable. The Proposed Project will have a less than significant impact on Fire Protection services. No mitigation is required.

ii. Police protection? **Less than Significant Impact.**

The Rialto Police Department (RPD) provides law enforcement services to the City of Rialto where the Proposed Project is located. The Proposed Project is located within RPD Area Command 4, directed by Lieutenant Dean Hardin, which covers everything south of Foothill Boulevard and east of Lilac Street. The RPD is located at 128 N Willow Avenue, approximately 3.7 miles northeast of the Project Site. RPD currently employs 176 employees and services 28.5 square miles.

The Proposed Project is located in an industrial area that is regularly patrolled by RPD. The entire perimeter of the Proposed Project will be secured with fences and gates that are kept locked outside of operating hours. Lights and video surveillance cameras will be placed throughout the facility to further enhance security. The Proposed Project is not expected to create a need for additional law enforcement. Construction and operation of the Proposed Project will not disrupt acceptable service ratios, response times, or other performative objective for Police protection. Therefore, the Proposed Project will have less than significant impacts associated with Police protection in the City of Rialto and the surrounding area. No mitigation is required.

iii. Schools? **No Impact.**

The Proposed Project is located in an area zoned for industrial use. There are no schools in the vicinity of the Project Site. Construction and operation of the Proposed Project would not result in adverse physical impacts on the Rialto School District or any other schools in the general vicinity of the Proposed Project. The nearest school, Crestmore Elementary at 18870 Jurupa Ave, Bloomington, CA, is located approximately 1.6 miles to the west of the Project Site.

The Proposed Project will not lead to a discernable increase in the number of families with school-age children in the area. Therefore, it is unlikely that construction and operation of the Proposed Project would impact performance objectives for schools in the area. No mitigation is required.

iv. Parks? No Impact.

There are no parks located within a 2-mile radius of the Proposed Project. The closest parks are Reid Park-Ruth H Lewis Center, Kessler Park, Rialto City Park all located approximately 2.2 miles south, west, and north respectively.

The Proposed Project is not expected to increase demand for parks or other recreational areas in the vicinity the Project Site. The Proposed Project will not lead to a discernable change in the population of the area and would not generate in increase in demand for parks. The Proposed Project will have no impact on Parks.

v. Other public facilities? No Impact.

There are very limited public facilities located in the vicinity of the Project Site. As noted in part iv), there are no parks and recreational facilities located within a 2-mile radius of the Proposed Project. The nearest public library is the Luque Branch Library, part of the Colton Public Library, located at 294 E O Street, Colton, CA, approximately 2.5 miles east of the Proposed Project. The main branch of the Colton Public Library located at 656 N 9th Street, Colton, CA, approximately 3 miles northeast and is the second closest public library. The Proposed Project does not contain any residential components that would have a direct effect on the use of public facilities. Furthermore, the Proposed Project is not expected to have a discernable impact on population of the surrounding area. Therefore, the Proposed Project will have no impact on other public facilities.

4.15.2 Cumulative Impacts

The Proposed Project is not expected to result in substantial adverse physical impacts associated public services in the surrounding area. The Proposed Project will not lead to the need for new or physically altered governmental facilities to maintain performance objectives for different public services, including fire protection, police protection, schools, parks, and libraries. The Proposed Project is would not result in incremental effects to public services that in conjunction with past, present, and reasonably foreseeable projects, would result in adverse significant impacts. Therefore, the Proposed Project would not result in cumulatively considerable impacts to public services or facilities.

4.16 RECREATION

Checklist Item	Potentially Significant Impact	Less Than Significant After Mitigation	Less than Significant Impact	No Impact
Would the project…				
a. Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒
b. Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☒

4.16.1 Discussion

a. Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated? **No Impact.**

The Proposed Project is located in an area designated for industrial uses and is not directly adjacent to any parks or recreation areas. The closest parks are approximately 2.2 miles away from the Project Site. The Proposed Project will employ a maximum of 150 employees once operational. Employees are expected to be hired from the existing labor pool in the area and the Proposed Project will not result in a mass relocation. Therefore, the Proposed Project will pose no impact on the use of existing recreational facilities in the vicinity. No mitigation is required.

b. Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment? **No Impact.**

The Proposed Project does not include recreations facilities or require the construction or expansion of recreational facilities. Therefore, the Proposed Project will have no impact regarding physical effects on the environmental related to recreation. No mitigation is required.

4.16.2 Cumulative Impacts

The Proposed Project is located in an area designated for industrial use. The closes recreational facilities are over 2 miles away. The Proposed Project will not increase the use of existing neighborhood and regional parks such that substantial physical deterioration of the facility would occur or be accelerated. Furthermore, the Proposed Project does not include recreational facilities or require the construction or expansion of recreational facilities. The Proposed Project, in conjunction with past, present, and reasonably foreseeable projects, will have no cumulative impact on recreation. No mitigation is required.

4.17 TRANSPORTATION

Checklist Item	Potentially Significant Impact	Less Than Significant After Mitigation	Less than Significant Impact	No Impact
Would the project...				
a. Conflict with program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities?	☐	☒	☐	☐
b. Conflict or be inconsistent with CEQA Guidelines 15064.3, subdivision (b)?	☐	☐	☒	☐
c. Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒
d. Result in inadequate emergency access?	☐	☐	☒	☐

4.17.1 Discussion

a. Conflict with program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities? **Less than Significant After Mitigation.**

The Proposed Project is located within the Agua Mansa Industrial Corridor and zoned for industrial activity. A Traffic Impact Study (TIS), included in Appendix H, was prepared to address the traffic-related impacts of the Proposed Project. The TIS was conducted in accordance with the City of Rialto's *Traffic Impact Analysis Report Guidelines and Requirements* (December 2013) and the San Bernardino County Transportation Authority (SBCTA) Congestion Management Program (CMP). The State of California adopted Senate Bill (SB) 743 which changed the method of traffic analysis required through CEQA for publicly and privately initiated projects. The law changed the way local jurisdictions, like the County of San Bernardino, analyze transportation impacts from development projects and identify mitigation measures to reduce those impacts. SB 743 became effective on July 1, 2020. The City of Rialto's VMT Analysis Guidelines are currently in development, therefore, the County of San Bernardino's Transportation Impact Study Guidelines (2019) were used. The County of San Bernardino uses Vehicle Miles Travelled (VMT) as the new analysis metric.

The guidelines require a VMT analysis be conducted if a project generates over 110 trips per day. According to the TIS, the project is anticipated to generate 1,270 passenger car equivalent daily trips per day. Based on the County's 110 daily trip threshold, the project is required to evaluate VMT per employee to determine the project's impact to VMT. Industrial projects are evaluated based on VMT/employee and are considered to have significant impacts when the VMT/employee for the project exceeds the regional average VMT/employee. Employee based VMT for the Proposed Project is 107.8 which is higher than the regional average of 27.2. Therefore, the Proposed Project's potential traffic significance was evaluated for the project buildout year (2022) and for the San Bernardino Transportation Analysis Model (SBTAM) horizon model year (2040) to determine buildout year and cumulative impacts.

According to the County of San Bernadino's Traffic Study Guidelines (2019), a project that has a higher VMT per person/employee than the regional average should be mitigated to 4% below the baseline VMT. The project therefore is required to reduce the project VMT to 4% below the Baseline 2022 Condition for a resulting VMT of 18.22. No mitigation is required for the 2040 Cumulative Condition.

Based on the County guidelines, projects that are over the VMT threshold should consist of Transportation Demand Management (TDM) measures analyzed under a VMT-reduction methodology consistent with Chapter 7 of the California Air Pollution Control Officers Association (CAPCOA) Quantifying Greenhouse Gas Mitigation Measures (August 2010). The following TDM measures will be implemented with the project and are feasible based on the project site land use and operation.

- Commute Trip Reduction
  Applying TRT-1 from CAPCOA: Implement Commute Trip Reduction Marketing
  This includes existing and new employee orientation of trip reduction and alternative mode options and disbursement of alternative mode choice marketing materials and resources (100% of employees eligible). Additionally, the project will provide a Transportation Coordinator to distribute TDM information to existing employees and new hires, and provide priority parking for vanpool/carpool participants.

- Ride Share Program
  Participation in the County of San Bernadino's Carpool and Vanpool Ride-Matching Services and encouragement for employees to participate in the program.

- Preferential Parking Permit Program
  The project will provide preferential parking spaces to carpool and vanpool participants, this measure compliments TRT-1 and TRT-3 therefore no reduction was applied to avoid double counting.

Additional VMT reduction strategies the project is committed to include a 25% Local Hiring Commitment. The Local Hiring Commitment guarantees at least 25% of employees will be located within the City of Rialto and adjacent cities, creating more internalized trips, and supporting the goals of SB 743. Based on sociodemographic data within the City's boundaries, the average distance of travel to the site is 11.93 miles. The local hiring commitment would include any jurisdiction within that limit. Based on the average VMT per employee, creating employment opportunities in the City is an effective VMT reducing measure bringing the average VMT to 18.87 miles with a 25% local hiring commitment. The VMT per employee therefore would be below the Baseline 2022 without Project condition.

The TIS includes a discussion of existing (2020) traffic volumes, future (2022) traffic volumes, trip generation, directional distribution, and the impacts of new traffic at the study intersections. The City of Rialto *Traffic Impact Analysis Report Guidelines and Requirements* (Rialto Traffic Guidelines) requires analysis of traffic operations to be based on the vehicular delay methodologies of the Highway Capacity Manual (HCM). Per the HCM Methodology, Level of Service (LOS) for signalized intersections is defined in terms of average vehicle delay. Specifically, LOS criteria are stated in terms of the average control delay per vehicle for the peak 15-min period within the hour analyzed.

The Rialto Traffic Guidelines reference the General Plan minimum LOS standards. According to Policy 4-1.20 of the General Plan document, city streets with signalized intersections are required to operate at LOS D or better during peak hours. The one exception being Riverside Avenue which can operate at LOS E, Riverside Avenue is part of this study. Policy 4-1.21 of the General Plan document states that unsignalized intersections operate with the average delay being 120 seconds or less during the peak hours. The Rialto Traffic Guidelines requires a new development to mitigate impacts that cause the Level of Service to fall below LOS D (E for Riverside Avenue), or the peak hour delay to increase as follows:

- LOS A/B – by 10.0 seconds
- LOS C – by 8.0 seconds
- LOS D – by 5.0 seconds
- LOS E – by 2.0 seconds
- LOS F – by 1.0 second

The roadway segment analysis addresses the Proposed Project's impact on daily operating conditions on roadway segments within the vicinity. Roadway segments are evaluated by comparing the daily traffic volume on the roadway segment to the daily capacity of that segment, to determine the volume-to-capacity (v/c) ratio. Daily capacity is based on roadway classifications.

The TIS summarizes the data collected, background and projected traffic at the study locations, analysis of traffic impacts including levels of service (LOS), assessment of the site entrance, and conclusions/recommendations from the analysis.

Due to the state-mandated lock-down starting in March 2020 (implemented as a result of the COVID-19 pandemic), traffic patterns have been irregular near the Proposed Site. Obtaining new counts for what the traffic engineering industry constitutes as "normal" conditions has not been feasible. Because new traffic counts were not feasible, historic traffic counts taken before March of 2020 were obtained from the City of Rialto as well as from local traffic counting companies. All historic counts obtained are from 2018 and 2019. To establish an existing base year 2020 traffic network, a 2% growth rate per year was applied to the historic counts. The TIS study area included eight intersections; historic counts were obtained for seven of them.

Because the site is considered a "truck-intensive" land-use per the Rialto Traffic Guidelines, all existing traffic counts were converted to passenger car equivalent (PCE) trips. This process is used to incorporate heavy truck usage into the operational analysis of the transportation network. Intersection LOS analysis was conducted for the AM and PM peak hours and the results are presented in Appendix H.

Transit service in Rialto, California is provided by OmniTrans transit lines, which serve various San Bernardino cities in the area. There are no bus stops within half a mile of the Project Site Therefore, the Proposed Project will not interfere with any program, plan, ordinance, or policy regarding public transit service in the vicinity.

The Circulation Element refers to the General Plan for roadway designations for the project and the surrounding facility. The General Plan was approved in 2010. Project truck traffic is assumed to use the designated truck route on Riverside Avenue to access the freeway. Beyond the area shown Cedar Avenue continues as a truck route to the north (changing name to Ayala Drive at Baseline Road). Santa Ana Avenue, I-10, and Valley Boulevard continue both east and west as truck routes.

The TIS indicates that the Proposed Project does not cause significant impact at any of the intersections within the study area except for the following location: S Riverside Avenue at Slover Avenue. In order to mitigate this potentially significant impact, the following mitigation is proposed:

Mitigation Measure TRA-1: Development Impact Fee for Intersection and Roadway Improvements

The mitigations proposed in the TIS coincide with the City of Rialto General Plan. The City's Development Impact Fee (DIF) document includes the widening of Riverside Dr between I-10 eastbound ramps and Agua Mansa Rd. According to the DIF from 2016 the total cost of the widening of Riverside Dr is $40,429,920. The bridge widening associated with this project already has funding at $15,000,000 allocated for it. The remaining balance of $25,429,920 was utilized for fair share calculations.

Intersection specific improvements to S Riverside Avenue at Slover Avenue are also included in the DIF Nexus Study with a separate cost of $355,200. While there are no specific cost estimates associated with the other two significantly impacted intersections, the cost estimate for S Riverside at Slover Avenue was utilized to calculate the fair share cost associated with the other two significantly impacted intersections.

Based on the fair share calculation, the City of Rialto is owed $724,397.81 in fair share costs as part of the permitting process for the Proposed Project.

b. Conflict or be inconsistent with CEQA Guidelines 15064.3, subdivision (b)? Less than Significant Impact.

Section 15064.3 of the 2019 California Environmental Quality Act Statute and Guidelines (CEQA Guidelines) distributed by the Association of Environmental Professionals (AEP) describes the specific considerations for evaluating a project's transportation impacts (AEP, 2019). Vehicle Miles Travelled (VMT) is generally the most appropriate measure of transportation impacts. Other considerations include the effects of the Proposed Project on public transit and non-motorized travel. The CEQA Guidelines clearly state that a Proposed Project's effect on automobile delay shall not contribute a significant environmental impact. As discussed in part a., the Proposed Project will implement mitigation measures to maintain LOS requirements and VMT reduction measures to be consistent with CEQA guidelines.

c. Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)? No Impact.

The site driveways and project improvements are designed such that adequate sight distance for drivers entering and exiting is maintained. Because these driveways are at the end of the cul-de-sac on Fortuna Way, they act as an extension of the roadway recuing the need for sight distance as there are no conflicting movements.

Nevertheless, adequate sight distance must be maintained at both driveways. The line of sight, a straight line between the driver's eye and oncoming vehicles on the adjacent roadway, defines the Limited Use Area. The Limited Use Area for each driveway must be kept clear of visual obstructions, including project signs, building structures, and landscaping, in order to maintain adequate sight distance.

Furthermore, the Proposed Project has no geometric design features or incompatible uses that would increase hazards at or within the vicinity of the Project Site. The design of the Proposed Project does not interfere with existing intersections within the vicinity of the Project Site. Due to the truck-intensive nature of the Proposed Project, there will be no sharp curves located on the Project Site. The Proposed Project is in line with the designated industrial land use of the Project Site and will not lead to any incompatible land uses. Therefore, the Proposed Project will have no impact on substantially increasing hazards in this regard and no mitigation is required.

d. Result in inadequate emergency access? Less than Significant Impact.

The TIS concluded that additional traffic resulting from the Proposed Project will not have a significant impact on all studied intersections, which will continue to operate with an LOS E or better. However, the TIS found that all daily roadway segments are operating over capacity with an LOS F; therefore, roadway segment mitigation will be implemented to reduce impacts to a less than significant level. Additionally, due to existing regulations requiring traffic to make way for emergency vehicles, roadway segments should not impede emergency access in the area. All vehicular access into and out of the Project Site will occur via one gate at the Terminus of Fortuna Way.

The results of the roadway analysis for existing conditions indicates that the study roadway segments are currently all operating at capacities above the acceptable LOS threshold. This means that in existing conditions, all roadway segments do not meet the General Plan Guidelines, and the Proposed Project will not pose a significant impact compared to existing conditions.

4.17.2 Cumulative Impacts

The Traffic Impact Analysis was prepared to address the cumulative impacts of the Proposed Project, including those that were Project-specific and those generated by the Proposed Project, related to traffic and transportation. The TIS found that the Proposed Project would have a significant impact on the five roadway segments studied that are already operating above capacity that can be mitigated to a less than significant level. The Proposed Project will have a less than significant impact on both signalized and unsignalized intersections in the vicinity. The Proposed Project was designed to such that once operational, the Proposed Project will not increase hazards due to a geometric design feature or incompatible uses. Construction and operation of the Proposed Project will have no impact on impeding emergency access in the area. The Proposed Project, along with past, present, and reasonably foreseeable projects will not generate significant cumulative impacts after implementation of mitigation measures with regards to traffic and transportation in the area.

4.18 TRIBAL CULTURAL RESOURCES

Checklist Item	Potentially Significant Impact	Less Than Significant After Mitigation	Less than Significant Impact	No Impact
Would the project…				
a. Would the project cause of substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				
i. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or	☐	☐	☒	☐
ii. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	☐	☒	☐

4.18.1 Discussion

a. Would the project cause of substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

   i. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or

   As discussed in Section 4.5, a records search was performed using the California Historical Resources Information System (CHRIS). The records search resulted in the identification of the Agua Mansa Cemetery and two linear features. Cultural resources survey was conducted in compliance with CEQA requirements. No cultural resources were encountered during this work. The Cultural Resources Assessment is provided as Appendix E.

Based on the results of the Cultural Resource Assessment, discovery of architectural materials is unlikely. However, due to the proximity to the Agua Mansa Cemetery, an Inadvertent Discovery Plan will be implemented. If human remains are encountered during excavation or other ground disturbing activities, work in and around the remains must halt and the San Bernardino County coroner notified and provisions of the State Health and Safety Code §7050.5. As such, impacts will be less than significant.

ii. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

There are no features or items within ¼ mile of the Project Site that are known to be a significant resource to a California Native American Tribe. Development always presents the potential to expose previously undetected subsurface cultural resources during construction. If this should occur, all construction will cease, and a qualified archaeologist will be consulted. Following this protocol will result in less-than-significant impacts.

4.18.2 Cumulative Impacts

There are very few archaeological resources within ¼ mile of the Project Site. Development of the Proposed Project is not expected to have significant effects on tribal resources. Projects throughout the state may discover and/or disturb known and unknown tribal resources. However, policies have been established to protect these resources as they are found. Therefore, impacts from the Proposed Project plus foreseeable past, present, and future projects would not have significant cumulative impacts.

4.19 UTILITIES / SERVICE SYSTEMS

Checklist Item	Potentially Significant Impact	Less Than Significant After Mitigation	Less than Significant Impact	No Impact
Would the project...				
a. Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	☐	☐	☒	☐
b. Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiply dry years?	☐	☐	☒	☐
c. Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☒	☐
d. Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	☐	☐	☒	☐
e. Comply with federal, state, and local statutes and regulation related to solid waste?	☐	☐	☒	☐

4.19.1 Discussion

a. Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects? **Less than Significant Impact.**

Wastewater services will be provided by Rialto Water Services (RWS). A 30-year concession agreement from 2012 allows the City of Rialto to "retain full ownership of water and wastewater systems, retains all water rights and supply, and possesses the rate-setting authority associated with the facilities" (RWS, 2020). RWS provides the financial backing and Veolia North America (Veolia) delivers all water and wastewater services.

The wastewater lift station for the Proposed Project and the surrounding area is located on Agua Mansa Road. Wastewater from the Project Site will be treated at the Veolia's wastewater treatment facility located at 501 East Santa Ana Avenue, approximately 0.5 miles north of the Project Site. The treatment facility has a maximum daily throughput of 11.7 million gallons. Rialto generates approximately 7-8 million gallons of wastewater daily

(California Water News Daily, 2017). The Proposed Project is not expected to generate a significant volume of wastewater. Water will be added to the mixers in order to create concrete, but wastewater generated from this process is minimal. The primary source of wastewater from the facility will be greywater from bathrooms and locker rooms. Wastewater treatment facilities are equipped to handle the nominal increase in wastewater generated by the Proposed Project. Therefore, the Proposed Project will not result in the relocation or construction of additional wastewater treatment facilities.

As previously mentioned in the Section 10 Hydrology and Water Quality, the Proposed Project will occupy approximately 32 acres, triggering the requirement to obtain coverage under the IGP and development of a Storm Water Pollution Prevention Plan (SWPPP). Conformance with the BMPs outlined in the SWPPP will prevent adverse effects will prevent adverse impacts to water quality during construction of the Proposed Project. The Project Site will be paved with interlocking impervious pavers, which will allow infiltration int the soil below. The site has been designed to accommodate an 85th percentile, 24-hour storm flow. Excess volumes will be discharged to existing storm drain infrastructure. Therefore, the Proposed Project will have a less than significant impact with regards to storm water drainage.

Electricity in the City of Rialto is provided by Southern California Edison and gas is provided by Southern California Gas Company (SoCalGas) (City of Rialto, 2019). SoCalGas owns and operates several natural gas storage fields in Southern California. The California Public Utilities Commission (CPUC) regulates natural gas utilities operating in California. The CPUC must approve all rates that each electric utility charges customers. Operation of the Proposed Project will utilize natural gas in the curing chambers, which are operated at approximately 140°F and have a total heat input capacity up to 3 mmBTU per hour. This consumption of natural gas will not have a significant impact on natural gas facilities in the area.

The City of Rialto's local cable/phone/internet service is provided by Spectrum and AT&T. The Project Site is located in an area with existing telecommunication facilities. Transmission towers are located on both the west and eastern side of the Project Site. The Proposed Project will not affect the towers and the towers will not affect the Proposed Project. The Proposed Project will have a less than significant impact on telecommunication facilities in the region.

The Proposed Project will not require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities. Impacts on public utilities will be less than significant.

b. Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiply dry years? Less than Significant Impact.

Water services in the City of Rialto is provided by three separate water agencies: the City of Rialto municipal water system (Veolia, through Rialto Water Services), the West Valley Water District (WVWD), and the Fontana Union Water Company (FUWC). The Proposed Project will obtain water for construction and operation from the WVWD, which serves southwestern San Bernardino County and a small portion of northern Riverside County, including the majority of the Agua Mansa Industrial Corridor.

The WVWD service area is approximately 31 square miles, including portions of the Cities of Rialto, Fontana, Colton, and Jurupa Valley, as well as unincorporated areas of San Bernardino County (Water Systems Consulting, Inc., 2016). Most of the WVWD's water supply comes from local sources, only 14% of the water supply is purchased from the State Water Project through San Bernardino Valley Municipal Water District. The majority (51%) of WVWD's water supply is obtained from groundwater wells within the District located in five local basins: Chino Basin, Bunker Hill Basin, Lytle Creek Basin, North Riverside Basin, and Rialto-Colton Basin. An additional 17% of the WVWD's water supply is purchased from San Bernardino Valley Municipal Water District through the Base Line Feeder Project, which is also obtained locally from wells in the Bunker Hill Basin. 18% of the WVWD water supply is obtained from surface water sourced locally from Lytle Creek in the San Bernardino Mountains which is then treated at the 14.4-mgd Oliver P. Roemer Water Filtration Facility.

Construction of the Proposed Project is expected to use a maximum of 20,000 gallons of water per day. Once operational, total water usage for the Proposed project is expected to be approximately 9 acre-feet per year. The 2015 San Bernardino Valley Regional Urban Water Management Plan (UWMP) was published in June 2016, which includes WVWD and nine other water suppliers in the region. The UWMP projected water demands for various use types in five-year increments for 2020 through 2040. Demand for raw and potable water for industrial uses in 2025 is projected to be 2,008-acre feet of water per year (afy). Total demand for raw and potable water is projected to be 22,256 afy. Therefore, industrial uses represent approximately 9.0% of total water demand. The projected water use for industrial uses through 2040 in five-year increments are as follows: year 2030 – (8.7%), year 2035 - (8.4%), year 2040 – (8.2%).

Additionally, the UWMP performed a supply and demand assessment for WVWD. The following tables summarize the results for a normal year (Table UTL-1), single dry year (Table UTL-2), and multiple dry years (Table UTL-3):

Table UTL-1: WVWD Supply and Demand Comparison (Normal Year)

Totals	2025	2030	2035	2040
Supply	41,900	45,400	48,400	48,400
Demand	22,256	23,802	25,492	27,312
Difference	19,644	21,598	22,908	21,088

Notes:
1. Projections for 2020 have been excluded.
2. All units are in acre-feet per year
Source: Table 11-19 from 2015 San Bernardino Valley Regional Urban Water Management Plan

Table UTL-2: WVWD Supply and Demand Comparison (Single Dry Year)

Totals	2025	2030	2035	2040
Supply	38,530	42,030	45,030	45,030
Demand	24,481	26,183	28,041	30,043
Difference	14,049	15,847	16,989	14,987

Notes:
1. Projections for 2020 have been excluded.
2. All units are in acre-feet per year
Source: Table 11-20 from 2015 San Bernardino Valley Regional Urban Water Management Plan

Table UTL-3: WVWD Supply and Demand Comparison (Multiple Dry Years)

	Totals	2025	2030	2035	2040
First Year	Supply	38,530	42,030	45,030	45,030
	Demand	24,481	26,183	28,041	30,043
	Difference	14,049	15,847	16,989	14,987
Second Year	Supply	38,530	42,030	45,030	45,030
	Demand	22,256	23,802	25,492	27,312
	Difference	16,274	18,228	19,538	17,718
Third Year	Supply	38,530	42,030	45,030	45,030
	Demand	20,030	21,422	22,943	24,580
	Difference	18,500	20,608	22,087	20,450

Notes:
1. Projections for 2020 have been excluded.
2. All units are in acre-feet per year
Source: Table 11-21 from 2015 San Bernardino Valley Regional Urban Water Management Plan

The analysis clearly demonstrates that the WVWD has sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years. The Proposed Project's anticipated water usage of 9 afy will not exceed the supply available from WVWD. Therefore, the Proposed Project will have a less than significant impact on the availability of water supply.

c. Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments? **Less than Significant Impact.**

The wastewater treatment infrastructure and services needed to serve the Proposed Project's demand is already available. WVWD has the capacity to serve the Proposed Project's demand in addition to existing commitments. Therefore, the Proposed Project will have a less than significant impact.

d. Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals? **Less than Significant Impact.**

The City of Rialto's Waste Management Office contracts with Burrtec Waste Industries for trash and recycling services. Solid waste generated by the Proposed Project during construction and operation would be disposed of at the Mid-Valley Sanitary Landfill, located at 2390 N. Alder Avenue, Rialto, CA, approximately 7.5 miles northwest of the Project Site. The Mid-Valley Landfill encompasses 498 acres and has a disposal acreage of 408 acres. The landfill has a maximum permitted throughput of 7,500 tons per day and a maximum permitted capacity of 101.3 million cubic yards. As of June 30th, 2019, the landfill had a remaining capacity of 61.2 million cubic yards. The landfill is estimated to cease operations in April 2045 (CalRecycle, 2020).

Under the Integrated Waste Management Act if 1989, local jurisdictions are required to calculate an annual per capita disposal rate that reflects the measurement of the amount of waste disposed in pounds into the landfill by each person per day. A jurisdiction is defined as "a city, county, combined city and county, or a regional agency with the responsibility for meeting Integrated Waste Management Act requirements." The City of Rialto is classified as a jurisdiction and in 2018 had an annual per capita disposal rate per employee of 12.1 pounds. Based on this rate, operation of the Proposed Project would generate approximately 1,815 lbs of solid waste per day, or 331.5 tons per year (default generation rate for 150 employees). This reflects an increase of 0.01% of Mid-Valley Landfill's daily permitted capacity. This increase imperceptible increase will not cause the landfill to exceed its permitted throughput and will not impair the attainment of solid waste reduction goals. Therefore, the Proposed Project will have a less than significant impact with regards to solid waste generation.

e. Comply with federal, state, and local statutes and regulation related to solid waste? **Less than Significant Impact.**

All solid waste generated from the Proposed Project will be disposed of at the Mid-Valley Landfill. The Mid-Valley Landfill complies with all federal, state, and local statutes and regulations related to solid waste. Therefore, the Proposed Project will be in compliance with applicable statutes and regulations related to solid waste and impacts will be less than significant.

4.19.2 Cumulative Impacts

The Proposed Project would have a cumulatively less than significant impact with regards to utilities and service systems. The existing local utilities and service systems are sufficient to meet all the demands of the Proposed Project, including water and wastewater infrastructure, as well as solid waste disposal. Utilities infrastructure in the region has been designed to accommodate future development and infrastructure growth in the area, such as that of the Proposed Project. Demand for raw and potable from WVWD will only increase nominally as a result of the Proposed Project, which will be less than significant on the total available supply of water within the district.

Furthermore, the Proposed Project would nominally increase solid waste disposal at the Mid-Valley Landfill which would not be cumulatively considerable. Prior analysis and planning have been performed to ensure developments such as the Proposed Project have access to adequate resources and infrastructure in the area. The Proposed Project, along with past, present, and reasonably foreseeable projects will not generate significant cumulative impacts with regards to utilities and service systems in the area.

4.20 WILDFIRE

Checklist Item	Potentially Significant Impact	Less Than Significant After Mitigation	Less than Significant Impact	No Impact
If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project…				
a. Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐
b. Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	☐	☐	☐	☒
c. Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines, or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	☐	☐	☐	☒
d. Expose people or structure to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	☐	☒

4.20.1 Discussion

a. If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project substantially impair an adopted emergency response plan or emergency evacuation plan? **Less than Significant Impact.**

According to Cal Fire's Fire Hazard Severity Zone (FHSZ) Viewer, the Project Site is not located within any FHSZ (Cal Fire, 2020). The closest High FHSZ is La Loma Hills, which is located approximately 1 mile east of the Project Site, but it is located on the opposite side of Agua Mansa Road and the Santa Ana River. As discussed in section 4.15.1, the Project Site is located in a very highly connected area for fire protection. In the event of a wildfire, project-adjacent roadways would serve as emergency evacuation routes. The Proposed Project will not alter existing roadways in a manner that may impair adopted emergency response plans or any existing emergency evacuation plans. As discussed in section 4.17, increased transportation traffic generated from construction and operation of the Proposed Project will not have discernable impacts on emergency response or evacuations. Therefore, the Proposed Project will have less-than-significant impacts on all applicable emergency response plans and emergency evacuation plans.

b. If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire? No Impact.

As stated in part a., the Proposed Project is not located in or near state responsibility areas or lands classified as very high fire hazard severity zones. Furthermore, the entire Project Site will be regraded to level out the entire surface then repaved which will reduce the risk of wildfire. The residential structure located east of the project boundary is downslope from the Project Site, which puts the structure at a lower risk. Structures at the Proposed Project will be constructed using materials with sufficiently low ignitability to avoid exacerbating wildfire risks. The Project Site is susceptible to occasional wind gusts reaching 25 mph, with average maximum wind speeds of around 15 mph during summer months with high wildfire risks (Weather Underground, 2020). Prevailing wind direction in the area of the Project Site blows from the West-Southwest. The Proposed Project will have no impact on exacerbating wildfire risks that would expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire.

c. If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines, or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment? No Impact.

As stated in part a., the Proposed Project is not located in or near state responsibility areas or lands classified as very high fire hazard severity zones. SCE powerlines exist above the Project Site, but the Proposed Project does not require the installation or maintenance of additional infrastructure that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment. Therefore, the Proposed Project will have no impacts with regards to exacerbating fire risks related to infrastructure.

d. If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project expose people or structure to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes? No Impact.

As stated in part a., the Proposed Project is not located in or near state responsibility areas or lands classified as very high fire hazard severity zones. In addition, the Project Site will be regraded and repaved during construction. The entire Project Site will be paved with interlocking, pervious concrete pavers except for structure footprints and an approximately 45,000 square-foot dirt area in the northeast corner of the Project Site. Agua Mansa Road is located downslope from the Project Site. The paved surface will reduce the likelihood of significant risks such as downstream flooding or landslides associated with runoff, post-fire instability, and drainage changes. Therefore, the Proposed Project will have no impacts on exposure associated with these risks.

4.20.2 Cumulative Impacts

The Proposed Project is not located in or near state responsibility areas or lands classified as very high fire hazard severity zones and would have no cumulative impact with regards to wildfire. The Proposed Project is located in an area zoned for industrial uses and is not in the vicinity of high fire hazard zones. The majority of the Proposed Project will be paved, which will not exacerbate wildfire risks. The Proposed Project, in conjunction with past, present, and reasonably foreseeable future projects, will not have a cumulative impact with regards to wildfire.

4.21 MANDATORY FINDINGS OF SIGNIFICANCE

Checklist Item	Potentially Significant Impact	Less Than Significant After Mitigation	Less than Significant Impact	No Impact
a. Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of endangered plant or animal or eliminate important examples of major periods of California history or prehistory?	☐	☒	☐	☐
b. Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effect of probably future projects.)	☐	☐	☒	☐
c. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☒	☐

4.21.1 Discussion

a. Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of endangered plant or animal or eliminate important examples of major periods of California history or prehistory? **Less than Significant After Mitigation.**

   Based on the discussion in the previous chapters, impacts to the environment as a result of the Proposed Project will be less than significant after mitigation. The Proposed Project is an industrial facility located within an area designated for industrial uses. Therefore, impacts will be less than significant.

b. Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effect of probably future projects.) **Less than Significant Impact.**

The Proposed Project does not have impacts that are cumulatively considerable. The Proposed Project fits within the plans and regulations established for the area. Cumulative impacts for each resource area are discussed in the chapters above, and each were determined to have less-than-significant cumulative impacts.

c. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly? Less than Significant Impact.

   The Proposed Project will not cause substantial adverse effects on human beings, either directly or indirectly. Impacts from the Proposed Project will be less than significant after mitigation, and the Proposed Project is a typical industrial facility located in an area zoned for industrial use. Therefore, the impacts will be less than significant.

5.0 REFERENCES

1. Association of Environmental Professionals (AEP), 2019. 2019 California Environmental Quality Act (CEQA) Statute & Guidelines.

2. California Department of Conservation, 2019a. Farmland mapping & Monitoring Program. https://www.conservation.ca.gov/dlrp/fmmp.

3. California Department of Conservation, 2019b. Alquist-Priolo Earthquake Fault Zones. https://www.conservation.ca.gov/cgs/alquist-priolo.

4. California Department of Conservation, 2019c. Earthquake Zones of Required Investigation. https://maps.conservation.ca.gov/cgs/EQZApp/app/.

5. California Department of Conservation, 2019d. Well Finder, *CalGEM GIS*. https://www.conservation.ca.gov/calgem/Pages/WellFinder.aspx.

6. California Department of Forestry and Fire Protection (Cal Fire), 2020. FHSZ Viewer. https://egis.fire.ca.gov/fhsz/.

7. California Department of Resources Recycling and Recovery (CalRecycle), 2019. SWIS Facility Detail. https://www2.calrecycle.ca.gov/swfacilities/Directory/36-AA-0055.

8. California Department of Transportation (Caltrans), 2020. Scenic Highways. https://dot.ca.gov/programs/design/lap-landscape-architecture-and-community-livability/lap-liv-i-scenic-highways.

9. California Legislative Information. Public Resources Code. https://leginfo.legislature.ca.gov/faces/codes_displayText.xhtml?division=2.&chapter=7.5.&lawCode=PRC.

10. California Water News Daily, 2017. California Energy Commission grant funds new wastewater treatment technology in Rialto. http://californiawaternewsdaily.com/infrastructure/california-energy-commission-grant-funds-new-wastewater-treatment-technology-in-rialto/. October 3.

11. City of Rialto, 2019. Municipal Code. https://www.yourrialto.com/city-hall/departments/city-clerk/municipal-code/.

12. City of Rialto, 2019. Utilities. https://www.yourrialto.com/residents/utilities/.

13. Department of Toxic Substances Control (DTSC), 2020. Site Mitigation & Restoration Program, *DTSC's Hazardous Waste and Substances Site List – Site Cleanup (Cortese List)*. https://dtsc.ca.gov/dtscs-cortese-list/.

14. Rialto Water Services (RWS), 2020. About Us. https://rialtowater.com/about-us/.

15. San Bernardino County Fire, 2020. San Bernardino County Fire & Rescue Station Map. https://www.sbcfire.org/FireStations.aspx.

16. San Bernardino County, 2016. Geologic Hazard Maps. http://cms.sbcounty.gov/lus/planning/zoningoverlaymaps/geologichazardmaps.aspx.

17. United States Census Bureau. QuickFacts. https://www.census.gov/quickfacts/fact/table/rialtocitycalifornia/PST045219.

18. United States Environmental Protection Agency (USEPA), 2010. Spill Prevention, Control, and Countermeasure (SPCC) Regulation, *A Facility Owner/Operator's Guide to Oil Pollution Prevention*. June.

19. University of Pittsburgh, 2020. Hazardous Materials. https://www.emergency.pitt.edu/potential-hazards/hazardous-materials. March 19.

20. Water Systems Consulting Inc., 2016. 2015 San Bernardino Valley Regional Urban Water Management Plan. June.

21. Weather Underground, 2020. San Bernardino, CA Weather History. https://www.wunderground.com/history/monthly/us/ca/san-bernardino/KSBD/date/2018-9.

Figures

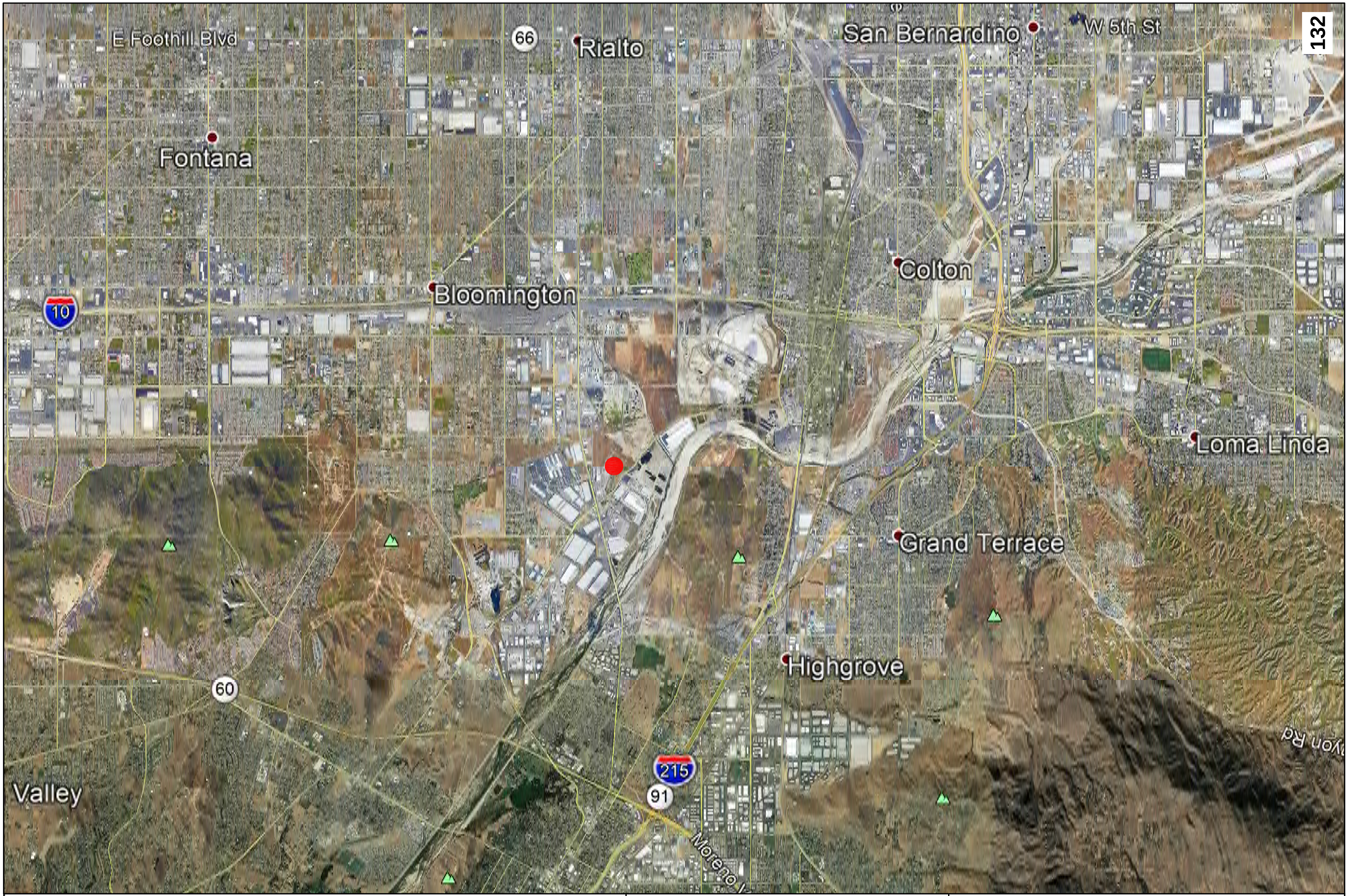


FIGURE 1. SITE VICINITY MAP

Legend

Site Location

N

Prepared For:

CEQA Initial Study
Angelus Block Co Inc. - Rialto Block Plant
3435 S Riverside Avenue
Rialto, CA 91316
AGLS-20-9598

NV5
ALTA ENVIRONMENTAL

NV5
3777 Long Beach Blvd, Annex Bldg
Long Beach, CA 90807
562.495.5777

FIGURE 2. Project Site Boundary

Legend

— Site Boundary

N

Prepared For:

CEQA Initial Study
Angelus Block Co Inc. - Rialto Block Plant
3435 S Riverside Avenue
Rialto, CA 91316

AGLS-20-9598

NV5
3777 Long Beach Blvd, Annex Bldg
Long Beach, CA 90807
562.495.5777

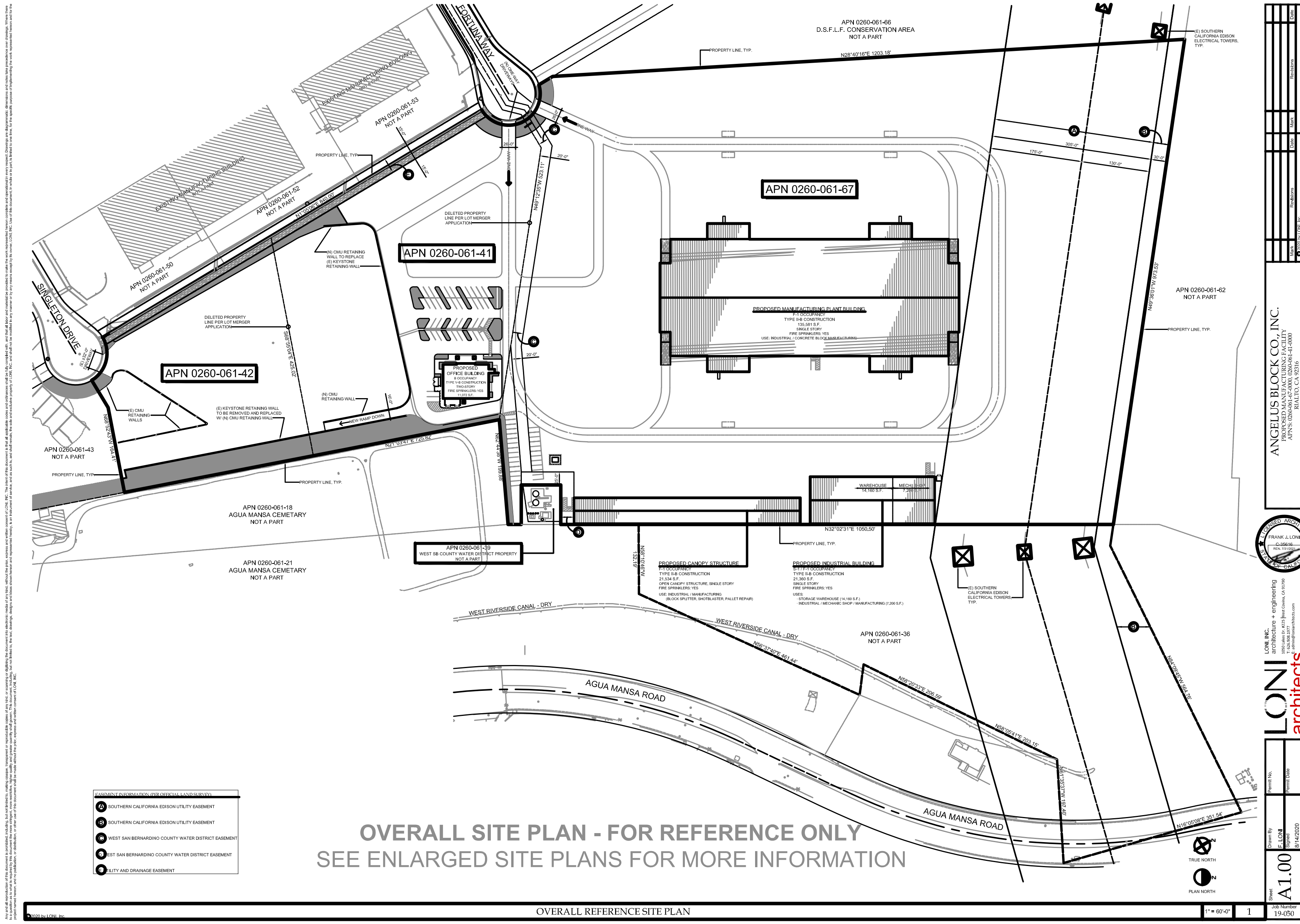


FIGURE 3. Proposed Project Site Layout

Legend

None, see figure.

N ➤

Prepared For:

CEQA Initial Study

Angelus Block Co Inc. - Rialto Block Plant

3435 S Riverside Avenue

Rialto, CA 91316

AGLS-20-9598

NV5 ALTA ENVIRONMENTAL

NV5

3777 Long Beach Blvd, Annex Bldg

Long Beach, CA 90807

562.495.5777

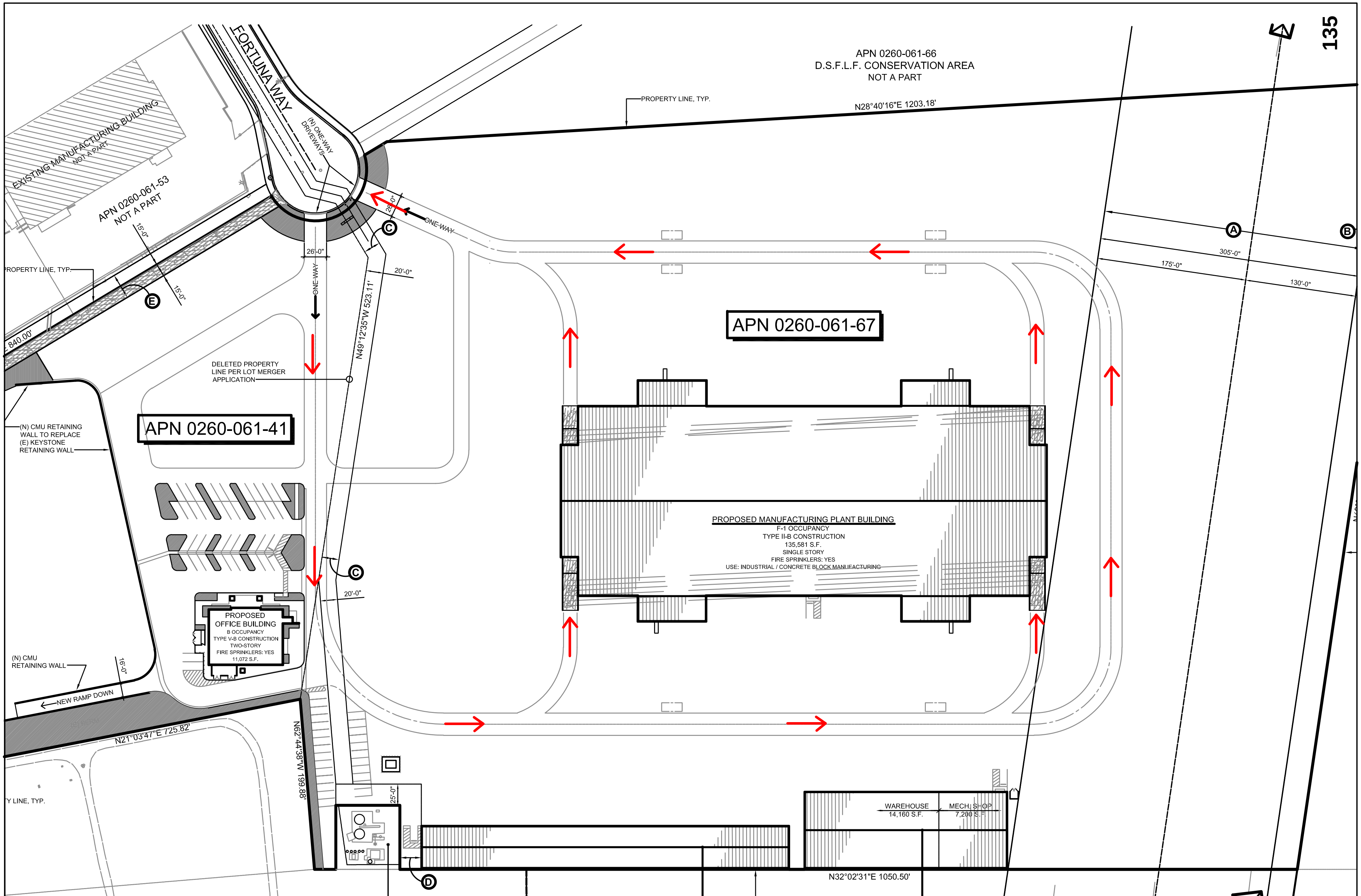


FIGURE 4. Designated Truck Routes

Legend

Truck Routes

N

Prepared For:

CEQA Initial Study
Angelus Block Co Inc. - Rialto Block Plant
3435 S Riverside Avenue
Rialto, CA 91316

AGLS-20-9598

NV5
ALTA ENVIRONMENTAL

NV5
3777 Long Beach Blvd, Annex Bldg
Long Beach, CA 90807
562.495.5777

Appendix A

U.S. Fish and Wildlife Service Permit and Habitat Conservation Plan

DEPARTMENT OF THE INTERIOR
U.S. FISH AND WILDLIFE SERVICE

3-201
(1/97)

FEDERAL FISH AND WILDLIFE PERMIT

1. PERMITTEE

ANTONINI TRUST
11374 TUXFORD STREET
SUN VALLEY, LOS ANGELES COUNTY, CA 91352

2. AUTHORITY-STATUTES
16 USC 1539(A)

REGULATIONS *(Attached)*
50 CFR 17.22
50 CFR 13

3. NUMBER
TE015986-0

4. RENEWABLE
[X] YES
[ ] NO

5. MAY COPY
[X] YES
[ ] NO

6. EFFECTIVE
8/27/FF1

7. EXPIRES
8/27/2029

8. NAME AND TITLE OF PRINCIPAL OFFICER *(If #1 is a business)*
MARIO E. ANTONINI
TRUSTEE

9. TYPE OF PERMIT
ENDANGERED SPECIES

10. LOCATION WHERE AUTHORIZED ACTIVITY MAY BE CONDUCTED
City of Rialto, County of San Bernardino, California, on lands described in the Habitt Conservation Plan prepared for the Edward Antonini Residuary Trust, Angelus Block company, Inc., and E-Z Mix, Inc.

11. CONDITIONS AND AUTHORIZATIONS:

A. GENERAL CONDITIONS SET OUT IN SUBPART D OF 50 CFR 13, AND SPECIFIC CONDITIONS CONTAINED IN FEDERAL REGULATIONS CITED IN BLOCK #2 ABOVE, ARE HEREBY MADE A PART OF THIS PERMIT. ALL ACTIVITIES AUTHORIZED HEREIN MUST BE CARRIED OUT IN ACCORD WITH AND FOR THE PURPOSES DESCRIBED IN THE APPLICATION SUBMITTED. CONTINUED VALIDITY, OR RENEWAL, OF THIS PERMIT IS SUBJECT TO COMPLETE AND TIMELY COMPLIANCE WITH ALL APPLICABLE CONDITIONS, INCLUDING THE FILING OF ALL REQUIRED INFORMATION AND REPORTS.

B. THE VALIDITY OF THIS PERMIT IS ALSO CONDITIONED UPON STRICT OBSERVANCE OF ALL APPLICABLE FOREIGN, STATE, LOCAL OR OTHER FEDERAL LAW.

C. VALID FOR USE BY PERMITTEE NAMED ABOVE.

D. Further conditions of authorization are contained in the attached Special Terms and Conditions.

[X] ADDITIONAL CONDITIONS AND AUTHORIZATIONS ALSO APPLY

12. REPORTING REQUIREMENTS

ISSUED BY
Elizabeth H. Stevens

TITLE
Elizabeth H. Stevens
DEPUTY MANAGER, CA/NV OPERATIONS OFFICE

DATE
8/27/FF1

E. All sections of Title 50 *Code of Federal Regulations*, §§ 13, 17.22, and 17.32 are conditions of this permit (Attachment 1).

F. The authorization granted by this permit is subject to compliance with, and implementation of, the final Habitat Conservation Plan (HCP), and the executed Implementation Agreement (IA), for Angelus Block Company, Inc., E-Z Mix, Inc., and the Edward Antonini Residuary Trust, in connection with development of approximately 65 acres in the City of Rialto, San Bernardino County, California. The HCP and IA are hereby incorporated into the permit.

G. Except as conditioned below, the permittees and their designated agents are authorized under the Federal Endangered Species Act of 1973, as amended (Act), to incidentally take (harass; or harm through habitat loss, including injury or kill) the Delhi Sands flower-loving fly (*Rhaphiomidas terminatus abdominalis*), listed as endangered under the Act, to the extent that take of this species would otherwise be prohibited under section 9 of the Act and its implementing regulations, or pursuant to a rule promulgated under section 4(d) of the Act. Take must be incidental to the construction and operation of the Industrial Project on the 65-acre Development Area, and management of the approximately 30.5 acre Conservation Area, as described in the HCP, and as conditioned herein. Pesticide and herbicide use is not covered by this permit.

Conditions

(i) This permit is not effective until authorized individuals from Angelus Block Company, Inc., E-Z Mix, Inc., and the Edward Antonini Residuary Trust have signed the IA.

(ii) Prior to any ground disturbance on lots 1-3, Antonini Trust shall provide evidence to the Service of recordation of deed restrictions for the Conservation Area.

(iii) Prior to any ground disturbance on lot 1-3, Antonini Trust shall provide the Service with proof of the purchase of the United States Treasury Bond. Antonini Trust shall transfer the Endowment to a Conservation Organization, pursuant to the terms of the IA. Permittees agree that the Endowment may need to be replaced by an alternative funding mechanism, the cost of which shall not exceed $195,251, if necessary to select an acceptable Conservation Organization.

(iv) The Conservation Bank Credits will be available for purchase after the permittees have completed the initial trash and weed removal throughout the Conservation Area (required within 6 months of permit issuance), where appropriate, in coordination with the Service.

(v) Prior to the commencement of construction activities, the Applicants shall notify the Service that fencing and signing, and the education program have been successfully implemented.

H. Upon finding dead, injured, or sick endangered or threatened wildlife species, the permittees or their designated agents must notify orally within 1 working day the Service's Carlsbad Fish and Wildlife Office, 2730 Loker Avenue West, Carlsbad, California 92008, telephone (760) 431-9440. Written notification to the Carlsbad Fish and Wildlife Office must be made within 3 working days and must include the date, time, and location of the specimen and any other pertinent information. Dead animals may be marked in an appropriate manner, photographed, and left on site. Should any sick or injured animals survive, the Service should be contacted regarding final disposition of the animals. In the event that a species has been taken in contravention of any Federal, State, or local law, all relevant information shall be reported within 24 hours to the Carlsbad Fish and Wildlife Office or to the Service's Division of Law Enforcement in San Diego, (619) 557-5063.

I. Annual reports shall be prepared as described in the HCP, due by December 31 of each year, beginning in 2000 and continuing until at least 2004. At the end of the 5th year, the conservation organization shall submit a status report to the Service. If the performance criteria have not been met as established in the enhancement/restoration plan prepared by the land manager for the Conservation Area and approved by the Service's Carlsbad Fish and Wildlife Office, maintenance or re-seeding shall be prescribed and monitoring will be extended until performance criteria are met. Upon completion of the 5-year maintenance and monitoring period, the conservation organization shall implement a long-term maintenance program that will include its own reporting schedule.

One copy of the annual report, and any subsequent reporting, shall be submitted to the Field Supervisor of the Carlsbad Fish and Wildlife Office, and one copy shall be submitted to the Assistant Regional Director, Ecological Services, Fish and Wildlife Service, 911 N.E. 11th Avenue, Portland, Oregon 97232.

J. A copy of this permit must be in the possession of the permittees and designated agents while conducting taking activities. Please refer to the permit number in all correspondence concerning permit activities. Any questions you may have about this permit should be directed to the Field Supervisor, Carlsbad Fish and Wildlife Office.

Attachment

[39 FR 1161, Jan. 4, 1974, as amended at 42 FR 10465, Feb. 22, 1977; 42 FR 32377, June 24, 1977; 44 FR 54006, Sept. 17, 1979; 44 FR 59083, Oct. 12, 1979; 45 FR 56673, Aug. 25, 1980; 45 FR 78154, Nov. 25, 1980; 46 FR 42680, Aug. 24, 1981; 48 FR 31607, July 8, 1983; 48 FR 57300, Dec. 29, 1983; 50 FR 39687, Sept. 30, 1985; 50 FR 45408, Oct. 31, 1985; 54 FR 38147, Sept. 14, 1989]

Subpart C—Permit Administration

§ 13.21 Issuance of permits.

(a) No permit may be issued prior to the receipt of a written application therefor, unless a written variation from the requirements, as authorized by § 13.4, is inserted into the official file of the Bureau. An oral or written representation of an employee or agent of the United States Government, or an action of such employee or agent, shall not be construed as a permit unless it meets the requirements of a permit as defined in 50 CFR 10.12.

(b) Upon receipt of a properly executed application for a permit, the Director shall issue the appropriate permit unless:

(1) The applicant has been assessed a civil penalty or convicted of any criminal provision of any statute or regulation relating to the activity for which the application is filed, if such assessment or conviction evidences a lack of responsibility.

(2) The applicant has failed to disclose material information required, or has made false statements as to any material fact, in connection with his application;

(3) The applicant has failed to demonstrate a valid justification for the permit and a showing of responsibility;

(4) The authorization requested potentially threatens a wildlife or plant population, or

(5) The Director finds through further inquiry or investigation, or otherwise, that the applicant is not qualified.

(c) *Disqualifying factors.* Any one of the following will disqualify a person from receiving permits issued under this part.

(1) A conviction, or entry of a plea of guilty or nolo contendere, for a felony violation of the Lacey Act, the Migratory Bird Treaty Act, or the Bald and Golden Eagle Protection Act disqualifies any such person from receiving or exercising the privileges of a permit, unless such disqualification has been expressly waived by the Director in response to a written petition.

(2) The revocation of a permit for reasons found in § 13.28 (a)(1) or (a)(2) disqualifies any such person from receiving or exercising the privileges of a similar permit for a period of five years from the date of the final agency decision on such revocation.

(3) The failure to pay any required fees or assessed costs and penalties, whether or not reduced to judgement disqualifies such person from receiving or exercising the privileges of a permit as long as such moneys are owed to the United States. This requirement shall not apply to any civil penalty presently subject to administrative or judicial appeal; provided that the pendency of a collection action brought by the United States or its assignees shall not constitute an appeal within the meaning of this subsection.

(4) The failure to submit timely, accurate, or valid reports as required may disqualify such person from receiving or exercising the privileges of a permit as long as the deficiency exists.

(d) *Use of supplemental information.* The issuing officer, in making a determination under this subsection, may use any information available that is relevant to the issue. This may include any prior conviction, or entry of a plea of guilty or nolo contendere, or assessment of civil or criminal penalty for a violation of any Federal or State law or regulation governing the permitted activity. It may also include any prior permit revocations or suspensions, or any reports of State or local officials. The issuing officer shall consider all relevant facts or information available, and may make independent inquiry or investigation to verify information or substantiate qualifications asserted by the applicant.

(e) *Conditions of issuance and acceptance.* (1) Any permit automatically incorporates within its terms the conditions and requirements of subpart D of this part and of any part(s) or section(s) specifically authorizing or governing the activity for which the permit is issued.

(2) Any person accepting and holding a permit under this subchapter B acknowledges the necessity for close regulation and monitoring of the permitted activity by the Government. By accepting such permit, the permittee consents to and shall allow entry by agents or employees of the Service upon premises where the permitted activity is conducted at any reasonable hour. Service agents or employees may enter such premises to inspect the location; any books, records, or permits required to be kept by this subchapter B; and any wildlife or plants kept under authority of the permit.

(f) *Term of permit.* Unless otherwise modified, a permit is valid during the period specified on the face of the permit. Such period shall include the effective date and the date of expiration.

(g) *Denial.* The issuing officer may deny a permit to any applicant who fails to meet the issuance criteria set forth in this section or in the part(s) or section(s) specifically governing the activity for which the permit is requested.

[39 FR 1161, Jan. 4, 1974, as amended at 42 FR 32377, June 24, 1977; 47 FR 30785, July 15, 1982; 54 FR 38148, Sept. 14, 1989]

§ 13.22 Renewal of permits.

(a) *Application for renewal.* Applicants for renewal of a permit must submit a written application at least 30 days prior to the expiration date of the permit. Applicants must certify in the form required by § 13.12(a)(5) that all statements and information in the original application remain current and correct, unless previously changed or corrected. If such information is no longer current or correct, the applicant must provide corrected information.

(b) *Renewal criteria.* The Service shall issue a renewal of a permit if the applicant meets the criteria for issuance in § 13.21(b) and is not disqualified under § 13.21(c).

(c) *Continuation of permitted activity.* Any person holding a valid, renewable permit, who has complied with this section, may continue the activities authorized by the expired permit until the Service has acted on such person's application for renewal.

(d) *Denial.* The issuing officer may deny renewal of a permit to any applicant who fails to meet the issuance criteria set forth in § 13.21 of this part, or in the part(s) or section(s) specifically governing the activity for which the renewal is requested.

[54 FR 38148, Sept. 14, 1989]

§ 13.23 Amendment of permits.

(a) *Permittee's request.* Where circumstances have changed so that a permittee desires to have any condition of his permit modified, such permittee must submit a full written justification and supporting information in conformity with this part and the part under which the permit was issued.

(b) *Service reservation.* The Service reserves the right to amend any permit for just cause at any time during its term, upon written finding of necessity.

(c) *Change of name or address.* A permittee is not required to obtain a new permit if there is a change in the legal individual or business name, or in the mailing address of the permittee. A permittee is required to notify the issuing office within 10 calendar days of such change. This provision does not authorize any change in location of the conduct of the permitted activity when approval of the location is a qualifying condition of the permit.

[54 FR 38148, Sept. 14, 1989]

§ 13.24 Right of succession by certain persons.

(a) Certain persons, other than the permittee are granted the right to carry on a permitted activity for the remainder of the term of a current permit provided they comply with the provisions of paragraph (b) of this section. Such persons are the following:

(1) The surviving spouse, child, executor, administrator, or other legal representative of a deceased permittee; and

(2) A receiver or trustee in bankruptcy or a court designated assignee for the benefit of creditors.

(b) In order to secure the right provided in this section the person or persons desiring to continue the activity shall furnish the permit to the issuing officer for endorsement within 90 days

from the date the successor begins to carry on the activity.

[54 FR 38149, Sept. 14, 1989]

§ 13.25 Permits not transferable; agents.

(a) Permits issued under this part are not transferable or assignable. Some permits authorize certain activities in connection with a business or commercial enterprise and in the event of any lease, sale, or transfer of such business entity, the successor must obtain a permit prior to continuing the permitted activity. However, certain limited rights of succession are provided in § 13.24.

(b) Except as otherwise stated on the face of the permit, any person who is under the direct control of the permittee, or who is employed by or under contract to the permittee for purposes authorized by the permit, may carry out the activity authorized by the permit, as an agent for the permittee.

[54 FR 38149, Sept. 14, 1989]

§ 13.26 Discontinuance of permit activity.

When a permittee, or any successor to a permittee as provided for by § 13.24, discontinues activities authorized by a permit, the permittee shall within 30 calendar days of the discontinuance return the permit to the issuing office together with a written statement surrendering the permit for cancellation. The permit shall be deemed void and cancelled upon its receipt by the issuing office. No refund of any fees paid for issuance of the permit or for any other fees or costs associated with a permitted activity shall be made when a permit is surrendered for cancellation for any reason prior to the expiration date stated on the face of the permit.

[54 FR 38149, Sept. 14, 1989]

§ 13.27 Permit suspension.

(a) *Criteria for suspension.* The privileges of exercising some or all of the permit authority may be suspended at any time if the permittee is not in compliance with the conditions of the permit, or with any applicable laws or regulations governing the conduct of the permitted activity. The issuing officer may also suspend all or part of the privileges authorized by a permit if the permittee fails to pay any fees, penalties or costs owed to the Government. Such suspension shall remain in effect until the issuing officer determines that the permittee has corrected the deficiencies.

(b) *Procedure for suspension.* (1) When the issuing officer believes there are valid grounds for suspending a permit the permittee shall be notified in writing of the proposed suspension by certified or registered mail. This notice shall identify the permit to be suspended, the reason(s) for such suspension, the actions necessary to correct the deficiencies, and inform the permittee of the right to object to the proposed suspension. The issuing officer may amend any notice of suspension at any time.

(2) Upon receipt of a notice of proposed suspension the permittee may file a written objection to the proposed action. Such objection must be in writing, must be filed within 45 calendar days of the date of the notice of proposal, must state the reasons why the permittee objects to the proposed suspension, and may include supporting documentation.

(3) A decision on the suspension shall be made within 45 days after the end of the objection period. The issuing officer shall notify the permittee in writing of the Service's decision and the reasons therefore. The issuing officer shall also provide the applicant with the information concerning the right to request reconsideration of the decision under § 13.29 of this part and the procedures for requesting reconsideration.

[54 FR 38149, Sept. 14, 1989]

§ 13.28 Permit revocation.

(a) *Criteria for revocation.* A permit may be revoked for any of the following reasons:

(1) The permittee willfully violates any Federal or State statute or regulation, or any Indian tribal law or regulation, or any law or regulation of any foreign country, which involves a violation of the conditions of the permit or of the laws or regulations governing the permitted activity; or

(2) The permittee fails within 60 days to correct deficiencies that were the cause of a permit suspension; or

(3) The permittee becomes disqualified under § 13.21(c) of this part; or

(4) A change occurs in the statute or regulation authorizing the permit that prohibits the continuation of a permit issued by the Service; or

(5) The population(s) of the wildlife or plant that is subject of the permit declines to the extent that continuation of the permitted activity would be detrimental to maintenance or recovery of the affected population.

(b) *Procedure for revocation.* (1) When the issuing officer believes there are valid grounds for revoking a permit, the permittee shall be notified in writing of the proposed revocation by certified or registered mail. This notice shall identify the permit to be revoked, the reason(s) for such revocation, the proposed disposition of the wildlife, if any, and inform the permittee of the right to object to the proposed revocation. The issuing officer may amend any notice of revocation at any time.

(2) Upon receipt of a notice of proposed revocation the permittee may file a written objection to the proposed action. Such objection must be in writing, must be filed within 45 calendar days of the date of the notice of proposal, must state the reasons why the permittee objects to the proposed revocation, and may include supporting documentation.

(3) A decision on the revocation shall be made within 45 days after the end of the objection period. The issuing officer shall notify the permittee in writing of the Service's decision and the reasons therefore, together with the information concerning the right to request and the procedures for requesting reconsideration.

(4) Unless a permittee files a timely request for reconsideration, any wildlife held under authority of a permit that is revoked must be disposed of in accordance with instructions of the issuing officer. If a permittee files a timely request for reconsideration of a proposed revocation, such permittee may retain possession of any wildlife held under authority of the permit until final disposition of the appeal process.

[54 FR 38149, Sept. 14, 1989]

§ 13.29 Review procedures.

(a) *Request for reconsideration.* Any person may request reconsideration of an action under this part if that person is one of the following:

(1) An applicant for a permit who has received written notice of denial;

(2) An applicant for renewal who has received written notice that a renewal is denied;

(3) A permittee who has a permit amended, suspended, or revoked, except for those actions which are required by changes in statutes or regulations, or are emergency changes of limited applicability for which an expiration date is set within 90 days of the permit change; or

(4) A permittee who has a permit issued or renewed but has not been granted authority by the permit to perform all activities requested in the application, except when the activity requested is one for which there is no lawful authority to issue a permit.

(b) *Method of requesting reconsideration.* Any person requesting reconsideration of an action under this part must comply with the following criteria:

(1) Any request for reconsideration must be in writing, signed by the person requesting reconsideration or by the legal representative of that person, and must be submitted to the issuing officer.

(2) The request for reconsideration must be received by the issuing officer within 45 calendar days of the date of notification of the decision for which reconsideration is being requested.

(3) The request for reconsideration shall state the decision for which reconsideration is being requested and shall state the reason(s) for the reconsideration, including presenting any new information or facts pertinent to the issue(s) raised by the request for reconsideration.

(4) The request for reconsideration shall contain a certification in substantially the same form as that provided by § 13.12(a)(5). If a request for reconsideration does not contain such certification, but is otherwise timely

and appropriate, it shall be held and the person submitting the request shall be given written notice of the need to submit the certification within 15 calendar days. Failure to submit certification shall result in the request being rejected as insufficient in form and content.

(c) *Inquiry by the Service.* The Service may institute a separate inquiry into the matter under consideration.

(d) *Determination of grant or denial of a request for reconsideration.* The issuing officer shall notify the permittee of the Service's decision within 45 days of the receipt of the request for reconsideration. This notification shall be in writing, shall state the reasons for the decision, and shall contain a description of the evidence which was relied upon by the issuing officer. The notification shall also provide information concerning the right to appeal, the official to whom an appeal may be addressed, and the procedures for making an appeal.

(e) *Appeal.* A person who has received an adverse decision following submission of a request for reconsideration may submit a written appeal to the Regional Director for the region in which the issuing office is located, or to the Director for offices which report directly to the Director. An appeal must be submitted within 45 days of the date of the notification of the decision on the request for reconsideration. The appeal shall state the reason(s) and issue(s) upon which the appeal is based and may contain any additional evidence or arguments to support the appeal.

(f) *Decision on appeal.* (1) Before a decision is made concerning the appeal the appellant may present oral arguments before the Regional Director or the Director, as appropriate, if such official judges oral arguments are necessary to clarify issues raised in the written record.

(2) The Service shall notify the appellant in writing of its decision within 45 calendar days of receipt of the appeal, unless extended for good cause and the appellant notified of the extension.

(3) The decision of the Regional Director or the Director shall constitute the final administrative decision of the Department of the Interior.

[54 FR 38149, Sept. 14, 1989]

Subpart D—Conditions

§ 13.41 Humane conditions.

Any live wildlife possessed under a permit must be maintained under humane and healthful conditions.

[54 FR 38150, Sept. 14, 1989]

§ 13.42 Permits are specific.

The authorizations on the face of a permit which set forth specific times, dates, places, methods of taking, numbers and kinds of wildlife or plants, location of activity, authorize certain circumscribed transactions, or otherwise permit a specifically limited matter, are to be strictly construed and shall not be interpreted to permit similar or related matters outside the scope of strict construction.

[39 FR 1161, Jan. 4, 1974, as amended at 42 FR 32377, June 24, 1977]

§ 13.43 Alteration of permits.

Permits shall not be altered, erased, or mutilated, and any permit which has been altered, erased, or mutilated shall immediately become invalid. Unless specifically permitted on the face thereof, no permit shall be copied, nor shall any copy of a permit issued pursuant to this subchapter B be displayed, offered for inspection, or otherwise used for any official purpose for which the permit was issued.

§ 13.44 Display of permit.

Any permit issued under this part shall be displayed for inspection upon request to the Director or his agent, or to any other person relying upon its existence.

§ 13.45 Filing of reports.

Permittees may be required to file reports of the activities conducted under the permit. Any such reports shall be filed not later than March 31 for the preceding calendar year ending December 31, or any portion thereof, during which a permit was in force, unless the regulations of this subchapter B or the provisions of the permit set forth other reporting requirements.

§ 13.46 Maintenance of records.

From the date of issuance of the permit, the permittee shall maintain complete and accurate records of any taking, possession, transportation, sale, purchase, barter, exportation, or importation of plants obtained from the wild (excluding seeds) or wildlife pursuant to such permit. Such records shall be kept current and shall include names and addresses of persons with whom any plant obtained from the wild (excluding seeds) or wildlife has been purchased, sold, bartered, or otherwise transferred, and the date of such transaction, and such other information as may be required or appropriate. Such records shall be legibly written or reproducible in English and shall be maintained for five years from the date of expiration of the permit.

[39 FR 1161, Jan. 4, 1974, as amended at 42 FR 32377, June 24, 1977; 54 FR 38150, Sept. 14, 1989]

§ 13.47 Inspection requirement.

Any person holding a permit under this subchapter B shall allow the Director's agent to enter his premises at any reasonable hour to inspect any wildlife or plant held or to inspect, audit, or copy any permits, books, or records required to be kept by regulations of this subchapter B.

[39 FR 1161, Jan. 4, 1974, as amended at 42 FR 32377, June 24, 1977]

§ 13.48 Compliance with conditions of permit.

Any person holding a permit under subchapter B and any person acting under authority of such permit must comply with all conditions of the permit and with all appllicable laws and regulations governing the permitted activity.

[54 FR 38150, Sept. 14, 1989]

§ 13.49 Surrender of permit.

Any person holding a permit under subchapter B shall surrender such permit to the issuing officer upon notification that the permit has been suspended or revoked by the Service, and all appeal procedures have been exhausted.

[54 FR 38150, Sept. 14, 1989]

§ 13.50 Acceptance of liability.

Any person holding a permit under subchapter B assumes all liability and responsibility for the conduct of any activity conducted under the authority of such permit.

[54 FR 38150, Sept. 14, 1989]

PART 14—IMPORTATION, EXPORTATION, AND TRANSPORTATION OF WILDLIFE

270—52 FR 21480; June 5, 1987.
271—52 FR 21484; June 5, 1987.
274—52 FR 22589; June 12, 1987.
275—52 FR 22933; June 16, 1987.
276—52 FR 22936; June 16, 1987.
277—52 FR 22939; June 16, 1987.
285—52 FR 32929; September 1, 1987.
286—52 FR 34917; September 16, 1987.
291—52 FR 36270; September 28, 1987.
293—52 FR 37420; October 6, 1987.
295—52 FR 41440; October 28, 1987.
297—52 FR 42071; November 2, 1987.
298—52 FR 42657; November 6, 1987.
300—52 FR 44401; November 19, 1987.
301—52 FR 46087; December 4, 1987.
302—53 FR 3565; February 5, 1988.
303—53 FR 3567; February 5, 1988.
305—53 FR 4629; February 17, 1988.
306—53 FR 10884; April 4, 1988.
307—53 FR 11612; April 7, 1988.
308—53 FR 11615; April 7, 1988.
309—53 FR 23742; June 23, 1988.
310—53 FR 23745; June 23, 1988.
311—53 FR 23748; June 23, 1988.
314—53 FR 27137; July 18, 1988.
315—53 FR 27141; July 18, 1988.
318—53 FR 32827; August 26, 1988.
319—53 FR 32830; August 26, 1988.
321—53 FR 33996; September 1, 1988.
324—53 FR 34701; September 7, 1988.
325—53 FR 34705; September 7, 1988.
326—53 FR 35080; September 9, 1988.
329—53 FR 37972; September 28, 1988.
330—53 FR 37975; September 28, 1988.
331—53 FR 37978; September 28, 1988.
332—53 FR 37982; September 28, 1988.
333—53 FR 38451; September 30, 1988.
35—53 FR 38456; September 30, 1988.
39—53 FR 38474; September 30, 1988.
41—53 FR 45861; November 14, 1988.
43—54 FR 2134; January 19, 1989.
14—54 FR 5938; February 7, 1989.
16—54 FR 10154; March 10, 1989.
17—54 FR 14967; April 14, 1989.
2—54 FR 29658; July 13, 1989.
3—54 FR 29663; July 13, 1989.
4—54 FR 29730; July 14, 1989.
5—54 FR 30554; July 21, 1989.
5—54 FR 31196; July 27, 1989.
—54 FR 35305; August 24, 1989.
—54 FR 38947; September 21, 1989.
—54 FR 38950; September 21, 1989.
—54 FR 39857; September 28, 1989.
—54 FR 39863; September 28, 1989.
—55 FR 433; January 5, 1990.
—55 FR 4157; February 6, 1990.
—55 FR 4159; February 6, 1990.
—55 FR 12790; April 5, 1990.
—55 FR 12793; April 5, 1990.
381—55 FR 12797; April 5, 1990.
385—55 FR 13491; April 10, 1990.
386—55 FR 13911; April 13, 1990.
389—55 FR 24246; June 15, 1990.
392—55 FR 25599; June 21, 1990.
395—55 FR 29370; July 19, 1990.
397—55 FR 32255; August 8, 1990.
398—55 FR 32257; August 8, 1990.
402—55 FR 39864; September 28, 1990.
403—55 FR 39867; September 28, 1990.
406—55 FR 49050; November 26, 1990.
409—55 FR 50187; December 5, 1990.
413—56 FR 1453; January, 14, 1991.
414—56 FR 1457; January, 14, 1991.
418—56 FR 1936; January, 18, 1991.
420—56 FR 16024; April 19, 1991.
422—56 FR 19959; May 1, 1991.
424—56 FR 21091; May 7, 1991.
425—56 FR 21096; May 7, 1991.
429—56 FR 32983; July 18, 1991.
430—56 FR 34154; July 26, 1991.
434—56 FR 46239; September 11, 1991.
435—56 FR 47694; September 20, 1991.
436—56 FR 47699; September 20, 1991.
437—56 FR 48751; September 20, 1991.
438—56 FR 48755; September 20, 1991.
439—56 FR 49636; September 30, 1991.
440—56 FR 49639; September 30, 1991.
441—56 FR 49643; September 30, 1991.
445—56 FR 49853; October 2, 1991.
448—56 FR 55785; October 29, 1991.
450—56 FR 57849; November 14, 1991.
451—56 FR 60937; November 29, 1991.
452—56 FR 60940; November 29, 1991.
453—56 FR 61182; December 2, 1991.
457—57 FR 1403; January 14, 1992.
458—57 FR 2053; January 17, 1992.
460—57 FR 14653; April 22, 1992.
461—57 FR 14785; April 22, 1992.
463—57 FR 19819; May 8, 1992.
464—57 FR 20588; May 13, 1992.
465—57 FR 20592; May 13, 1992.
466—57 FR 20595; May 13, 1992.
467—57 FR 20787; May 15, 1992.
468—57 FR 21564; May 20, 1992.
470—57 FR 21574; May 20, 1992.
471—57 FR 24199; June 8, 1992.
472—57 FR 27858; June 22, 1992.
473—57 FR 27863; June 22, 1992.
474—57 FR 27867; June 22, 1992.
476—57 FR 30168; July 8, 1992.
477—57 FR 44340; September 25, 1992.
478—57 FR 44708; September 29, 1992.
480—57 FR 46339; October 8, 1992.
481—57 FR 46344; October 8, 1992.
482—57 FR 46747; October 28, 1992.
490—58 FR 8242; February 12, 1993.
491—58 FR 11552; February 26, 1993.
497—58 FR 18035; April 7, 1993.

498—58 FR 18041; April 7, 1993.
500—58 FR 25754; April 27, 1993.
501—58 FR 25758; April 27, 1993.
504—58 FR 32311; June 9, 1993.
506—58 FR 35891; July 2, 1993.
507—58 FR 37443; July 12, 1993.
509—58 FR 40547; July 28, 1993.
510—58 FR 40551; July 28, 1993.
511—58 FR 41383; August 3, 1993.
512—58 FR 41391; August 3, 1993.
515—58 FR 49879; September 23, 1993.
519—58 FR 52030; October 6 1993.
521—58 FR 53807; October 10/18/93.
523—58 FR 62050; November 24, 1993.
524—58 FR 68480; December 27, 1993
528—59 FR 5510; February 4 1994.
529—59 FR 8141; February 18 1994.
530—59 FR 9327; February 25, 1994.
531—59 FR 10324; March 2, 1994.
532—59 FR 10324; March 4, 1994.
535—59 FR 13840; March 23, 1994.
536—59 FR 14493; March 28, 1994.
537—59 FR 15345; April 1, 1994.
541—59 FR 32937; June 27, 1994.
542—59 FR 35864; July 14, 1994.
544—59 FR 42176; August 17, 1994.
547—59 FR 43652; August 24, 1994.
548—59 FR 43652; August 24, 1994.
551—59 FR 46718; September 9, 1994.
553—59 FR 49031; September 26, 1994.
555—59 FR 49863; September 30, 1994.
556—59 FR 50857; October 6, 1994.
558—59 FR 56333; November 10, 1994.
559—59 FR 56350; November 10, 1994.
560—59 FR 59177; November 16, 1994.
564—59 FR 60568; November 25, 1994.
565—59 FR 62352; December 5, 1994.
567—59 FR 64623; December 15, 1994.
570—60 FR 61; January 3, 1995.
572—60 FR 3562; January 18, 1995.
575—60 FR 6684; February 3, 1995.
578—60 FR 12846; March 7, 1995.
581—60 FR 10697; March 15, 1996.
584—61 FR 31058; June 19, 1996.
586—61 FR 41023; August 7, 1996.
587—61 FR 43184; August 21, 1996.

[48 FR 34182, July 27, 1983]

EDITORIAL NOTE 1: For FEDERAL REGISTER citations affecting the table in §17.12(h), see the listing above.

EDITORIAL NOTE: For FEDERAL REGISTER citations affecting §17.12, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

Subpart C—Endangered Wildlife

§ 17.21 Prohibitions.

(a) Except as provided in subpart A of this part, or under permits issued pursuant to §17.22 or §17.23, it is unlawful for any person subject to the jurisdiction of the United States to commit, to attempt to commit, to solicit another to commit or to cause to be committed, any of the acts described in paragraphs (b) through (f) of this section in regard to any endangered wildlife.

(b) *Import or export.* It is unlawful to import or to export any endangered wildlife. Any shipment in transit through the United States is an importation and an exportation, whether or not it has entered the country for customs purposes.

(c) *Take.* (1) It is unlawful to take endangered wildlife within the United States, within the territorial sea of the United States, or upon the high seas. The high seas shall be all waters seaward of the territorial sea of the United States, except waters officially recognized by the United States as the territorial sea of another country, under international law.

(2) Notwithstanding paragraph (c)(1) of this section, any person may take endangered wildlife in defense of his own life or the lives of others.

(3) Notwithstanding paragraph (c)(1) of this section, any employee or agent of the Service, any other Federal land management agency, the National Marine Fisheries Service, or a State conservation agency, who is designated by his agency for such purposes, may, when acting in the course of his official duties, take endangered wildlife without a permit if such action is necessary to:

(i) Aid a sick, injured or orphaned specimen; or

(ii) Dispose of a dead specimen; or

(iii) Salvage a dead specimen which may be useful for scientific study; or

(iv) Remove specimens which constitute a demonstrable but nonimmediate threat to human safety, provided that the taking is done in a humane manner; the taking may involve killing or injuring only if it has not been reasonably possible to eliminate such threat by live-capturing and releasing

the specimen unharmed, in a remote area.

(4) Any taking pursuant to paragraphs (c) (2) and (3) of this section must be reported in writing to the U.S. Fish and Wildlife Service, Division of Law Enforcement, P.O. Box 19183, Washington, DC 20036, within 5 days. The specimen may only be retained, disposed of, or salvaged in accordance with directions from Service.

(5) Notwithstanding paragraph (c)(1) of this section, any qualified employee or agent of a State Conservation Agency which is a party to a Cooperative Agreement with the Service in accordance with section 6(c) of the Act, who is designated by his agency for such purposes, may, when acting in the course of his official duties take those endangered species which are covered by an approved cooperative agreement for conservation programs in accordance with the Cooperative Agreement, provided that such taking is not reasonably anticipated to result in:

(i) The death or permanent disabling of the specimen;

(ii) The removal of the specimen from the State where the taking occurred;

(iii) The introduction of the specimen so taken, or of any progeny derived from such a specimen, into an area beyond the historical range of the species; or

(iv) The holding of the specimen in captivity for a period of more than 45 consecutive days.

(d) *Possession and other acts with unlawfully taken wildlife.* (1) It is unlawful to possess, sell, deliver, carry, transport, or ship, by any means whatsoever, any endangered wildlife which was taken in violation of paragraph (c) of this section.

Example. A person captures a whooping crane in Texas and gives it to a second person, who puts it in a closed van and drives thirty miles, to another location in Texas. The second person then gives the whooping crane to a third person, who is apprehended with the bird in his possession. All three have violated the law—the first by illegally taking the whooping crane; the second by transporting an illegally taken whooping crane; and the third by possessing an illegally taken whooping crane.

(2) Notwithstanding paragraph (d)(1) of this section, Federal and State law enforcement officers may possess, deliver, carry, transport or ship any endangered wildlife taken in violation of the Act as necessary in performing their official duties.

(e) *Interstate or foreign commerce.* It is unlawful to deliver, receive, carry, transport, or ship in interstate or foreign commerce, by any means whatsoever, and in the course of a commercial activity, any endangered wildlife.

(f) *Sale or offer for sale.* (1) It is unlawful to sell or to offer for sale in interstate or foreign commerce any endangered wildlife.

(2) An advertisement for the sale of endangered wildlife which carries a warning to the effect that no sale may be consummated until a permit has been obtained from the U.S. Fish and Wildlife Service shall not be considered an offer for sale within the meaning of this section.

(g) *Captive-bred wildlife.* (1) Notwithstanding paragraphs (b), (c), (e) and (f) of this section, any person may take; import or export; deliver, receive, carry, transport or ship in interstate or foreign commerce, in the course of a commercial activity; or sell or offer for sale in interstate or foreign commerce any endangered wildlife that is bred in captivity in the United States, provided the principal purpose of these activities is to facilitate captive breeding, and provided the following conditions are met:

(i) The wildlife is a species having a natural geographic distribution not including any part of the United States, or the wildlife is a species that the Director has determined to be eligible in accordance with paragraph (g)(5) of this section;

(ii) The purpose of such activity is to enhance the propagation or survival of the affected species;

(iii) Such activity does not involve interstate or foreign commerce, in the course of a commercial activity, with respect to non-living wildlife;

(iv) Each specimen of wildlife to be imported is uniquely identified by a band, tattoo or other means that was reported in writing to an official of the Service at a port of export prior to export from the United States, and

(v) Any person subject to the jurisdiction of the United States who engages in any of the activities authorized by this paragraph does so in accordance with paragraphs (g) (2), (3) and (4) of this section.

(2) Any person subject to the jurisdiction of the United States seeking to engage in any of the activities authorized by this paragraph must first register with the Service (Federal Wildlife Permit Office, U.S. Fish and Wildlife Service, Washington, DC 20240). Requests for registration must be submitted on an official application form (Form 3-200) provided by the Service, and must include the following information:

(i) The types of wildlife sought to be covered by the registration, identified by common and scientific name to the taxonomic level of family, genus or species;

(ii) A description of the applicant's experience in maintaining and propagating the types of wildlife sought to be covered by the registration, or in conducting research directly related to maintaining and propagating such wildlife;

(iii) A description, if appropriate, of the means by which the applicant intends to educate the public about the ecological role and conservation needs of the affected species;

(iv) Photograph(s) or other evidence clearly depicting the facilities where such wildlife will be maintained; and

(v) A copy of the applicant's license or registration, if any, under the animal welfare regulations of the U.S. Department of Agriculture (9 CFR part 2).

(3) Upon receiving a complete application, the Director will decide whether or not the registration will be approved. In making his decision, the Director will consider, in addition to the general criteria in §13.2(b) of this subchapter, whether the expertise, facilities or other resources available to the applicant appear adequate to enhance the propagation or survival of the affected wildlife. Each person so registered must maintain accurate written records of activities conducted under the registration and must submit to the Director a written annual report of such activities.

(4) Any person subject to the jurisdiction of the United States seeking to export or conduct foreign commerce in captive-bred endangered wildlife which will not remain under the care of that person must first obtain approval by providing written evidence to satisfy the Director that the proposed recipient of the wildlife has expertise, facilities or other resources adequate to enhance the propagation or survival of such wildlife and that the proposed recipient will use such wildlife for purposes of enhancing the propagation or survival of the affected species.

(5)(i) The Director shall use the following criteria to determine if wildlife of any species having a natural geographic distribution that includes any part of the United States is eligible for the provisions of this paragraph:

(A) Whether there is a low demand for taking of the species from wild populations, either because of the success of captive breeding or because of other reasons, and

(B) Whether the wild populations of the species are effectively protected from unauthorized taking as a result of the inaccessibility of their habitat to man or as a result of the effectiveness of law enforcement.

(ii) The Director shall follow the procedures set forth in section 4(b) and section 4(f)(2)(A) of the Act and in the regulations promulgated thereunder with respect to petitions and notification of the public and governors of affected States when determining the eligibility of species for purposes of this paragraph.

(iii) In accordance with the criteria in paragraph (g)(5)(i) of this section, the Director has determined the following species to be eligible for the provisions of this paragraph:

Laysan teal (*Anas laysanensis*).

[40 FR 44415, Sept. 26, 1975, as amended at 40 FR 53400, Nov. 18, 1975; 41 FR 19226, May 11, 1976; 44 FR 31580, May 31, 1979; 44 FR 54007, Sept. 17, 1979; 58 FR 68325, Dec. 27, 1993]

§ 17.22 Permits for scientific purposes, enhancement of propagation or survival, or for incidental taking.

Upon receipt of a complete application, the Director may issue a permit authorizing any activity otherwise prohibited by §17.21, in accordance with the issuance criteria of this section, for scientific purposes, for enhancing the

propagation or survival, or for the incidental taking of endangered wildlife. Such permits may authorize a single transaction, a series of transactions, or a number of activities over a specific period of time. (See § 17.32 for permits for threatened species.) The Director shall publish notice in the FEDERAL REGISTER of each application for a permit that is made under this section. Each notice shall invite the submission from interested parties, within 30 days after the date of the notice, of written data, views, or arguments with respect to the application. The 30-day period may be waived by the Director in an emergency situation where the life or health of an endangered animal is threatened and no reasonable alternative is available to the applicant. Notice of any such waiver shall be published in the FEDERAL REGISTER within 10 days following issuance of the permit.

(a)(1) *Application requirements for permits for scientific purposes or for the enhancement of propagation or survival.* Applications for permits under this paragraph must be submitted to the Director, U.S. Fish and Wildlife Service, Federal Wildlife Permit Office, 1000 N. Glebe Road, Room 611, Arlington, Virginia 22201, by the person wishing to engage in the activity prohibited by §17.21. Each application must be submitted on an official application (Form 3–200) provided by the Service and must include as an attachment, all of the following information:

(i) The common and scientific names of the species sought to the covered by the permit, as well as the number, age, and sex of such species, and the activity sought to be authorized (such as taking, exporting, selling in interstate commerce);

(ii) A statement as to whether, at the time of application, the wildlife sought to be covered by the permit (A) is still in the wild, (B) has already been removed from the wild, or (C) was born in captivity;

(iii) A resume of the applicant's attempts to obtain the wildlife sought to be covered by the permit in a manner which would not cause the death or removal from the wild of such wildlife;

(iv) If the wildlife sought to be covered by the permit has already been removed from the wild, the country and place where such removal occurred; if the wildlife sought to be covered by the permit was born in captivity, the country and place where such wildlife was born;

(v) A complete description and address of the institution or other facility where the wildlife sought to be covered by the permit will be used, displayed, or maintained;

(vi) If the applicant seeks to have live wildlife covered by the permit, a complete description, including photographs or diagrams, of the facilities to house and/or care for the wildlife and a resume of the experience of those person who will be caring for the wildlife;

(vii) A full statement of the reasons why the applicant is justified in obtaining a permit including the details of the activities sought to be authorized by the permit;

(viii) If the application is for the purpose of enhancement of propagation, a statement of the applicant's willingness to participate in a cooperative breeding program and to maintain or contribute data to a studbook;

(ix) The information collection requirements contained in this paragraph have been approved by the Office of Management and Budget under 44 U.S.C. 3507 and assigned Clearance Number 1018–0022. This information is being collected to provide information necessary to evaluate permit applications and make decisions, according to criteria established in various Federal wildlife and plant conservation statutes and regulations, on the issuance or denial of permits. The obligation to respond is required to obtain or retain a permit.

(2) *Issuance criteria.* Upon receiving an application completed in accordance with paragraph (a)(1) of this section, the Director will decide whether or not a permit should be issued. In making this decision, the Director shall consider, in addition to the general criteria in §13.21(b) of this subchapter, the following factors:

(i) Whether the purpose for which the permit is required is adequate to justify removing from the wild or otherwise changing the status of the wildlife sought to be covered by the permit;

(ii) The probable direct and indirect effect which issuing the permit would have on the wild populations of the wildlife sought to be covered by the permit;

(iii) Whether the permit, if issued, would in any way, directly or indirectly, conflict with any known program intended to enhance the survival probabilities of the population from which the wildlife sought to be covered by the permit was or would be removed;

(iv) Whether the purpose for which the permit is required would be likely to reduce the threat of extinction facing the species of wildlife sought to be covered by the permit;

(v) The opinions or views of scientists or other persons or organizations having expertise concerning the wildlife or other matters germane to the application; and

(vi) Whether the expertise, facilities, or other resources available to the applicant appear adequate to successfully accomplish the objectives stated in the application.

(3) *Permit conditions.* In addition to the general conditions set forth in part 13 of this subchapter, every permit issued under this paragraph shall be subject to the special condition that the escape of living wildlife covered by the permit shall be immediately reported to the Service office designated in the permit.

(4) *Duration of permits.* The duration of permits issued under this paragraph shall be designated on the face of the permit.

(b)(1) *Application requirements for permits for incidental taking.* Applications for permits under this paragaph must be submitted to the Director, U.S. Fish and Wildlife Service, Federal Wildlife Permit Office, 1000 N. Glebe Road, Room 611, Arlington, Virginia 22201, by the person wishing to engage in the activity prohibited by §17.21(c). Each application must be submitted on an official application (Form 3–200) provided by the Service and must include as an attachment all of the following information:

(i) A complete description of the activity sought to be authorized;

(ii) The common and scientific names of the species sought to be covered by the permit, as well as the number, age, and sex of such species, if known;

(iii) A conservation plan that specifies:

(A) The impact that will likely result from such taking;

(B) What steps the applicant will take to monitor, minimize, and mitigate such impacts, the funding that will be available to implement such steps, and the procedures to be used to deal with unforeseen circumstances;

(C) What alternative actions to such taking the applicant considered and the reasons why such alternatives are not proposed to be utilized; and

(D) Such other measures that the Director may require as being necessary or appropriate for purposes of the plan;

(iv) The information collection requirements contained in this paragraph have been approved by the Office of Management and Budget under 44 U.S.C. 3507 and assigned Clearance Number 1018–0022. This information is being collected to provide information necessary to evaluate permit applications. This information will be used to review permit applications and make decisions, according to criteria established in various Federal wildlife and plant conservation statutes and regulations, on the issuance or denial of permits. The obligation to respond is required to obtain or retain a permit.

(2) *Issuance criteria.* Upon receiving an application completed in accordance with paragraph (b)(1) of this section, the Director will decide whether or not a permit should be issued. The Director shall consider the general criteria in §13.21(b) of this subchapter and shall issue the permit if he finds that: (i) The taking will be incidental; (ii) the applicant will, to the maximum extent practicable, minimize and mitigate the impacts of such taking; (iii) the applicant will ensure that adequate funding for the conservation plan and procedures to deal with unforeseen circumstances will be provided; (iv) the taking will not appreciably reduce the likelihood of the survival and recovery of the species in the wild; (v) the measures, if any, required under paragraph (b)(1)(iii)(D) of this section will be met; and (vi) he has received such other assurances as he may require that the plan will be implemented. In making

his decision, the Director shall also consider the anticipated duration and geographic scope of the applicant's planned activities, including the amount of listed species habitat that is involved and the degree to which listed species and their habitats are affected.

(3) *Permit conditions.* In addition to the general conditions set forth in part 13 of this subchapter, every permit issued under this paragraph shall contain such terms and conditions as the Director deems necessary or appropriate to carry out the purposes of the permit and the conservation plan including, but not limited to, monitoring and reporting requirements deemed necessary for determining whether such terms and conditions are being complied with. The Director shall rely upon existing reporting requirements to the maximum extent practicable.

(4) *Duration of permits.* The duration of permits issued under this paragraph shall be sufficient to provide adequate assurances to the permittee to commit funding necessary for the activities authorized by the permit, including conservation activities and land use restrictions. In determining the duration of a permit, the Director shall consider the duration of the planned activities, as well as the possible positive and negative effects associated with permits of the proposed duration on listed species, including the extent to which the conservation plan will enhance the habitat of listed species and increase the long-term survivability of such species.

(c) *Objection to permit issuance.* (1) In regard to any notice of a permit application published in the FEDERAL REGISTER, any interested party that objects to the issuance of a permit, in whole or in part, may, during the comment period specified in the notice, request notification of the final action to be taken on the application. A separate written request shall be made for each permit application. Such a request shall specify the Service's permit application number and state the reasons why that party believes the applicant does not meet the issuance criteria contained in §§ 13.21 and 17.22 of this subchapter or other reasons why the permit should not be issued.

(2) If the Service decides to issue a permit contrary to objections received pursuant to paragraph (c)(1) of this section, then the Service shall, at least ten days prior to issuance of the permit, make reasonable efforts to contact by telephone or other expedient means, any party who has made a request pursuant to paragraph (c)(1) of this section and inform that party of the issuance of the permit. However, the Service may reduce the time period or dispense with such notice if it determines that time is of the essence and that delay in issuance of the permit would: (i) Harm the specimen or population involved; or (ii) unduly hinder the actions authorized under the permit.

(3) The Service will notify any party filing an objection and request for notice under paragraph (c)(1) of this section of the final action taken on the application, in writing. If the Service has reduced or dispensed with the notice period referred to in paragraph (c)(2) of this section, it will include its reasons therefore in such written notice.

[50 FR 39687, Sept. 30, 1985]

§ 17.23 Economic hardship permits.

Upon receipt of a complete application, the Director may issue a permit authorizing any activity otherwise prohibited by § 17.21, in accordance with the issuance criteria of this section in order to prevent undue economic hardship. The Director shall publish notice in the FEDERAL REGISTER of each application for a permit that is made under this section. Each notice shall invite the submission from interested parties, within 30 days after the date of the notice, of written data, views, or arguments with respect to the application. The 30-day period may be waived by the Director in an emergency situation where the life or health of an endangered animal is threatened and no reasonable alternative is available to the applicant. Notice of any such waiver shall be published in the FEDERAL REGISTER within 10 days following issuance of the permit.

(a) *Application requirements.* Applications for permits under this section must be submitted to the Director by the person allegedly suffering undue economic hardship because his desired activity is prohibited by § 17.21. Each

application must be submitted on an official application form (Form 3–200) provided by the Service, and must include, as an attachment, all of the information required in § 17.22 plus the following additional information:

(1) The possible legal, economic or subsistence alternatives to the activity sought to be authorized by the permit;

(2) A full statement, accompanied by copies of all relevant contracts and correspondence, showing the applicant's involvement with the wildlife sought to be covered by the permit (as well as his involvement with similar wildlife), including, where applicable, that portion of applicant's income derived from the taking of such wildlife, or the subsistence use of such wildlife, during the calendar year immediately preceding either the notice in the FEDERAL REGISTER of review of the status of the species or of the proposal to list such wildlife as endangered, whichever is earliest;

(3) Where applicable, proof of a contract or other binding legal obligation which:

(i) Deals specifically with the wildlife sought to be covered by the permit;

(ii) Became binding prior to the date when the notice of a review of the status of the species or the notice of proposed rulemaking proposing to list such wildlife as endangered was published in the FEDERAL REGISTER, whichever is earlier; and

(iii) Will cause monetary loss of a given dollar amount if the permit sought under this section is not granted.

(b) *Issuance criteria.* Upon receiving an application completed in accordance with paragraph (a) of this section, the Director will decide whether or not a permit should be issued under any of the three categories of economic hardship, as defined in section 10(b)(2) of the Act. In making his decisions, the Director shall consider, in addition to the general criteria in § 13.21(b) of this subchapter, the following factors:

(1) Whether the purpose for which the permit is being requested is adequate to justify removing from the wild or otherwise changing the status of the wildlife sought to be covered by the permit;

(2) The probable direct and indirect effect which issuing the permit would have on the wild populations of the wildlife sought to be covered by the permit;

(3) The economic, legal, subsistence, or other alternatives or relief available to the applicant;

(4) The amount of evidence that the applicant was in fact party to a contract or other binding legal obligation which;

(i) Deals specifically with the wildlife sought to be covered by the permit; and

(ii) Became binding prior to the date when the notice of a review of the status of the species or the notice of proposed rulemaking proposing to list such wildlife as endangered was published in the FEDERAL REGISTER, whichever is earlier.

(5) The severity of economic hardship which the contract or other binding legal obligation referred to in paragraph (b)(4) of this section would cause if the permit were denied;

(6) Where applicable, the portion of the applicant's income which would be lost if the permit were denied, and the relationship of that portion to the balance of his income;

(7) Where applicable, the nature and extent of subsistence taking generally by the applicant; and

(8) The likelihood that applicant can reasonably carry out his desired activity within one year from the date a notice is published in the FEDERAL REGISTER to review status of such wildlife, or to list such wildlife as endangered, whichever is earlier.

(c) *Permit conditions.* In addition to the general conditions set forth in part 13 of this subchapter, every permit issued under this section shall be subject to the following special conditions:

(1) In addition to any reporting requirements contained in the permit itself, the permittee shall also submit to the Director a written report of his activities pursuant to the permit. Such report must be postmarked or actually delivered no later than 10 days after completion of the activity.

(2) The death or escape of all living wildlife covered by the permit shall be immediately reported to the Service's office designated in the permit.

(d) Duration of permits issued under this section shall be designated on the face of the permit. No permit issued under this section, however, shall be valid for more than one year from the date a notice is published in the FEDERAL REGISTER to review status of such wildlife, or to list such wildlife as endangered, whichever is earlier.

[40 FR 44415, Sept. 26, 1975, as amended at 40 FR 53400, Nov. 18, 1975; 40 FR 58307, Dec. 16, 1975; 50 FR 39688, Sept. 30, 1985]

Subpart D—Threatened Wildlife

§ 17.31 Prohibitions.

(a) Except as provided in subpart A of this part, or in a permit issued under this subpart, all of the provisions in § 17.21 shall apply to threatened wildlife, except § 17.21(c)(5).

(b) In addition to any other provisions of this part 17, any employee or agent of the Service, of the National Marine Fisheries Service, or of a State conservation agency which is operating a conservation program pursuant to the terms of a Cooperative Agreement with the Service in accordance with section 6(c) of the Act, who is designated by his agency for such purposes, may, when acting in the course of his official duties, take those threatened species of wildlife which are covered by an approved cooperative agreement to carry out conservation programs.

(c) Whenever a special rule in §§ 17.40 to 17.48 applies to a threatened species, none of the provisions of paragraphs (a) and (b) of this section will apply. The special rule will contain all the applicable prohibitions and exceptions.

[43 FR 18181, Apr. 28, 1978, as amended at 44 FR 31580, May 31, 1979]

§ 17.32 Permits—general.

Upon receipt of a complete application the Director may issue a permit for any activity otherwise prohibited with regard to threatened wildlife. Such permit shall be governed by the provisions of this section unless a special rule applicable to the wildlife, appearing in §§ 17.40 to 17.48, of this part provides otherwise. Permits issued under this section must be for one of the following purposes: Scientific purposes, or the enhancement of propagation or survival, or economic hardship, or zoological exhibition, or educational purposes, or incidental taking, or special purposes consistent with the purposes of the Act. Such permits may authorize a single transaction, a series of transactions, or a number of activities over a specific period of time.

(a)(1) *Application requirements for scientific purposes, or the enhancement of propagation or survival, or economic hardship, or zoological exhibition, or educational purposes, or special purposes consistent with the purposes of the Act.* Applications for permits under this paragraph must be submitted to the Director, U.S. Fish and Wildlife Service, Federal Wildlife Permit Office, 1000 N. Glebe Road, Room 611, Arlington, Virginia 22201, by the person wishing to engage in the prohibited activity. Each application must be submitted on an official application (Form 3–200), provided by the Service, and must include, as an attachment, as much of the following information which relates to the purpose for which the applicant is requesting a permit:

(i) The Common and scientific names of the species sought to be covered by the permit, as well as the number, age, and sex of such species, and the activity sought to be authorized (such as taking, exporting, selling in interstate commerce);

(ii) A statement as to whether, at the time of application, the wildlife sought to be covered by the permit (A) is still in the wild, (B) has already been removed from the wild, or (C) was born in captivity;

(iii) A resume of the applicant's attempts to obtain the wildlife sought to be covered by the permit in a manner which would not cause the death or removal from the wild of such wildlife;

(iv) If the wildlife sought to be covered by the permit has already been removed from the wild, the country and place where such removal occurred; if the wildlife sought to be covered by permit was born in captivity, the country and place where such wildlife was born;

(v) A complete description and address of the institution or other facility where the wildlife sought to be covered by the permit will be used, displayed, or maintained;

(vi) If the applicant seeks to have live wildlife covered by the permit, a complete description, including photographs or diagrams, of the facilities to house and/or care for the wildlife and a resume of the experience of those persons who will be caring for the wildlife;

(vii) A full statement of the reasons why the applicant is justified in obtaining a permit including the details of the activities sought to be authorized by the permit;

(viii) If the application is for the purpose of enhancement of propagation, a statement of the applicant's willingness to participate in a cooperative breeding program and to maintain or contribute data to a studbook;

(ix) The information collection requirements contained in this paragraph have been approved by the Office of Management and Budget under 44 U.S.C. 3507 and assigned Clearance Number 1018–0022. This information is being collected to provide information necessary to evaluate permit applications and make decisions, according to criteria established in various Federal wildlife and plant conservation statutes and regulations, on the issuance or denial of permits. The obligation to respond is required to obtain or retain a permit.

(2) *Issuance criteria.* Upon receiving an application completed in accordance with paragraph (a)(1) of this section, the Director will decide whether or not a permit should be issued. In making this decision, the Director shall consider, in addition to the general criteria in § 13.21(b) of this subchapter, the following factors:

(i) Whether the purpose for which the permit is required is adequate to justify removing from the wild or otherwise changing the status of the wildlife sought to be covered by the permit;

(ii) The probable direct and indirect effect which issuing the permit would have on the wild populations of the wildlife sought to be covered by the permit;

(iii) Whether the permit, if issued, would in any way, directly or indirectly, conflict with any known program intended to enhance the survival probabilities of the population from which the wildlife sought to be covered by the permit was or would be removed;

(iv) Whether the purpose for which the permit is required would be likely to reduce the threat of extinction facing the species of wildlife sought to be covered by the permit;

(v) The opinions or views of scientists or other persons or organizations having expertise concerning the wildlife or other matters germane to the application; and

(vi) Whether the expertise, facilities, or other resources available to the applicant appear adequate to successfully accomplish the objectives stated in the application.

(3) *Permit conditions.* In addition to the general conditions set forth in part 13 of this subchapter, every permit issued under this paragraph shall be subject to the special condition that the escape of living wildlife covered by the permit shall be immediately reported to the Service office designated in the permit.

(4) *Duration of permits.* The duration of permits issued under this paragraph shall be designated on the face of the permit.

(b)(1) *Application requirements for permits for incidental taking.* (i) Applications for permits under this paragraph must be submitted to the Director, U.S. Fish and Wildlife Service, Federal Wildlife Permit Office, 1000 N. Glebe Road, Room 611, Arlington, VA 22201, by the person wishing to engage in the activity prohibited by § 17.31.

(ii) The director shall publish notice in the FEDERAL REGISTER of each application for a permit that is made under this section. Each notice shall invite the submission from interested parties, within 30 days after the date of the notice, of written data, views, or arguments with respect to the application.

(iii) Each application must be submitted on an official application (Form 3–200) provided by the Service, and must include as an attachment, all of the following information:

(A) A complete description of the activity sought to be authorized;

(B) The common and scientific names of the species sought to be covered by the permit, as well as the number, age, and sex of such species, if known;

(C) A conservation plan that specifies:

(*1*) The impact that will likely result from such taking;

(*2*) What steps the applicant will take to monitor, minimize, and mitigate such impacts, the funding that will be available to implement such steps, and the procedures to be used to deal with unforeseen circumstances;

(*3*) What alternative actions to such taking the applicant considered and the reasons why such alternatives are not proposed to be utilized; and

(*4*) Such other measures that the Director may require as being necessary or appropriate for purposes of the plan.

(iv) The information collection requirements contained in this paragraph have been approved by the Office of Management and Budget under 44 U.S.C. 3507 and assigned Clearance Number 1018–0022. This information is being collected to provide information necessary to evaluate permit applications and make decisions, according to criteria established in various Federal wildlife and plant conservation statutes and regulations on the issuance or denial of permits. The obligation to respond is required to obtain or retain a permit.

(2) *Issuance criteria.* Upon receiving an application completed in accordance with paragraph (b)(1) of this section, the Director will decide whether or not a permit should be issued. The Director shall consider the general criteria in § 13.21(b) of this subchapter and shall issue the permit if he finds that: (i) The taking will be incidental; (ii) the applicant will, to the maximum extent practicable, minimize and mitigate the impacts of such taking; (iii) the applicant will ensure that adequate funding for the conservation plan and procedures to deal with unforeseen circumstances will be provided; (iv) the taking will not appreciably reduce the likelihood of the survival and recovery of the species in the wild; (v) the measures, if any, required under paragraph (b)(1)(iii)(D) will be met; and (vi) he has received such other assurances as he may require that the plan will be implemented. In making his decision, the Director shall also consider the anticipated duration and geographic scope of the applicant's planned activities, including the amount of listed species habitat that is involved and the degree to which listed species and their habitats are affected.

(3) *Permit conditions.* In addition to the general conditions set forth in part 13 of this subchapter, every permit issued under this paragraph shall contain such terms and conditions as the Director deems necessary or appropriate to carry out the purposes of the permit and the conservation plan including, but not limited to, monitoring and reporting requirements deemed necessary for determining whether such terms and conditions are being complied with. The Director shall rely upon existing reporting requirements to the maximum extent practicable.

(4) *Duration of permits.* The duration of permits issued under this paragraph shall be sufficient to provide adequate assurances to the permittee to commit funding necessary for the activities authorized by the permit, including conservation activities and land use restrictions. In determining the duration of a permit, the Director shall consider the duration of the planned activities, as well as the possible positive and negative effects associated with permits of the proposed duration on listed species, including the extent to which the conservation plan will enhance the habitat of listed species and increase the long-term survivability of such species.

[50 FR 39689, Sept. 30, 1985]

§ 17.40 Special rules—mammals.

(a) [Reserved]

(b) Grizzly bear (*Ursus arctos*)—(1) *Prohibitions.* The following prohibitions apply to the grizzly bear:

(i) *Taking.* (A) Except as provided in paragraphs (b)(1)(i)(B) through (F) of this section, no person shall take any grizzly bear in the 48 conterminous states of the United States.

(B) Grizzly bears may be taken in self-defense or in defense of others, but such taking shall be reported, within 5 days of occurrence, to the Assistant Regional Director, Division of Law Enforcement, U.S. Fish and Wildlife Service, P.O. Box 25486, Denver Federal

Center, Denver, Colorado 80225 (303/236–7540 or FTS 776–7540), if occurring in Montana or Wyoming, or to the Assistant Regional Director, Division of Law Enforcement, U.S. Fish and Wildlife Service, Lloyd 500 Building, Suite 1490, 500 Northeast Multnomah Street, Portland, Oregon 97232 (503/231–6125 or FTS 429–6125), if occurring in Idaho or Washington, and to appropriate State and Indian Reservation Tribal authorities. Grizzly bears or their parts taken in self-defense or in defense of others shall not be possessed, delivered, carried, transported, shipped, exported, received, or sold, except by Federal, State, or Tribal authorities.

(C) *Removal of nuisance bears.* A grizzly bear consituting a demonstrable but non immediate threat to human safety or committing significant depredations to lawfully present livestock, crops, or beehives may be taken, but only if:

(*1*) It has not been reasonably possible to eliminate such threat or depredation by live-capturing and releasing unharmed in a remote area the grizzly bear involved; and

(*2*) The taking is done in a humane manner by authorized Federal, State, or Tribal authorities, and in accordance with current interagency guidelines covering the taking of such nuisance bears; and

(*3*) The taking is reported within 5 days of occurrence to the appropriate Assistant Regional Director, Division of Law Enforcement, U.S. Fish and Wildlife Service, as indicated in paragraph (b)(1)(i)(B) of this section, and to appropriate State and Tribal authorities.

(D) *Federal, State, or Tribal scientific or research activities.* Federal, State, or Tribal authorities may take grizzly bears for scientific or research purposes, but only if such taking does not result in death or permanent injury to the bears involved. Such taking must be reported within 5 days of occurrence to the appropriate Assistant Regional Director, Division of Law Enforcement, U.S. Fish and Wildlife Service, as indicated in paragraph (b)(1)(i)(B) of this section, and to appropriate State and Tribal authorities.

(E) [Reserved]

(F) *National Parks.* The regulations of the National Park Service shall govern all taking of grizzly bears in National Parks.

(ii) *Unlawfully taken grizzly bears.* (A) Except as provided in paragraphs (b)(1)(ii)(B) and (iv) of this section, no person shall possess, deliver, carry, transport, ship, export, receive, or sell any unlawfully taken grizzly bear. Any unlawful taking of a grizzly bear shall be reported within 5 days of occurrence to the appropriate Assistant Regional Director, Division of Law Enforcement, U.S. Fish and Wildlife Service, as indicated in paragraph (b)(1)(i)(B) of this section, and to appropriate State and Tribal authorities.

(B) Authorized Federal, State, or Tribal employees, when acting in the course of their official duties, may, for scientific or research purposes, possess, deliver, carry, transport, ship, export, or receive unlawfully taken grizzly bears.

(iii) *Import or export.* Except as provided in paragraphs (b)(1)(iii) (A) and (B) and (iv) of this section, no person shall import any grizzly bear into the United States.

(A) *Federal, State, or Tribal scientific or research activities.* Federal, State, or Tribal authorities may import grizzly bears into the United States for scientific or research purposes.

(B) *Public zoological institution.* Public zoological institutions (see 50 CFR 10.12) may import grizzly bears into the United States.

(iv) *Commercial transactions.* (A) Except as provided in paragraph (b)(1)(iv)(B) of this section, no person shall, in the course of commercial activity, deliver, receive, carry, transport, or ship in interstate or foreign commerce any grizzly bear.

(B) A public zoological institution (see 50 CFR 10.12) dealing with other public zoological institutions may sell grizzly bears or offer them for sale in interstate or foreign commerce, and may, in the course of commercial activity, deliver, receive, carry, transport, or ship grizzly bears in interstate or foreign commerce.

(v) *Other violations.* No person shall attempt to commit, cause to be committed, or solicit another to commit

FINAL

HABITAT CONSERVATION PLAN

In Support of the Issuance of a Section 10(a) Permit for Incidental Take of the Endangered Delhi Sands Flower-loving Fly in Connection with the Development of Approximately 65 Acres in the City of Rialto, California

Prepared for:

The Edward Antonini Residuary Trust
Angelus Block Company, Inc.
And
E-Z Mix, Inc.

Prepared by:

Michael Brandman Associates
15901 Red Hill Avenue, Suite 200
Tustin, California 92780
(714) 258-8100

Contact: Gregg Miller, Project Manager

July 1, 1999

TABLE OF CONTENTS

Appendices

LIST OF TABLES

LIST OF EXHIBITS

EXECUTIVE SUMMARY

This Habitat Conservation Plan (HCP) is submitted in support of incidental take permit applications for the federally endangered Delhi Sands Flower-loving Fly (*Rhaphiomidas terminatus abdominalis*) (DSF) in connection with development of approximately 65 acres for industrial and other uses in Rialto, California (Proposed Action). The Site is owned by the Edward Antonini Residuary Trust. The DSF is termed the "Covered Species" because it is the species for which incidental take is to be authorized pursuant to the Proposed Action. The Permit Applicants are: the Edward Antonini Residuary Trust, Angelus Block Company, Inc., and E-Z Mix, Inc.

The Applicant's Proposed Action consists of (1) the development or sale of up to approximately 65 acres (herein after Development Area or Developable Permit Area) of the 96-acre Project Site for industrial, commercial, or other development and the operation of such facilities over a 30-year period, and (2) the implementation of an HCP which establishes an approximately 30.5-acre conservation area (Conservation Area) in the northern portion of the Project Site (including a 5-acre mitigation bank) for conservation of the DSF and perhaps other species.

The Conservation Area would be dedicated in fee title to a wildlife conservation organization at no cost, to be used for the recovery and conservation of the DSF. An endowment fund would be established to provide funds for annual maintenance, adaptive management, and to respond to changed circumstances in the Conservation Area in perpetuity. Five acres of mitigation credits within the Conservation Area will be available for purchase to mitigate for either direct impacts to DSF resulting in take of DSF, or for impacts to DSF habitat, on other properties. Proceeds from the sale of mitigation credits would be used to help defray the Applicants costs in establishing the Conservation Area and endowment fund.

It may be possible to assemble and/or restore approximately 62 acres of contiguous potentially restorable habitat for conservation of the DSF by connecting the approximately 30.5-acre Project Site Conservation Area with other off-site adjacent and nearby habitat which may be dedicated for DSF conservation.

A long-term conservation benefit to the DSF is expected from the Proposed Action. With respect to the DSF, no DSF were observed on the Project Site during three consecutive years of surveys (1995, 1996, and 1997). During 1998 surveys there were 4 observations of DSF on a single day within the proposed Conservation Area. In the view of the Applicants the Delhi Sands soils and the habitat they support that occur on the Site are generally degraded, with small patches of vegetation of a composition and density associated with potential use by DSF in the northern and central portion of the site. These small patches are interspersed within approximately 30 acres of habitat generally unsuitable for DSF. It could be argued that the data from the 1998 surveys indicate that a small (approximately one acre) portion of the Site within the Conservation Area appears occupied by DSF. Thus, it is possible that the removal of approximately 43 acres of potentially restorable habitat containing Delhi Sands soils as called for in the Proposed Action could result in the take of a small but unknown number of DSF under the ESA over the course of the next thirty years. Although development of the Project Site may result in the take of a small but unknown number of DSF under the ESA, for purposes of this HCP and Section 10(a) permit application, the level of take is defined as the loss of any and all DSF that are taken incidentally during activities associated with the Proposed Action across the 96 acre Project Site.

SECTION 1
INTRODUCTION

The Edward Antonini Residuary Trust ("Antonini Trust") owns approximately 96 contiguous acres in the City of Rialto, County of San Bernardino, California ("Project Site" or "Site") (Exhibit 1). The Site is zoned for heavy industrial use. The Site is located in Section 36, Township 1 south, Range 5 west of the U.S. Geological Service (USGS) "San Bernardino South" 7.5 minute quadrangle. The Site is located south of Interstate 10 in the City of Rialto ("City") and is bounded to the west by Riverside Avenue and Industrial Drive, the southeast by Agua Mansa Road and the south by the intersection of Riverside Avenue and Agua Mansa Road (Exhibit 2). The northern boundary of a Southern California Edison ("SCE") easement forms the north/northeastern boundary of the Site. This easement lies within the Site, and the underlying fee interest is owned by the Antonini Trust (Exhibit 3).

The Site consists of two adjoining parcels (Exhibit 3). The Site was purchased in 1989 by the Antonini Trust. A parcel map was approved by the City for the larger of the two parcels (approximately 87.5 acres in size) on the Site in 1991. The final parcel map was approved by the City on March 17, 1998. This larger parcel is currently subdivided into 22 lots for heavy industrial use. The second parcel lies to the immediate east of the first, and is approximately 8.4 acres in size. Two access streets would traverse portions of the larger parcel, entering from the western boundary along Industrial Drive or Riverside Avenue and terminating approximately midway across the larger parcel in cul-de-sacs. Approximately 21 acres of the Site along the entire northeastern boundary are subject to a public utility easement for electrical transmission purposes granted to SCE.

The Site lies within the Agua Mansa Enterprise Zone ("AMEZ"), an approximately 9,000-acre area within portions of the cities of Colton, Rialto, and Riverside and the counties of Riverside and San Bernardino. These five jurisdictions have executed a Joint Powers Agreement establishing the Agua Mansa Industrial Growth Association ("AMIGA"). The AMEZ seeks to encourage industrial development of this area through various tax and other economic incentives. There are approximately 4,000 acres of vacant land remaining in the AMEZ.

The Antonini Trust is preparing to proceed with the development of the larger parcel for industrial uses. Lots 11, 12, 13, 14 and 15 are currently anticipated to be used for a sacking plant and facility for concrete, preblended mortar, asphalt and associated materials. This facility, known as the E-Z Mix East Complex, would be operated by Angelus Block Company, Inc. ("Angelus Block"). Lots 4, 5, 6, 7, 8, 9, and 10 are intended for use by Angelus Block for a paver production plant. A portion of Lot 1 is intended for use as a concrete block plant. The other lots are expected to be sold to other industrial users for development.

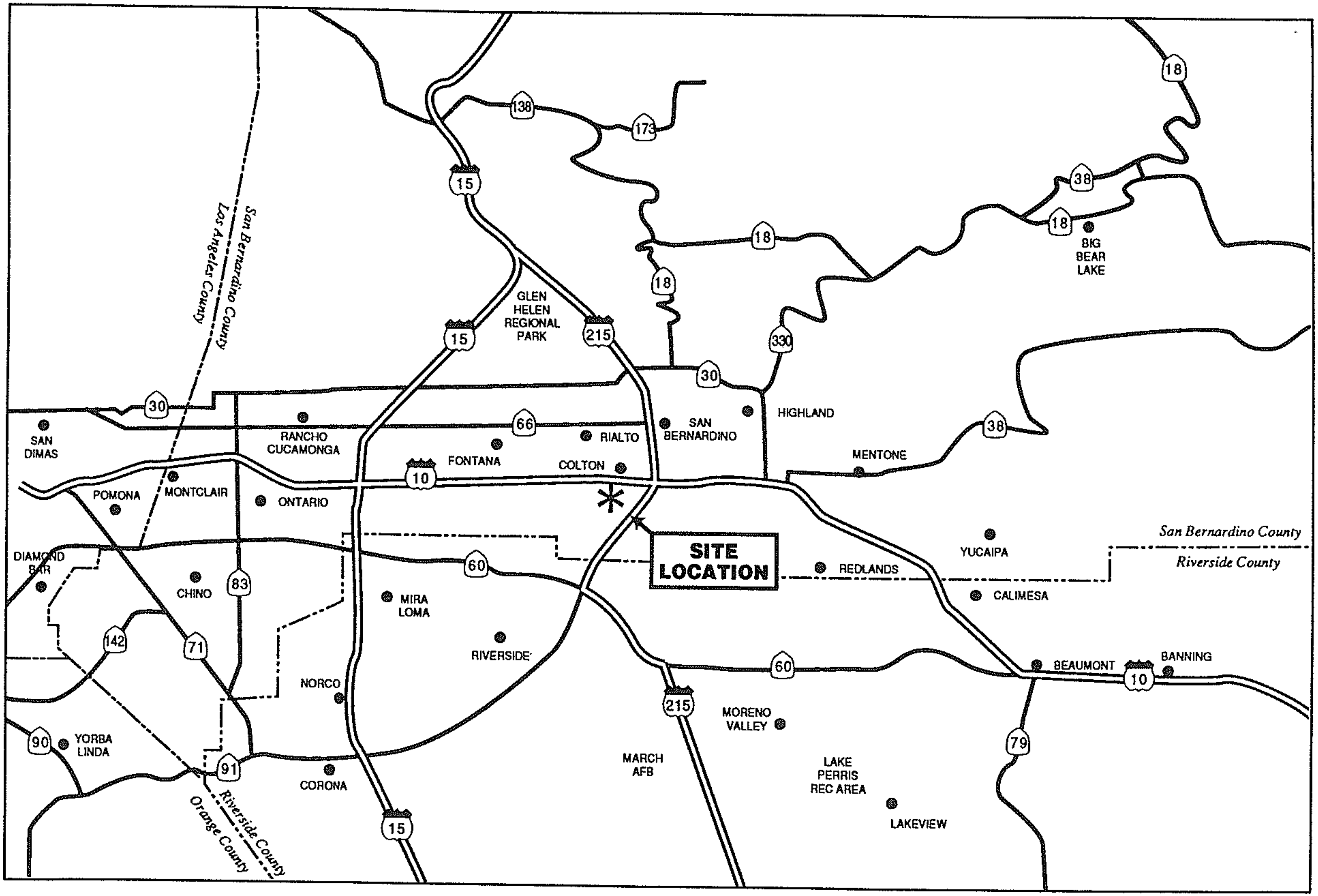
In 1990 and 1992, SCE executed agreements with Angelus Block, acknowledging that Angelus Block could conduct grading operations and store concrete block and related product and equipment and items within the area subject to SCE's nonexclusive easement for electrical transmission purposes without interfering with SCE's rights pursuant to its easement. Angelus Block's manufacturing facilities and the parcel map for the Site have been designed to utilize the areas within the SCE easement for Angelus Block's operational needs. Concrete block, related product and equipment storage would occur on either side of a 16-foot wide road bisecting the length of the SCE easement area. The road would be used to access the three SCE transmission towers and the material stored in this area.

The Site has obtained the necessary local government entitlements for development and use for industrial purposes. Additional grading, building pad construction, interior road extensions, associated utilities installation, and storm drain system construction must still be conducted. Given the amount of land set-asides proposed in the HCP, it is estimated that less than 10 industrial users could ultimately be located on the Site.

Subsequent to the City's approval of the parcel map in 1991, the USFWS listed the DSF as endangered under the ESA. A final rule listing the DSF as "endangered" under ESA was published by the USFWS in the Federal Register on September 23, 1993 (USFWS 1993). The DSF is not a listed species under the California Endangered Species Act ("CESA"). In fact, CESA does not permit the listing of insects under the statute. The site is located within the 40-square mile area of the believed historic range of the DSF. Delhi Sands soils are present on most of the Site (USDA 1980), as depicted in Exhibit 4; more detailed soil surveys of the Site have not been done. Approximately 67 acres of the 87.5-acre parcel contain Delhi Sands soils and are thus potentially restorable as DSF habitat.

Angelus Block engaged Michael Brandman Associates (MBA) to conduct focused surveys in 1995, 1996, 1997 and 1998 for the DSF on the entire 96-acre Project Site according to then-applicable USFWS survey protocol during the species' single annual flight period (August - September), since the Project Site was located within the believed historic range of the species. The 1998 surveys were conducted according to protocols pre-approved by USFWS (see Section 3).

The Project Site's vegetation is dominated by ruderal (weedy) species which have re-colonized the site since the Site was disced for fuel reduction in April 1997. Most of the Site is dominated by the native annual bur-sage and the non-native Russian thistle (*Salsola tragus*) and mustard (*Hirshfeldia incana*). Other generally distributed common species are the non-native grasses, wild oats (*Avena fatua*), ripgut brome (*Bromus diandrus)*, and foxtail chess (*Bromus madritensis ssp. rubens*). In the small eroded washes and a few other small patches, a few additional native species are prevalent, including California croton (*Croton californicum)*, tarweed (*Hemizonia fasciculata*), and fiddleneck, (*Amsinckia intermedia*). The native telegraph weed (*Heterotheca grandiflora*) is common in places. In a few sparsely vegetated sandy unpaved roadways and in small patches of relatively open sand distributed occasionally to frequently within the



Michael Brandman Associates

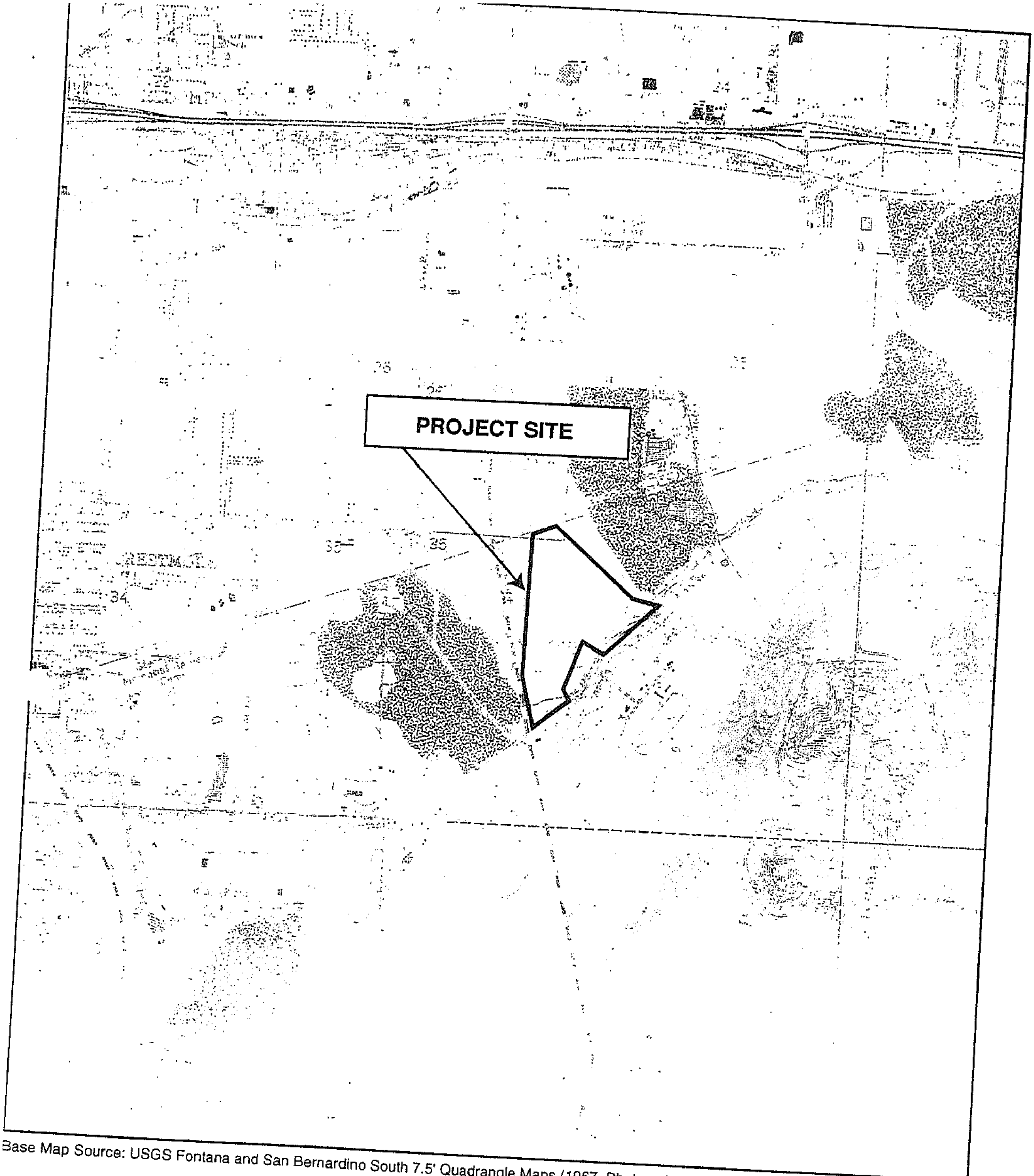
NORTH

20620002 • 4/98

Exhibit 1

Site Vicinity Map

ANTONINI TRUST / ANGELUS BLOCK • DELHI SANDS FLOWER-LOVING FLY HCP/EA



Base Map Source: USGS Fontana and San Bernardino South 7.5' Quadrangle Maps (1967, Photorevised 1980).

NORTH

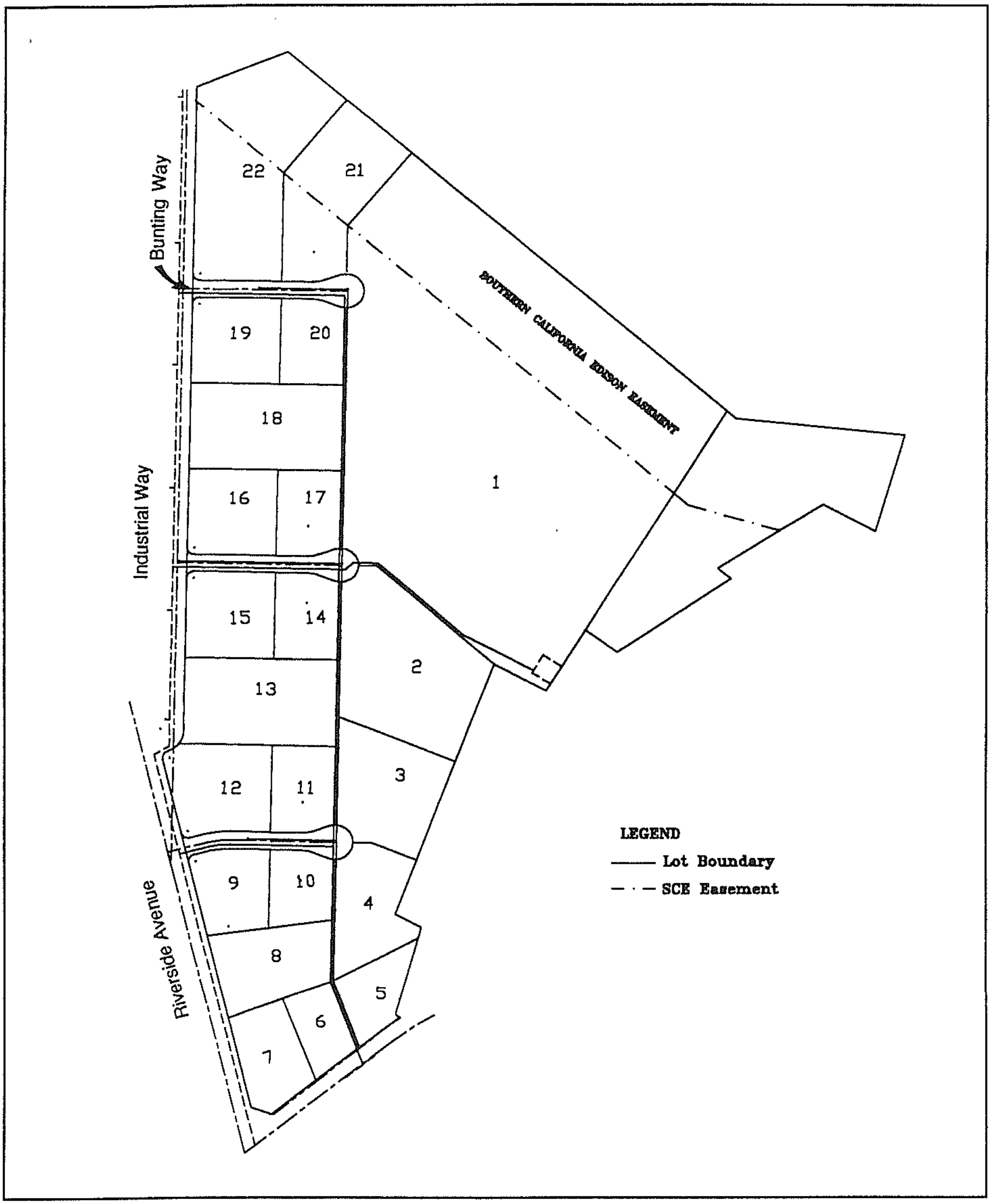
2000 1000 0 2000
SCALE IN FEET

Mic[illegible] Brandman Associates

20620002 • 2/98

Exhibit 2
Site Location Map

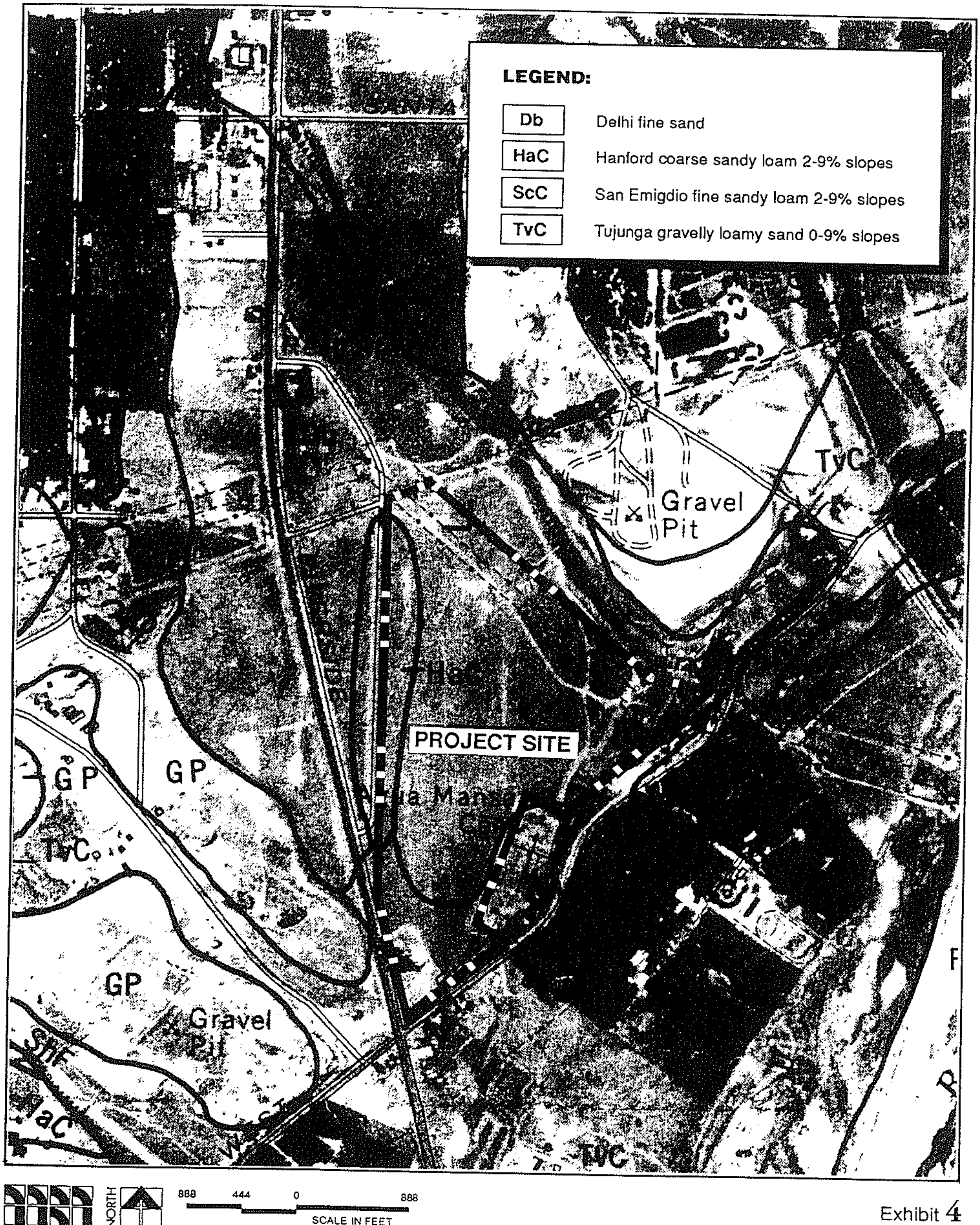
ANTONINI TRUST / ANGELUS BLOCK • DELHI SANDS FLOWER-LOVING FLY HCP/EA



NORTH

Exhibit 3

Site Plan



Michael Brandman Associates

Exhibit 4
Project Site and Vicinity Soils

20620002 • 4/98

ANTONINI TRUST / ANGELUS BLOCK • DELHI SANDS FLOWER-LOVING FLY HCP/EA

otherwise typically dense vegetation cover, a few additional native species are prevalent, including California croton, tarweed, and fiddleneck. Vegetation of this particular character is largely found dispersed across a 20- to 30-acre area in the northwestern portion of the Project Site that contains the proposed Conservation Area. Castorbean (*Ricinis communis*) and annual sunflower (*Helianthus annuus*) are common in the drainage ditch bordering Agua Mansa Road. The slope along the upper one-half of the Site's southeastern border is covered with a dense growth of non-native grasses, among which occur sparsely most of the other plant species mentioned above, as well as brittlebush (*Encelia farinosa*), valley cholla (*Opuntia parryi*), calabazilla (*Cucurbita foetidissima*), wild cucumber (*Marah macrocarpus*), jimson weed (*Datura wrightii*), and a few individuals of California buckwheat (*Eriogonum fasciculatum*).

Of the relatively low total of 41 species of plants detected on the Project Site, 19 are non-native, and seven of the remaining 22 natives are weedy in nature. Vegetation cover on the Site varies from 100 percent to less than 5 percent; most of the Site supports cover exceeding 90 percent. Overall, the herbaceous/grass layer averages about 80 percent cover. Adult DSF do not appear to use areas of dense cover where annual grasses or native buckwheat exceed 50% cover (USFWS 1997). Sparse vegetation (less than 50% cover) and sandy substrates are the primary habitat requirements of flies in the genus *Rhaphiomidas* (USFWS 1997). Vegetation cover in the 10- 20 percent range appears to be optimal cover for *Rhaphiomidas* flies (USFWS 1997). (In the view of the Applicants, most of the Project Site is considered to provide generally unsuitable habitat for the DSF particularly the portions of the Site that do not include the proposed Conservation Area.)

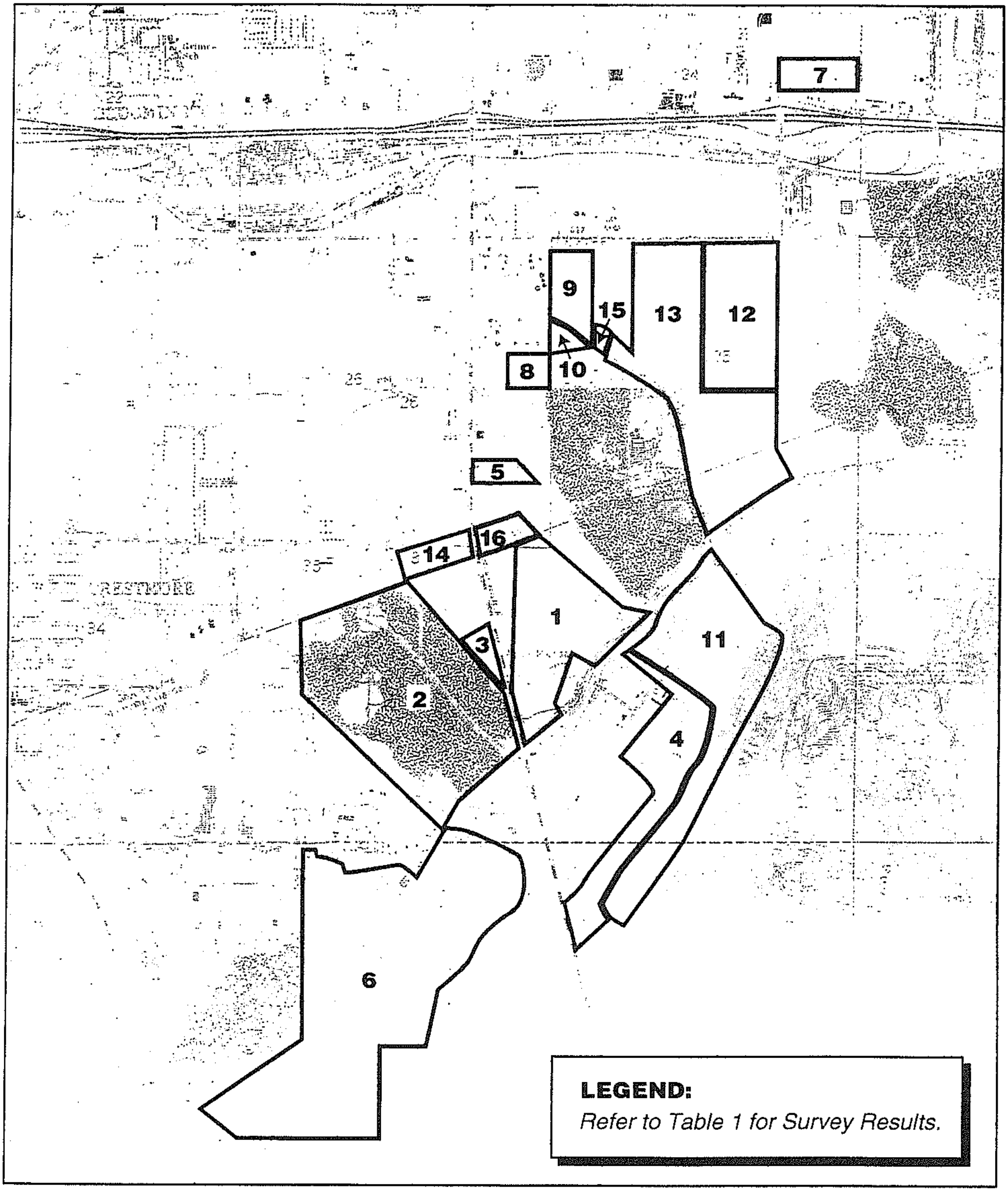
Prior to 1998, three consecutive years (1995-97) of DSF surveys were completed for the Site in accordance with the field methods called for in the USFWS recommended survey protocol (although surveys in 1996 did not begin until the third week of that year's flight season). Over 216 hours of surveys were conducted during appropriate survey periods and under weather conditions suitable for observation of DSF by trained biologists with experience with DSF. Appendices A, B and C contain copies of the survey reports. During the 1995-97 surveys no DSF were detected on the Site. The 1995-97 survey data indicated that the Site was not occupied by DSF, nor was the Site used for feeding, sheltering, breeding, or other behavioral patterns essential to the species, although several sightings of the DSF have been made on other properties in the vicinity of the Project Site (see Exhibit 5). The data on the Site's habitat conditions and the known habitat associations of DSF supported the 1995-97 survey results. Details of MBA's 1995, 1996 and 1997 surveys are discussed at greater length in Section 3.

The Applicants began preparing an HCP for the property in 1997, after three years of surveys showed no DSF on the Site. Although the three years of data indicated that the Project Site was not occupied, the Applicants still desired to obtain a Section 10(a) Permit in order to facilitate a more orderly and certain development schedule regarding future development of the Site. Complete build-out of the site is expected to occur over a period of years. Given the mobile nature of the species, the observations of the species on certain properties in the vicinity of the site and the potential for changing biological conditions on surrounding properties and the project site over a period of years, such certainty was desired for proper land use planning and investment.

After the initial HCP was prepared and at the request of USFWS, additional focused surveys were conducted in 1998. Forty hours of surveys were conducted in 1998 on the Site during appropriate survey periods and under weather conditions suitable for observation of DSF by MBA. During the 1998 surveys there were 4 DSF observations on a single day of the surveys. No DSF were observed mating, ovipositing, or feeding. The nature of the four observations indicate that most likely 3 individual DSF were present: 2 males and 1 female. The observations all occurred in a localized area of the Site within the proposed Conservation Area (Exhibit 6), in an area which had recently been disturbed between June 1996 and February 1997 for the construction of an underground water pipeline). Details of the 1998 surveys are discussed at greater length in Section 3. (Appendix D contains a copy of the 1998 survey report). Thus, it could be argued that development of the Project Site may result in the take of a small but unknown number of DSF under the ESA.

The USFWS Habitat Conservation Planning Handbook provides that the level of incidental take authorized by a Permit can be expressed either in terms of individual members of the species to be taken, or in terms of habitat acres in cases where the number of individuals is unknown or indeterminable. Using the number of habitat acres is appropriate for these Permit Applications because it is not possible to determine the number of DSF individuals which may be taken over the life of the permit. It is not possible to determine the number of DSF that may be taken because: (1) DSF spend the majority of their lives beneath the soil and there are no reliable methods to determine subsurface numbers that would not harm or injure DSF; (2) DSF have been detected on only one day during the most recent of four years of surveys of the Site conducted during the adult flight season, making judgements about ongoing presence or occupation of the Site by DSF problematic; and (3) relatively little is known generally about DSF biology. The Proposed Action will result in the loss of approximately 43 acres of Delhi Sands soil, which is the fundamental component of DSF habitat. The vast majority of this acreage (more than 90 to 95%) however is unsuitable for the DSF. The Applicants request the take to be authorized by the present Permits be stated as any and all DSF that are taken incidentally within the meaning of the ESA as a result of activities associated with the Proposed Action as described in Section 2 of this HCP on the 96 acres of the Site.

Although the three above-described facilities are planned for portions of the Site, this HCP is designed to accommodate any type of industrial, commercial, or other development and operation by any entity within the portion of the Site to be permitted for incidental take, namely the 15 lots and the 8.4-acre parcel in the eastern portion of the Site identified in Exhibit 7. Although E-Z Mix, Inc. is currently contemplating using Lots 11-15 for its sacking plant facility (also known as the "E-Z Mix East Complex") and Angelus Block is contemplating the use of a portion of Lot 1 for its concrete block plant and Lots 4-10 for its paver plant, this HCP is designed to allow for alternative industrial uses of these lots as well. As will be described in Section 5 of this HCP, the paver plant has been redesigned twice in the course of the biological analysis of the HCP



Base Map Source: USGS Fontana and San Bernardino South 7.5' Quadrangle Maps (1967, Photorevised 1980).

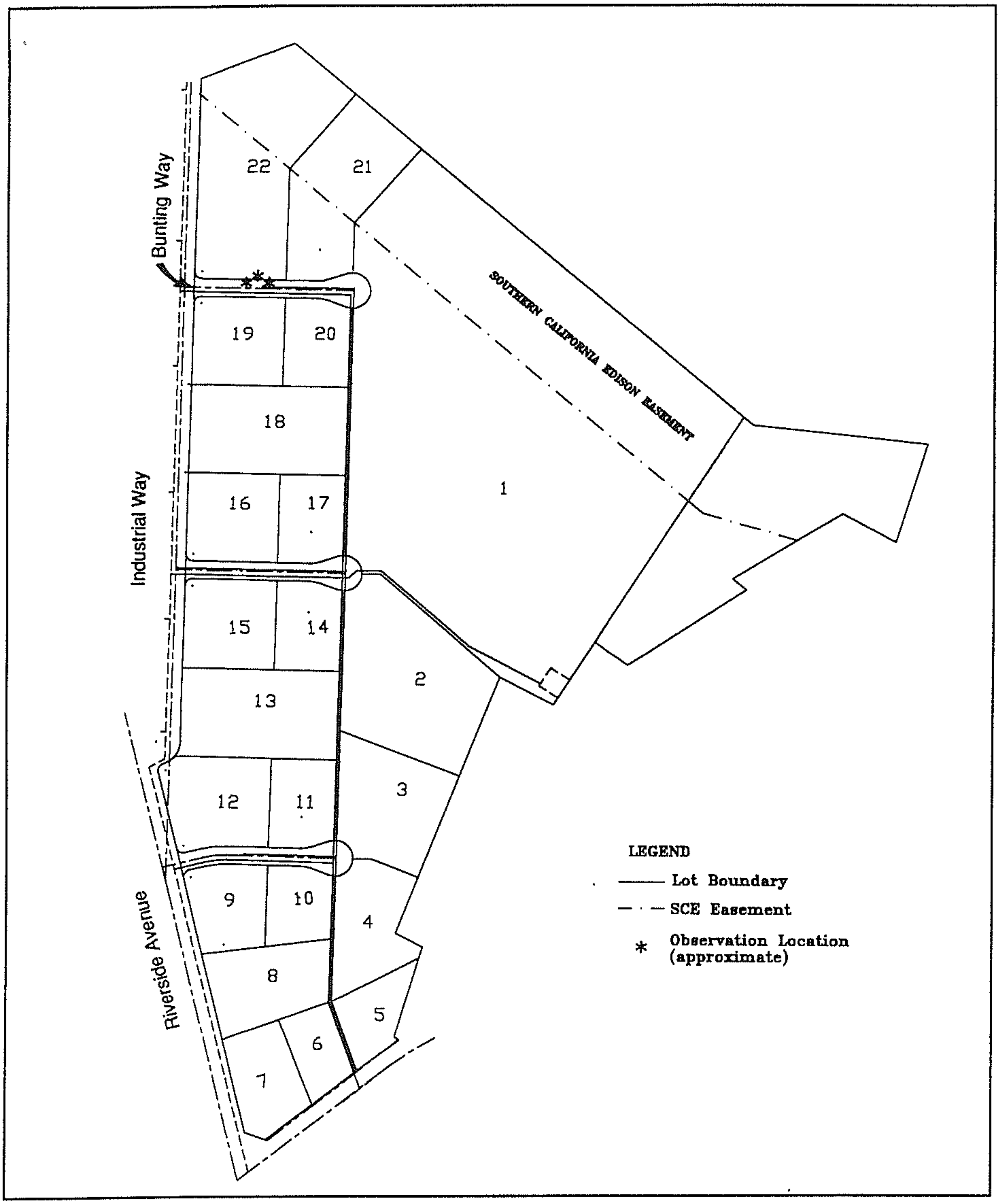
Michael Brandman Associates

NORTH

2000 1000 0 2000
SCALE IN FEET

Exhibit 5

Delhi Sands Flower-Loving Fly Survey Sites



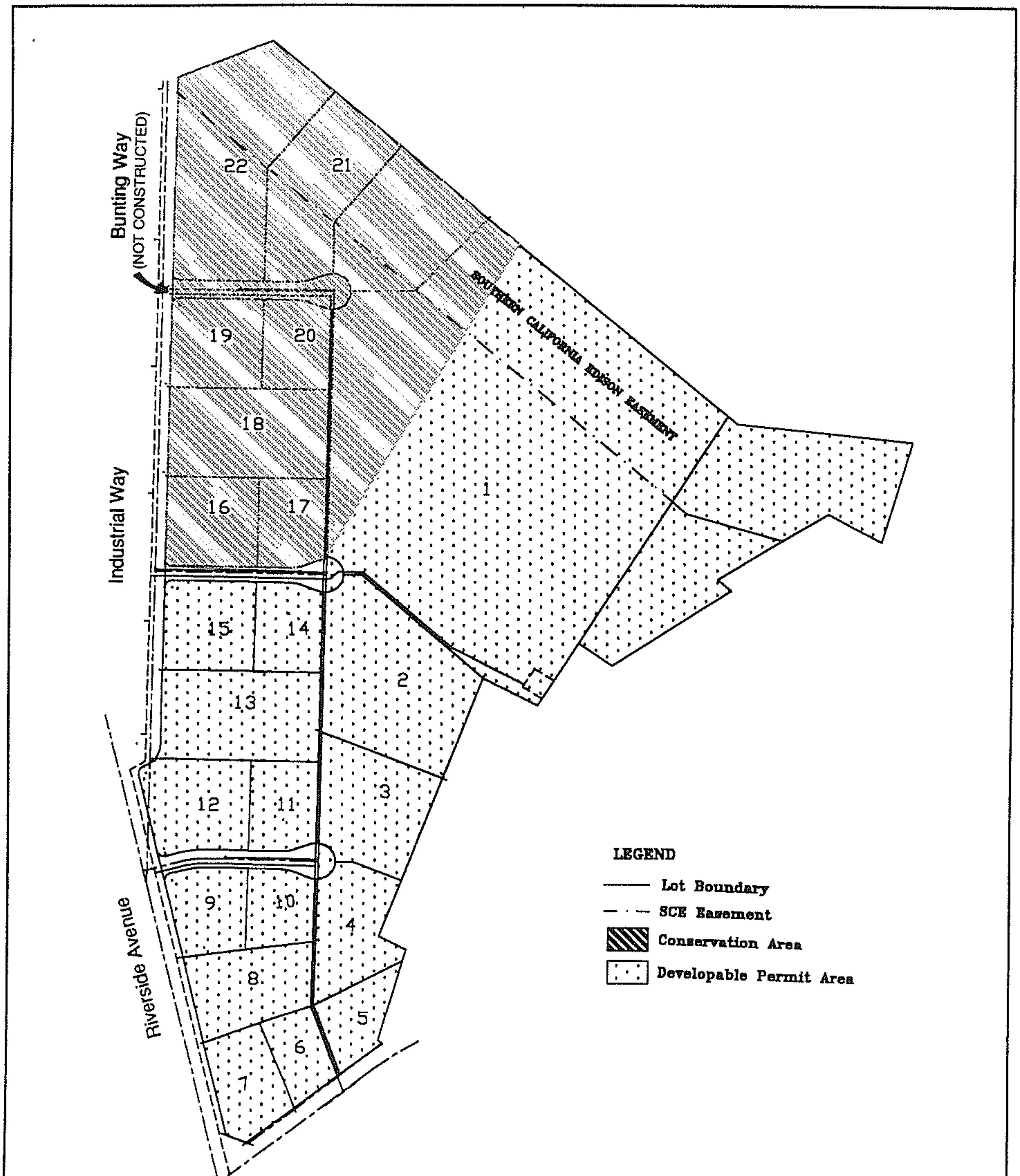
Michael Brandman Associates

Exhibit 6

Delhi Sands Flower-loving Fly 1998 Observations

20620002 • 11/98

ANTONINI TRUST / ANGELUS BLOCK • DELHI SANDS FLOWER-LOVING FLY HCP/EA



Note: Entire Project Site is to be covered by Incidental Take Authorization.

Michael Brandman Associates

Exhibit 7

Proposed Conservation Area

20620002 • 7/99

ANTONINI TRUST / ANGELUS BLOCK • DELHI SANDS FLOWER-LOVING FLY HCP/EA

to be located on Lots 4-10, as opposed to its originally designed location on Lots 21 and 22 and subsequently redesigned location on Lots 16-20.

As noted previously, the Applicants initiated this HCP even though three years of focused survey indicated that the DSF was absent for the site. The USFWS final Recovery Plan for the DSF promotes the adoption of voluntary conservation efforts by private landowners for the DSF. The Applicants recognized that land management activities and land use decisions by private landowners can assist in the recovery of the DSF if specifically designed for that purpose. Alternatively, some land management practices or land use decisions would not promote such recovery and can even be detrimental to recovery efforts. A major purpose of this HCP is to promote and ensure land management practices and land-use decisions which will benefit the DSF. The conservation of land in the HCP will benefit the DSF.

As noted above, portions of the Site may be sold to other industrial users. Moreover, full build-out may not be realized for many years. Thus, another major purpose of this HCP is to provide certainty to the development of a portion of the Site with respect to the potential for any future ESA constraints relative to the DSF.

The Section 10(a) permits will provide certainty that future development of various parcels on the Project Site will not result in a violation of Section 9 of the ESA. Such certainty is important to enable future development decision-making and financial commitments to proceed in an orderly fashion. In return for such assurances, the Permit Applicants would establish an approximately 30.5-acre conservation area for the DSF in the northern portion of the Project Site (the "Conservation Area"). The Applicants would also provide an endowment fund that would provide funds for annual maintenance, adaptive management, and to respond to changed circumstances in the Conservation Area in perpetuity. The Conservation Area is depicted in Exhibit 7. By ensuring for the conservation of a portion of the Project Site in perpetuity and by providing for this enhancement and expansion of DSF populations, the Applicants seek assurance that additional regulatory burdens will not be imposed upon them beyond these measures expressly provided for in the HCP. As set forth in the Implementing Agreement (IA), the permits will provide that landowners within the Project Site will be covered for DSF take resulting as an artifact of increased use of the Conservation Area through the implementation of this HCP. The Conservation Area would be enhanced and dedicated in fee title to a wildlife conservation organization or agency at no cost, to be used for the recovery and future conservation of the DSF. The IA also provides for the ability of the Applicants or their assigns to further enhance or use the Conservation Area for the benefit of other future listed species provided that: (1) USFWS approves such enhancement or use of the Conservation Area, and (2) such actions would not be expected to decrease the value of the Conservation Area for the DSF. If the USFWS determines in writing that such proposed enhancement would negatively impact the DSF, the USFWS may preclude such enhancement by the Permittees. Also, a 5-acre mitigation bank will be established as part of the approximately 30.5-acre Conservation Area.

Should DSF be drawn to or become established in the Conservation Area, the Applicants will be covered for any incidental take of any such DSF which may occur from development within the permit area or operations on the Site as the result of conservation efforts undertaken by the Applicants.

This HCP is designed to provide a net benefit to the DSF in perpetuity by preserving approximately 30.5 acres of potentially restorable habitat for the conservation of the DSF (containing some currently potentially suitable habitat for the DSF) and providing funds for maintenance of the Conservation Area. An endowment fund would be established to provide funds for annual maintenance, adaptive management, and to respond to changed circumstances in the Conservation Area in perpetuity. Currently, there is no protected habitat for the DSF on the Site. The proposed Conservation Area is immediately adjacent to other potentially restorable DSF habitat off-site that is being considered as a permanent conservation area for the DSF. The location of the Conservation Area on the Site has been selected to be contiguous with adjacent habitat which is being considered for dedication for DSF conservation. Assembling an approximately 62-acre contiguous DSF reserve may be possible by connecting the approximately 30.5-acre Project Site Conservation Area with adjacent off-site and nearby areas being considered for dedication for DSF conservation. This is more fully discussed in Section 3 of this HCP.

The HCP and Section 10(a) permits provide a means of achieving finality and certainty, allowing development of the Site to proceed without further concern regarding potential impact to DSF on the Site. The HCP and Section 10(a) permits will enable the Permit Applicants to set aside and conserve a portion of the Site to promote the recovery and conservation of the DSF.

SECTION 2
PURPOSE AND NEED FOR ACTION

The Permit Applicants have applied to the USFWS for Section 10(a)(1)(B) incidental take permits (Permits). The Permits would authorize incidental take of the DSF in the course of otherwise lawful activities associated with construction and operation of a variety of facilities on approximately 65 acres of the Site as well as management of a 30.5-acre Conservation Area. This HCP is intended to meet and exceed the requirements for issuance of permits under Section 10(a)(1)(B) of ESA for "take" of DSF that may occur during the course of development of and operations on the Project Site and other activities associated with the Proposed Action over time. Such incidental take authorization is desired by the Permit Applicants in order to provide sufficient certainty for future development and respond to the possibility that some incidental take could occur on the Site in connection with development, the Applicants' own conservation efforts, or through changes to the biological conditions of the surrounding property and/or Project Site.

The Applicants are committing to promote the long-term conservation of the DSF by dedicating fee title to approximately 30.5 acres that would be used for recovery and conservation of the DSF in the northern portion of the Site and providing an endowment fund for enhancement, annual maintenance, biological monitoring, reporting, adaptive management, and to respond to changed circumstances in the Conservation Area in perpetuity. The Conservation Area will be restricted through legal instrument, such as a Declaration of Restrictions, to require that the area be used for conservation purposes. As described more fully in Section 4 of this HCP, the Applicants will fence the Conservation Area and construct a sand retention fence along its southern boundary. The Conservation Area may be able to be combined with other property in the area for the conservation of the DSF. The Permits would also result in a significant contribution to the recovery and long-term conservation of the DSF by establishing in perpetuity an approximately 30.5 acre conservation area containing small scattered patches of suitable DSF habitat within a matrix of dense non-native vegetation (which habitat can be enhanced for the DSF) in an area that is geographically well positioned to be used for such purpose. The HCP is expected to provide a long-term net benefit to the DSF, especially considering the expected low level of effects on the DSF from the Proposed Action. The Applicants consider implementation of this HCP in connection with the Permits to be an effective means to promote the conservation needs of the DSF while serving the need for landowner certainty.

The needs and goals of the USFWS are to: (1) recover listed species, (2) ensure compliance with ESA, the National Environmental Policy Act (NEPA), and other applicable federal laws and regulations, and (3) obtain a voluntary and effective contribution towards securing the long-term viability of the DSF.

The actual number of DSF that might be taken as a result of the Proposed Action--although small, if any, is impossible to know with certainty. Approximately 43 acres of currently unoccupied but potentially restorable DSF habitat would be lost as a result of the Proposed Action. Although no DSF were observed during three consecutive years (1995-97) of focused DSF surveys, there were four (4) DSF observations on a single day during additional focused surveys conducted in 1998. The four (4) observations appear to represent three (3) DSF.

PROPOSED ACTION

The Permit Applicants propose to develop or sell approximately 57 acres of the larger parcel of the Site for industrial or other uses. An approximately 30.5-acre Conservation Area in the northern portion of the Site would be transferred in fee title to a conservation or wildlife organization or agency at no cost, to be used to promote the conservation of the DSF (see Exhibit 7). Concurrent with the issuance of the Section 10(a) Permits and prior to any ground disturbance on Lots 1, 2, or 3, the Conservation Area will be restricted in perpetuity by a legal instrument such as a recorded Declaration of Restrictions or similar mechanism, and the Applicants will provide an endowment fund, the annual proceeds of which will be used for ongoing maintenance, adaptive management, enhancement, monitoring, reporting, and to respond to changed circumstances in the Conservation Area. The Applicants would also construct a chain link fence around the Conservation Area to prevent unauthorized access, construct a solid fence along the southern boundary of the Conservation Area to prevent soil loss, and perform initial weed and trash removal to increase the suitability of the Conservation Area for the DSF. In consultation with the USFWS, Permittees shall conduct initial weed and trash removal, where appropriate, throughout the Conservation Area within six months of the effective date. Provided that field experience on the Project Site demonstrates it is practicable, such chain link fencing will also use silting screens along lower portions of the fence to assist with Delhi series sand retention within the Conservation Area. The Conservation Area will be posted with signs indicating that the area is environmentally sensitive and that trespassing is prohibited. The smaller 8.4-acre parcel is not currently planned for development.

As described and detailed more fully in the Implementing Agreement, a five (5) acre conservation bank will be established within the approximately 30.5 acre Conservation Area concurrent with, and as part of, the USFWS's approval of the HCP and the placement of a deed restriction on the Conservation Area for DSF conservation purposes. Antonini Trust will be able to sell conservation credits to other persons, companies, organizations, etc., ("Credit Purchasers") to satisfy, in whole or part as evaluated by the USFWS, their off-site mitigation needs associated with land disturbance activity within the Colton Recovery Unit. (The Colton Recovery Unit is identified in the USFWS's 1997 Final Recovery Plan for the DSF.) The Conservation Bank will have a total of five (5) acres of conservation credits to sell, and these credits may be sold and transferred in one-tenth (0.10) acre increments, or multiples thereof. The purchase of mitigation credits from the bank will not, of itself, authorize Incidental Take for projects purchasing mitigation credits. Those projects may require independent Incidental Take authorization. The USFWS would determine whether offsite mitigation is acceptable for any particular project within the Colton Recovery Unit and identify the amount of offsite mitigation required by such Credit Purchasers for their activities. Antonini Trust will be responsible for monitoring the remaining credits available and for maintaining an accounting of the amount, date, etc., of the credits sold and will update the USFWS with this information as required in the Implementing Agreement. Where the USFWS determines that off-site mitigation is appropriate on properties within the Colton DSF Recovery Unit, the conservation credits will be available for purchase to mitigate for either direct impacts to DSF resulting in take of DSF, or for impacts to DSF habitat, on properties within the Colton DSF Recovery Unit.

Two paved streets would be installed on portions of the western half of the Site, extending east from Riverside Avenue or Industrial Drive as shown in Exhibit 3. Curbs and gutters also would be installed. The Developable Permit Area of the Project Site would be graded, and construction and operation of industrial or other facilities would subsequently occur on those lots. Lot sizes are set at a minimum of 48,996 square feet and range to a maximum of 33.4 acres prior to implementation of the HCP. Utilities (electricity, sewer, water and the like) would be installed. All utilities are expected to be installed underground. Water lines already exist under a portion of the proposed Conservation Area. All required drainage facilities would be constructed outside the Conservation Area. The land within the SCE easement but outside the Conservation Area would be used for outdoor product storage. Materials to be stored outdoors are finished concrete block and concrete paver. No portion of the SCE easement within the Conservation Area would be used for storage. A network of access roads would be placed in the storage area, and the storage area may be graded. The only portion of the Site off limits to grading would be the Conservation Area.

Approximately 8.9 acres of the Conservation Area are currently subject to a non-exclusive easement in favor of SCE for solely electrical transmission purposes and would continue to remain so. SCE currently uses this area for such purpose. Limited portions of this 8.9-acre area would continue to be disturbed by SCE during maintenance activities; generally, disturbance can be expected to be confined to movement of equipment and persons on the existing dirt roadway. The existing dirt roadway used by SCE in this area would continue to be available and used by SCE. The roadway is used by SCE vehicles to access transmission towers that are outside of and to the west of the proposed Conservation Area. The dirt roadway is approximately 16 feet wide. Approximately every 6 weeks SCE washes the insulators on the transmission towers using pressurized water. The washing occurs outside the Conservation Area. SCE will not receive authorization for incidental take of DSF within the Conservation Area or the Permit Area by virtue of the Applicants Section 10(a) permits. Thus, SCE would continue to remain precluded from taking any action in the Conservation Area that would result in incidental take of any DSF in the absence of its own independent incidental take authorization from the USFWS.

The Permit Applicants seek incidental take authority for a period of thirty (30) years for the DSF. The number of DSF's that may be killed, harmed or harassed by the Proposed Action is impossible to quantify with precision. On the basis of current data and Site conditions, that number is expected to be low. Over time, some DSF may be impacted by development or operation of any of the facilities on the Site. In any event, the number impacted is expected to be far less than the number of new DSF produced and/or protected by virtue of the DSF's ultimate use of the Conservation Area, dedicated, enhanced and maintained by the Proposed Action. It could be argued that the biological data from 1998 surveys indicate that a small portion of the Project Site appears occupied by DSF. For purposes of the HCP and Section 10(a) Permit applications, it is assumed that a relatively small number of DSF may be incidentally taken by virtue of the development of a 65 acre Developable Permit Area and the management of the approximately 30.5-acre Conservation Area for species conservation purposes.

The time of full build-out of the Site is not known. Full build-out could take longer than 20 years depending upon economic and market conditions, which cannot be precisely predicted. The Conservation Area and the endowment fund will be established and set aside in perpetuity. The nature of the endowment fund and HCP allow for adaptive management of the Conservation Area to respond to changing conditions associated with the DSF, the Conservation Area, or the surrounding properties. For these reasons, a 30-year duration for the Permit is considered reasonable.

The Project Site is zoned for heavy industrial use. Within the City of Rialto zoning ordinances, heavy industrial uses include but are not limited to manufacturing, assembling, testing or processing of vehicles, batteries, candles, carpets, concrete products, glass, ink, motors, plastics, and steel products. A complete list of the potential uses of the lots within the Permit Area is contained in Appendix G. Any of these operations may occur within the lots within the Permit Area.

This HCP provides that the Permit Applicants would mitigate for any incidental take of DSF resulting from the Proposed Action, including the enhancement of the Conservation Area, through the conveyance of fee title to approximately 30.5 acres in the northern portion of the Site to a conservation or wildlife organization or agency acceptable to the USFWS for purposes of promoting the recovery and conservation of the DSF. Additionally the Applicants would establish an endowment fund to provide for enhancement and annual maintenance, adaptive management and to respond to changed circumstances in the Conservation Area in perpetuity for the benefit of the DSF. This protected land would complement other lands in the immediate area, which are being considered by others for protection as DSF habitat. As noted, it may be possible to assemble approximately 62 acres of contiguous habitat for DSF conservation by connecting the approximately 30.5-acre Project Site Conservation Area with adjacent and nearby potentially restorable habitat which may be dedicated for DSF conservation. Implementation of a DSF habitat restoration plan for the SCE parcels north and west of the Project Site is expected to begin in the near future. The parcels are approximately 19 acres in size and are contiguous with the proposed Conservation Area. This would result in approximately 50 acres of protected habitat for the DSF. Additionally the Owl Company has agreed to set aside 6+ acres of an 11-acre site along Riverside Avenue as dedicated land for DSF conservation. This would result in approximately 56 acres of land conserved for DSF.

MIGRATORY BIRD TREATY ACT

The Applicants recognize that the Section 10(a) Permits, should they be issued by the Service, do not relieve the Applicants from assuring compliance with thee Migratory Bird Treaty Act ("MBTA"). The Applicants will conduct grading or clearing activities within the Permit Area in compliance with the requirements of the MBTA.

SECTION 3
POTENTIAL IMPACT OF THE PROJECT ON THE DSF

ECOSYSTEM DESCRIPTION

The most consistent and characteristic feature of all known sites occupied by the DSF is the presence of fine, sandy soils, often with wholly or partly consolidated sand dunes. These soil types are generally classified as the Delhi series (primarily Delhi fine sand). Delhi series soils cover approximately 40 square miles in several irregular patches extending from the cities of Colton to Ontario and Chino in northwestern Riverside and southwestern San Bernardino Counties (U.S. Soil Conservation Service 1971, 1980). Accordingly, the DSF's historic range may have extended across this 40-square mile area, presumably in a sporadic distribution. Records of museum specimens of DSF, which extend from the eastern margin of the Delhi Sands formation in Colton to near its western limit in Mira Loma, lend support to this historic range assumption.

This region of Delhi series soils, also known as the Colton Dunes, is the largest inland cismontane sand dune formation in southern California. This dune formation has been defined as the Desert Sand-verbena series in Sawyer (1994). Some of the plant species present on the Colton Dunes include California buckwheat, California croton, deer weed (*Lotus scoparius*), and California evening primrose (*Oenothera californica*). The Colton Dunes habitat supports several plants and animals of limited distribution, including Delhi Sands metalmark butterfly (*Apodemia mormo* new subspecies), Delhi Sands Jerusalem cricket (*Stenopelmatus* new sp.), convergent apiocerid fly (*Apiocera convergens*), and Delhi Sands sand roach (*Arenivaga* new sp.), San Diego horned lizard (*Phrynosoma coronatum blainvillei)*, western burrowing owl (*Athene cunicularia hypergia*), Los Angeles pocket mouse (*Perognathus longimembris brevinasus*), and San Diego black-tailed jackrabbit (*Lepus californicus bennettii*).

Much of the Colton Dunes area has been used for agriculture, chiefly grapes and citrus, since the 1800's. More recently, a significant portion of the remaining area has been used for dairies, housing tracts, and commercial/industrial sites. According to the USFWS, the present distribution of the DSF is believed to represent only a small percentage of its former range (USFWS 1993). Habitat has been lost and fragmented due to urbanization, agricultural activities, sand mining activities, illegal dumping, off-road vehicles, and invasion of non-native plants (USFWS 1993, 1997). The majority of remaining sands with restoration potential are degraded to some degree.

As of spring 1997, the known distribution of the DSF was believed restricted to 12 extant populations encompassing approximately 450 acres of suitable habitat (USFWS 1997). According to the USFWS, there presently exists an estimated 1,200 acres of habitat that can support the species (USFWS 1997). The

USFWS currently estimates that approximately several hundred acres of additional land may be restorable to habitat suitable for the DSF (USFWS 1997).

LIFE HISTORY

The DSF undergoes a complete metamorphosis (egg, larva, pupa, and adult). The life span of this animal is unknown. Development to metamorphosis likely takes one year, but it is possible that the larval stage may last 2 years or longer, depending on availability of food, temperature, rainfall, and other environmental conditions. The egg, larva, and pupa stages of the DSF are spent underground. Only the brief adult stage is spent above ground. The adults emerge and become active in the late summer. Collection records for the DSF indicate a single annual flight period during August and early September when daytime temperatures exceed 27 degrees Celsius (80 degrees Fahrenheit) (Ballmer 1989). Lifespan in the adult form is not known (several days to several weeks has been postulated), but adults do not survive beyond the end of the flight period in September (Kiyani 1995).

Adult DSF are active during the warmest portions of the day during periods of direct sunlight, generally from 10 a.m. to 2 p.m. PDT (Ballmer in litt. August 24, 1991). The animals rarely fly during windy or breezy conditions, which typically occur in the afternoon. However, during these periods they have been located by disturbing the vegetation where they are perching (Ballmer ibid). Male DSF generally select sites with open sand allowing several feet of visibility from ground perches, while female DSF select buckwheat and telegraph weed cover (Kiyani 1996b).

Mating among members of this genus was described by Rogers and Mattoni (1993). After mating, the females lay their eggs (oviposit) in suitable sandy soil. Neither the typical number of eggs laid by females nor the potential range laid by females is currently known. Rogers and Mattoni (1993) described their observations of two male and two female captive DSF. The males lived for 3 days in captivity and would not eat. The females lived for 5 and 8 days, respectively. The females became active at 10 a.m. pacific daylight time (PDT) each day, regardless of light conditions and became quiescent about 5 p.m. PDT, except when ovipositing. One of the females was observed to oviposit at about 7:30 p.m. PDT. She laid a total of 40 eggs in the sand. The eggs were about 1.5 x 3 millimeters, almost kidney-shaped, and pure white with a slight pink iridescence.

Female DSF possess specialized egg-laying organs on the last segment on their abdomens. The eggs can be placed between 3 and 5 centimeters beneath the surface of the sand. This adaptation assures that the eggs are placed in a cooler and moister environment than the surface of the sand. Most oviposition takes place in the shade of shrubs, such as the telegraph weed (Rogers and Mattoni 1993). In the few observations of egg laying (ovipositing) by DSF, ovipositing took place within one foot of telegraph weed (Kiyani 1995). However, the required environmental factors which, when found together, constitute suitable ovipositing sites remain unknown.

It is unknown where the larval form lives below ground or what types of micro-environmental requirements the larval form may require. In captivity, larvae hatched from the eggs in 11 to 12 days (Rogers and Mattoni 1993). The larvae of the DSF and two other *Rhaphiomidas* species were held in captivity by Rogers and Mattoni (1993). All items of food, including synthetic diets that were offered to the animals, were rejected. Rogers and Mattoni (1993) reported that captive larvae refused to feed on small beetle larvae collected from the sand dunes, fruit fly larvae, or sand dune cockroach nymphs. None of the fly larvae became cannibalistic, even when starving. The larvae all died within fifteen days. It remains unclear as to whether the early stages of *Rhaphiomidas* are herbivores, detritivores, or carnivores. The larvae of the closely related genus *Apiocera* have been successfully raised on earthworms in the laboratory (Cazier 1982).

The DSF is a rapid flier and can hover like a hummingbird for nectar extraction. The species has been observed taking nectar and has not been seen to take other fluids. The nectaring events observed have been brief, on the order of 2-10 seconds, and have all been restricted to flowers of the California buckwheat (Kiyani 1997, USFWS 1997).

To date, little is known regarding predators of the DSF. The introduced Argentine ant (*Iriodomyrmex humilis*) has been observed to attack and kill a recently emerged adult DSF (R. Rogers, pers. obs. 1993). Rogers and Mattoni (1993) and Cazier (1985) reported that large asilid flies in the genera *Proctocanthus* and *Promachus* prey upon *Rhaphiomidas* flies. Other predators of the adult flies may include dragonflies and insectivorous birds. Predators of the early stages of the DSF are unknown, but may include ants, subterranean predatory insects, and reptiles.

HABITAT REQUIREMENTS, BEHAVIOR AND POPULATION DYNAMICS

Areas containing sandy substrates with a sparse cover of perennial shrubs and other vegetation constitute a primary habitat requirement for the DSF. Based on observations of several other members of this genus, optimal vegetative cover may be less than 50 percent, and may be in the range of 10-20 percent (USFWS 1997). DSF appear to avoid areas of dense (greater than 75 percent) vegetation cover (Kiyani 1996b).

The specific plant species and densities of such species required to create suitable DSF habitat are currently unknown (Kiyani 1996). Definitive associations of adults with specific plants have not been established. Typically, the most abundant native plant species found where the DSF has been found include California buckwheat, croton, and telegraph weed (Ballmer 1989). Additional native plants found commonly where the

DSF has been found include annual bursage, fiddleneck, vinegar weed (*Lessingia glandulifera*), and sapphire eriastrum (*Eriastrum sapphirinum*).

Invasive non-native vegetation severely degrades or eliminates the habitat of the DSF. Non-native plants of concern include Russian thistle, horehound (*Marribium vulqare*), mustard (*Brassica tournefortii*), cheese weed (*Malva parviflora*), and many species of introduced grasses such as ripgut brome and foxtail chess. These plants may alter the amount of soil moisture or make the substrate physically unsuitable for the survival of the DSF and other native subterranean invertebrates. The diversity and abundance of arthropods have been found to be significantly reduced or absent in coastal dune areas containing exotic plants versus areas with native vegetation (USFWS 1997).

Off-road vehicles (ORVs) are believed to have a negative impact on the DSF and the other plants and animals found in its habitat. (USFWS 1993). ORVs compact the soil, possibly crushing and killing subterranean forms of the species; flatten and destroy vegetation, thereby removing potential food and cover; and increase rates of erosion. The use of even low numbers of ORVs may disturb the feeding, breeding, or resting behavior of adult DSF (USFWS 1997).

Trampling, or disruption of the substrate, is a concern usually overlooked for dune systems. Trampling is deleterious because it destroys the cryptoflora crust, which is important to resisting invasive microorganisms and maintaining soil ecosystem integrity (USFWS 1997).

In addition to directly eliminating habitat, agricultural conversion and residential and commercial development often result in habitat fragmentation, which may negatively affect the dispersal of the DSF. Roads have been found to be a barrier to the movements of some butterflies, beetles, and other arthropods (USFWS 1997). USFWS personnel have reported that adult DSF have been observed to turn or reverse the direction of their flight upon encountering paved roadways. The extent to which paved roads actually present a barrier to DSF movement remains unknown, however. DSF have been reported to fly across construction sites, roads, desilting basins and the like (USFWS 1997).

The number of DSF observed in a population may fluctuate from day to day and from year to year at a given locality. Reliable estimates of population sizes for the DSF are lacking. At the San Bernardino County Hospital preserve, high and low population estimates ranged from 162-106 in 1994, 121-70 in 1995, 140-49 in 1996, and 98-35 in 1997 (Kiyani 1997). Kiyani (1996 a, b) notes a number of assumptions and uncertainties regarding population counts of the DSF, and thus these estimates are considered tentative. At another site in 1989, a direct count of 13 individuals was made within a half-hour over a 10-acre portion of a 150-acre site (USFWS 1997, Ballmer 1989).

DSF CONSERVATION EFFORTS

The USFWS finalized its Recovery Plan for the DSF in 1997 (USFWS 1997). The Plan describes the life history of the DSF, current knowledge about populations, threats to the species, and conservation measures to protect the species sufficiently so that it is downlisted to threatened.

Significantly, the Recovery Plan states that "the likelihood of extinction [of the DSF] remains high, unless habitat protection and captive breeding and release programs are initiated without delay." The USFWS considers the species as having a high threat and low recovery potential (USFWS 1997). The Recovery Plan has identified at least two high-priority actions to promote the recovery and conservation of the species: (1) a captive breeding program to help ensure against the potentially devastating effects of local extirpation at existing occupied sites, and (2) acquisitions of conservation habitat consistent with the Recovery Unit concept. The Recovery Plan defines three geographic areas as recovery units: the Colton, Jurupa, and Ontario Recovery Units. The Project Site lies within the Colton Recovery Unit. The Recovery Plan has a goal of eight protected populations in the three Recovery Units, with four of the populations in the Colton Recovery Unit. The Plan states that two of the protected populations in the Colton Unit should be north of I-10, and two south of I-10.

To date, no areas of critical habitat have been designated for the DSF.

The Recovery Plan has an objective of protecting approximately 350 to 360 acres of DSF habitat within Agua Mansa Enterprise Zone (AMEZ) for DSF conservation (USFWS 1996c, 1997). The Recovery Plan states that approximately 50 of these acres should be in the area of the intersection of Riverside Avenue and Jurupa Avenue. The Recovery Plan states that there is currently no data available to determine the acreage needed for a properly functioning DSF preserve and does not present a biological reason for a preserve size of 50 acres (USFWS 1997).

The Recovery Plan discusses the Agua Mansa Industrial Growth Association (AMIGA) Memorandum of Understanding (MOU), which was signed in 1996 and was originally proposed to serve as the basis for developing a regional HCP for the AMEZ. The AMIGA MOU covers approximately 10,800 acres of land within the AMEZ including roughly 4,000 acres of vacant land (USFWS 1996c). If completed, the AMIGA HCP would provide for approximately 350 acres of protected habitat for the conservation of DSF (USFWS 1996c).

The MOU calls for the AMIGA to make efforts to pursue the development and enactment of an HCP, if feasible, and for the USFWS to work with the AMIGA to that end. After pursuing the formation of an HCP to cover the entire AMEZ, the AMIGA has indicated that an HCP for the entire AMEZ is not feasible and will not be further pursued. The USFWS has indicated that it hopes the AMIGA will revisit the idea in the future.

The City of Colton has recently signed an MOU (Visy MOU) with the USFWS to explore the possibility of developing an HCP to cover approximately 240 acres for the Visy Paper Company project on land within the AMEZ. The Visy site is northeast of the project site in the city of Colton (Exhibit 5 Numbers 12, 13). The Visy MOU and resulting HCP would conserve approximately 160 acres within the 240-acre site for DSF conservation and allow the remainder to be developed. At this time, no HCP has been submitted or approved.

Currently, it is uncertain whether the AMIGA or Visy HCPs will be developed or implemented. Furthermore, there has been a notice filed with the USFWS by The Southwest Center For Biological Diversity and the Endangered Habitats League, pursuant to the Endangered Species Act, of an intent by these organizations to file a lawsuit over these MOUs. Such a lawsuit, if filed, may prevent completion and implementation of those HCPs under either MOU.

The City of Colton has established a preservation area of 7.5 acres of occupied habitat south of Interstate 10, near the Rialto/Colton border, just north of Santa Ana Avenue (Exhibit 5 Number 15). The conservation value of these 7.5 acres may be enhanced by the proposed dedication and enhancement of the Conservation Area by the Antonini Trust, which will enhance and maintain a contiguous area of additional habitat for DSF in the vicinity.

A DSF habitat restoration plan is being developed for the SCE parcels north and west of the Project Site (Exhibit 5 Numbers 14, 16). SCE and USFWS have been developing the plan, and implementation is expected to begin in the near future. This approximately 19-acre area is contiguous with the north edge of the Project Site. The conservation value of the SCE parcels may be enhanced by the proposed dedication and enhancement of the Conservation Area by the Antonini Trust, as these parcels are contiguous with the Conservation Area. The combined area of contiguous enhanced DSF habitat would be approximately 50 acres if the Proposed Action were to be adapted.

The Owl Company has agreed to set aside 6+ acres of an 11-acre site along Riverside Avenue as dedicated land for DSF conservation (Exhibit 5 Number 3). The remaining portion of the 11-acre site is planned to be developed for possible industrial development and secondary access to an adjoining developed site. This dedication agreement is part of the AMIGA MOU.

As part of the AMIGA MOU, Home Savings of America FSB has agreed to donate $450,000 for DSF habitat acquisition. According to the USFWS, the material terms of this agreement are now the subject of discussions between Home Savings' successor and the USFWS.

PROJECT SITE EXISTING CONDITIONS

Exhibit 7 illustrates the Project Site, depicting the parcels contemplated for industrial development and use and the Conservation Area to be dedicated for the recovery and conservation of the DSF.

A 1989 biological assessment of the Site prepared by Tierra Madre Consultants, Inc. noted that essentially the entire Site evidenced past human-induced disturbance. According to Tierra Madre, a citrus orchard area covered the Site and a windrow of eucalyptus trees lined the western boundary. As of 1989, Tierra Madre noted that virtually all native vegetation was absent from the Site and that domestic sheep grazing was occurring, or had been occurring on the Site recently. A vacant residence with several sheds and a block wall were located in the southern portion of the property. Illegal trash dumping was noted on the Site, particularly in the northern portion. Ballmer described the vegetation of the Site as consisting "mostly of introduced weeds such as *Avena barbata*, *Bromus diandrus*, and *Brassica geniculata*, but native species such as *Eriogonum fasciculatum*, *Croton californicum*, and *Heterotheca grandiflora* are also present in low density" (Ballmer 1989).

The majority of the 96-acre Site consists of the Delhi Sands soil formation (United States Department of Agriculture 1980) (see Exhibit 4). There are an estimated 20 acres of non-Delhi sand soil on the larger 87.5-acre parcel, leaving approximately 67 acres of Delhi Sands soil on the larger parcel. These acreage figures are based on published USDA soil maps, which are mapped at a large scale and thus represent approximations at the mapping scale of the Project Site. Although mapped as Delhi Sands soil, the 8.4-acre parcel does not appear to contain Delhi Sands soil as the parcel slopes down to the river plain and does not have the unconsolidated springy texture of Delhi Sands soil on the larger parcel. In any event, one to two acres of the native soil on the 8.4-acre parcel was removed by sand mining operations between the time of the USDA soil mapping and the purchase of the parcel by Antonini Trust. This results in at most 6 acres of Delhi Sands soil on the 8.4-acre parcel. Thus, there are an estimated 73 acres of Delhi Sands soil on the Project Site.

The topography of the Site consists of relatively level terrain with some rolling swales. Much of the Site was disced for fuel reduction in April 1997. Areas adjacent to the Site support developed and undeveloped land. A few eroded drainage channels interrupt the otherwise relatively level terrain of the Site.

The vegetation of the Site consists generally of a ruderal (weedy) mixture of native and non-native shrubs, forbs, and grasses that are good colonizers of disturbed areas. Vegetation cover on the Site varies from 100 percent to less than 5 percent; most of the site supports cover exceeding 90 percent. Overall the herbaceous/grass layer averages about 80 percent cover. Most of the Site is dominated by the non-native ripgut brome and mustard and the native annual bur-sage and telegraph weed. Other generally distributed common species are the non-native grasses, wild oats, ripgut brome, and foxtail chess. In the small open sandy areas and a few other small patches not recently disced, a few additional native species are prevalent, including California croton, tarweed, and fiddleneck. Castorbean and annual sunflower are common in the drainage ditch bordering Agua Mansa Road. The slope along the upper one-half of the Site's southeastern border is covered with a dense growth of non-native grasses, among which occur sparsely most of the other plant species mentioned above, as well as brittlebush (*Encelia farinosa*), valley cholla (*Opuntia parryi*), calabazilla (*Cucurbita foetidissima*), wild cucumber (*Marah macrocarpus*), jimson weed (*Datura wrightii*), and a few individuals of California buckwheat.

Native telegraph weed is common in places. In a few sparsely vegetated sandy unpaved roadways and in small patches of relatively open sand distributed occasionally to frequently within the otherwise typically dense vegetation cover, a few additional native species are prevalent, including California croton, tarweed and fiddleneck. Vegetation of this particular character and density is largely concentrated in small patches distributed across a 20- to 30-acre area in the northwestern portion of the Project Site.

Portions of the Site have been disturbed by past activities including citrus farming, grazing, unauthorized ORV use, weed abatement discing for fuel reduction, and illicit trash dumping.

Approximately 2,700 linear feet of underground water pipelines were constructed on the site between June 1996 and February 1997. The construction zone for trenching was 25 to 30 feet wide, with a wider area of soil excavated to provide stable banks surrounding the trenching zone. In some locations, the cutbanks are approximately 100 feet wide. The backfill material over the pipelines was compacted, and currently forms unpaved roadways on the site.

Historically, the Project Site has not been identified as containing a DSF population. In 1989, Greg Ballmer and two other observers investigated the Site on two days during the adult flight period; no flies were observed and Ballmer did not believe that the Site was currently occupied given the degraded and disturbed nature of the Site (Ballmer 1989). The USFWS made similar observations regarding the lack of current suitable habitat on a portion of the Site that was surveyed in 1994 (USFWS 1994a.)

DSF have been observed on lands near the Site. DSF have been observed in the SCE property near Riverside Avenue (Exhibit 5 Number 14, 16) (Ballmer 1989, Riggan 1996). There is an established population on the SCE property on either side of Riverside Avenue (Gould pers. comm.). This area is immediately adjacent to the proposed Conservation Area. Another established population is located approximately 3,000 feet northeast of the Project Site (ENSR 1997). Other sites of reported DSF occurrences within 2 miles of the Project Site are shown in Table 1 and Exhibit 5 and are discussed below.

FOCUSED SURVEY METHODOLOGY AND FINDINGS

As noted previously, although no DSF were observed during focused surveys conducted during 1995, 1996, and 1997, USFWS requested additional focused surveys for DSF in 1998. During the 1998 surveys there were 4 observations of DSF on a single day of the surveys. No DSF were observed mating, ovipositing, or feeding. The observations indicate a minimum of 3 individual DSF were present on the site on the day the observations were made: 2 males, and 1 female.

MBA conducted focused surveys for the DSF to determine the presence or absence of this species on the Site in 1995, 1996, and 1997. These focused surveys were conducted in accordance with the field methodologies of the USFWS' recommended protocol, which recommends, inter alia, that two visits per week for the typical 4-to-6 week flight period of the DSF be conducted during appropriate weather conditions (USFWS 1995). However, surveys in 1996 did not commence until the third week after the first sightings of a DSF were made at the County Hospital Site, so the 1996 surveys started later than that recommended by the USFWS.

No DSF were observed on the Project Site during any of the 1995-97 surveys. Over 216 hours of surveys were conducted during appropriate survey periods and under weather conditions suitable for observation of DSF by trained biologists with experience with DSF during the 1995-97 surveys.

1995 Focused Surveys

All areas of potential DSF habitat were surveyed 4 times per week for 4 weeks for a total of 16 visits, in order to obtain total coverage of the Site. During 1995, surveys commenced within 9 days of the first reported observation of DSF and were conducted on August 18, 22, 24, 25, 27, 30, 31, and September 1, 5, 6, 7, 8, 11, 12, 13, and 14. Weather conditions during the 1995 surveys were conducive to high levels of invertebrate activity. Temperatures ranged from 26 to 46 degrees Celsius (79 to 115 Fahrenheit). Wind speed ranged from 0 to 8 kilometers per hour (0 to 5 miles per hour). Surveys were conducted between 8:00 a.m. and 3:30 p.m. by MBA biologist Amy B. Dickerson. Approximately 104 person-hours of surveys were conducted in 1995.

During the 1995 surveys, potential DSF habitat was walked in search of patrolling males and resting flies of both sexes. Air space above flowering plants was watched carefully for flying insects. Patches of open sand, flowers, and plant stems were examined for resting flies. Flowers were also examined for feeding flies. All insect taxa encountered at flowers were noted (to family, or if possible to genus). Insects unidentifiable visually were captured (when possible) in an insect net for closer examination.

No DSF were observed on the Project Site during the 1995 surveys.

1996 Focused Surveys

During the 1996 surveys the Site was surveyed 2 times per week for 4 weeks for a total of 8 visits. The surveys were conducted on August 24, 25, 29, and 31, and September 1, 8, 9, and 12, 1996. The entire Site was covered on foot between the hours of 9 a.m. and 4 p.m. Weather conditions during the surveys were conducive to high levels of invertebrate activity. Temperatures ranged from 29 to 39 degrees Celsius (84 to 102 degrees Fahrenheit). Wind speed ranged generally from 0 to 17 km/hr (0 to 10 mi./hr). Surveys were conducted by Larry Munsey, an entomologist having specialized experience with the DSF. Approximately 48 person-hours of surveys were conducted in 1996.

No DSF were observed on the Project Site during the 1996 surveys.

1997 Focused Surveys

During the 1997 surveys, the Site was surveyed 2 times per week for 7 weeks for a total of 14 visits. The surveys commenced within 4 days of the first reported sightings of DSF in 1997, and were conducted on August 10, 11, 16, 17, 22, 25, 29, and 30, and September 5, 8, 12, 16, 19, and 20, 1997. The entire Site was covered on foot between the hours of 10 a.m. and 3 p.m. Weather conditions during the surveys were conducive to high levels of invertebrate activity. Temperatures ranged from 24 to 40 degrees Celsius (75 to 104 degrees Fahrenheit). Wind speed ranged generally from 0 to 8 km/hr (0 to 5 mi./hr) with occasional gusts to 17 km/hr (10 mi./hr); skies were generally clear, with a few exceptions when overcast conditions prevailed. Surveys were conducted by Larry Munsey. Approximately 64 person-hours of surveys were conducted in 1997.

No DSF were observed on the Project Site during the 1997 surveys.

1998 Focused Surveys

During the 1998 surveys, the Site was surveyed 2 times per week for 5 weeks, between the hours of 1000 and 1400, commencing 17 August 1998 and concluding 20 September 1998. The surveys were conducted in accordance with USFWS interim general survey guidelines (USFWS 1996b), except for two special modifications pursuant to prior agreement with the USFWS: (1) the survey area was limited to 50 acres, selected in cooperation with USFWS biologists to include all the small patches and other areas containing vegetation of a composition and density associated with potential use by DSF within the site's total 96 acres; (2) the duration of the survey period was 5 (rather than 7) weeks. The survey area included the SCE easement. Surveys were performed by Larry Munsey.

Surveys were conducted on foot, generally following a transect pattern that reflected the location of areas containing patches, regardless of their size, of relatively open, sparsely vegetated Delhi Sands soils. These areas were determined by an on-the-ground habitat assessment conducted by Mr. Munsey in cooperation with USFWS personnel. The areas selected for surveying were selected to encompass all areas of sparsely vegetated sand that could be arguably used by opportunistic DSF. Weather conditions during the surveys were generally conducive to high levels of invertebrate activity. Temperatures typically ranged between 26 and 40 °C (78-104 °F). On a few occasions temperatures during the first one to two hours of the survey period were lower, ranging in the low to mid-20°s C (70°s F). Only in one instance did the low temperature fail to exceed 27 °C (80 °F) by noon (mid-survey), or during any time of the survey-day. Wind speed ranged generally from 0 to 8 km/hr (0 to 5 mi./hr) with occasional gust to 25 km/hr (15 mi./hr). Skies were generally clear, with some exceptions when overcast conditions prevailed. Approximately 40 person-hours of surveys were conducted during the 1998 surveys.

There were four (4) DSF observations on the Project Site during one of the survey-days in 1998. Individual DSF detection's were made on four different occasions between 1145 and 1215, August 27, 1998, each sighting was separated by short intervals of less than a minute to several minutes. Three of the sightings were of a male, and one of a female. Each of the male sightings involved continuous observation for a half-minute to a few minutes in duration. In all instances, these individuals were engaged in "cruising" flight behavior, sometimes coming to brief rest on the ground or a low-lying plant. The female flew from vegetation and was observed for only a few seconds while in flight.

Of the three sightings involving male DSF, the first two sightings conclusively represent separate individuals, due to distinct differences in size and morphology of the DSF. The second and third male sightings suggested the strong possibility of being the same individual, because the sightings occurred quite closely in time and space, and the DSF were indistinguishable in appearance.

The DSF sightings occurred in a sandy unpaved roadway located within the northwestern portion of the Project Site (Exhibit 6). This unpaved roadway lies perpendicular to the site's western border from which it extends eastward for a few hundred meters across the site. All sightings were made within an approximately 50-m (150 feet) radius near the boundary of the property at Industrial Way. The sightings were within the proposed Conservation Area.

The observations suggest that three (3) DSF were present on the Site on August 27, 1998.

INTERPRETATION OF SURVEY FINDINGS

Prior to 1998, focused surveys of approximately 216 hours conducted over three consecutive years (1995, 1996 and 1997) indicated that DSF did not occur on the Project Site. These focused surveys were conducted by biologists familiar with the DSF and conducted according to the scientific methodologies of the recommended protocols, and did not find any DSF on the Site. Although the surveys conducted on the Site in 1996 did not commence at the very outset of the 1996 DSF flight season, MBA believes the survey results for 1996 are reliable because such surveys were conducted during the normal DSF flight season as noted in USFWS protocol, DSF were noted as late as September 2 on nearby properties (Olsen 1996) and the surveys were carried out in accordance with the field methods called for in the USFWS protocol by an entomologist of considerable experience. The 1996 data supports the data from surveys in 1995 and 1997 and the surveys conducted by Ballmer in 1989 during which no DSF were observed (Ballmer 1989). Additionally, surveys by USFWS on a portion of the Site observed no DSF and concluded that the area surveyed was of low suitability for DSF due to the high level of disturbance on the property (USFWS 1994a).

Habitat surveys indicate that the Site generally contains disturbed, degraded habitat which is unsuitable for DSF. Currently most of the Site supports vegetative cover exceeding 90 percent, with percent cover varying from 100 percent to less than 5 percent. Overall, the herbaceous/grass layer averages about 80 percent cover on the Site. As noted previously, DSF appear to avoid areas of dense vegetation cover (greater than 75 percent), with males selecting areas of open sand as perch sites during mating season, and females using buckwheat and telegraph weed for perches and ovipositing immediately adjacent to telegraph weed (Kiyani 1995, 1996a, b, 1997). Although the entire 96-acre Site contains approximately 73 acres of Delhi Sands soils, the vegetation community on the Site is generally unsuitable for DSF. The plant community on Site is dominated by non-native species, has a dense stand structure, and contains little bare ground. Plant communities such as these are considered unsuitable habitat for DSF (USFWS 1997, Ballmer 1989). The data from the 1995-97 focused surveys and the habitat assessments were mutually supportive and reinforcing. The data from the 1995-97 focused surveys supported the conclusion that DSF did not occur on the Site.

It could be argued that data from the 1998 surveys indicate that a small portion of the Site appears occupied by DSF. This small area lies within the proposed Conservation Area along the open sandy unpaved roadway area formed by maintenance activities for an existing underground water line. As noted previously, the unpaved roadway and associated cutbanks were disturbed by construction of underground water pipelines between June 1996 and February 1997. The unpaved roadway area contains open sand and is sparsely vegetated with scattered croton and telegraph weed. This area is within the proposed Conservation Area. This Area is approximately 100 feet wide and 400 feet long and encompasses approximately one acre.

Although the Site generally does not contain suitable habitat for DSF, the Site contains Delhi Sands soil, the fundamental component of DSF habitat. A few of the plant species associated with DSF habitat are scattered sparsely across the Site, but the Site is currently dominated by other plant species, particularly non-natives. Thus, a portion of the Site appears to contain potentially restorable DSF habitat. Removal of non-native plants, opening areas of bare soils, and planting of key native plant species would be basic to restoring DSF habitat on the Site.

As noted previously, there are sparsely vegetated sandy unpaved roadways and small patches of relatively open sand distributed occasionally to frequently in the 20- to 30-acre area in the northwestern portion of the Project Site. These more open areas are within a matrix of otherwise typically dense vegetation cover. Within the scattered open patches a few native species are prevalent, including California croton, telegraph weed, tarweed, and fiddleneck. The USFWS has indicated that the Site provides suitable habitat for the DSF, especially within the Conservation Area.

In general, the ESA does not regulate potentially restorable or unoccupied habitat on private property. For the most part, to qualify as a take under the ESA, the loss of suitable habitat must directly and imminently lead to the injury or death of one or more specific members of the listed species. Data from focused surveys suggest that a relatively small but unquantifiable number of DSF may be killed or injured by the Proposed Action during the term of the Permits.

KNOWN LOCATIONS AND OBSERVATIONS OF DSF IN THE PROJECT SITE VICINITY

The USFWS DSF Recovery Plan states that there are 12 known locations inhabited by DSF. These sites and their population numbers are not described in detail in the Plan (USFWS 1997).

There are nine locations of reported observations of DSF within 2 miles of the Project Site. Reported sightings include single observations of DSF, which may be transient individuals, and multiple observations, which may indicate established populations. Reported observations in the vicinity of the Project Site as of DSF survey year 1997 are shown in Table 1, mapped in Exhibit 5 and described below.

TABLE 1

DELHI SANDS FLOWER-LOVING FLY SURVEY SITES IN THE PROJECT SITE VICINITY AS KNOWN IN 1997

Map #	Property Name	Acreage	DSF Observed	Established Population	Reference
1	Angelus Block	96	No	No	MBA 1995, 1996, 1997 Ballmer 1989
2	Owl Company Mine Site	217	No	No	Riggan 1996
3	Owl Company Access Site	11	Yes, 2	Unknown	Riggan 1996
4	Inland Empire Composting	107	No	No	FH&A 1994
5	Trism/Rialto Land Co./Singletary	10	Yes, 2	Unknown	USFWS 1996a
6	Agua Mansa Industrial Center	250	Yes, 3	Unknown	Thomas Olsen 1996
7	Hospital Mitigation Site	9	Yes, many	Yes	Kiyani 1996
8	Santa Fe Buckwheat Parcel	17	Yes, 1 or 2	Unknown	Tierra Madre 1997
9	Santa Fe Sycamore North	19	Yes, many	Yes	Tierra Madre 1997
10	Santa Fe Sycamore South	5	No	No	Tierra Madre 1997
11	Colton/San Bernardino Water Treatment	35	No	No	Thomas Olsen 1997
12	Visy Proposed Project Site	80	Yes, Multiple	Unknown	Woulfe pers. comm.
13	Visy Proposed Conservation Area	160	Yes, many	Yes	ENSR 1997
14	SCE Area #1	9.4	Yes, multiple	Yes	Riggan 1996
15	Colton Transmission Line Mitigation Site	7.5	Yes	Yes	ENSR 1995
16	SCE Area 2	9.6	Yes, 4	Unknown	Ballmer 1989

Focused surveys were conducted during the 1994 and the 1996 DSF flight seasons on the Owl Company Access site (Exhibit 5 Number 3). Three surveys were conducted in 1994. No DSF were observed during the 1994 surveys. Five surveys were conducted in 1996. Two DSF were observed on the Owl Company Access Site during 1996 surveys, and it is not known whether there is an established population at the site (Riggan 1996). The majority of the approximately 11-acre site is composed of Delhi Sands soil. The northern portion of the site is composed of somewhat open dune-like vegetation, while the southern portion is dominated by ruderal vegetation. Six acres of this 11-acre site are to be set aside for DSF conservation, and the remaining acreage of the access site, as well as the 217-acre Owl mine site (Exhibit 5 Number 2), are to be developed (USFWS 1996c).

The habitats on the 107-acre Inland Empire Composting site (Exhibit 5 Number 4) were surveyed in September 1994 to assess suitability for DSF. The site contains riverine deposit soils, does not contain

Delhi Sands soils, and is considered unsuitable for DSF (FH&A 1994). No DSF were observed. Focused surveys for DSF were not conducted.

Six focused surveys for DSF were performed by USFWS personnel and consultants in 1996 on the Trism/Rialto/Singletary property (Exhibit 5 Number 5). A minimum of two DSF were observed on the Trism/Rialto /Singletary property in 1996, it is not known whether there is an established population at the site (USFWS 1996a). The Trism/Rialto/Singletary property is currently undeveloped and contains Delhi Sands soils and some native plants. The USFWS considers the Trism property a potential DSF movement corridor and potentially a breeding site in good years (USFWS 1996a). The site is approximately 9.75 acres in size.

The Agua Mansa Industrial Center site (Exhibit 5 Number 6) was surveyed 12 times during the 1996 DSF flight season. Three DSF were observed in 1996 (Thomas Olsen 1996), it is not known whether an established population exists on the site. The Agua Mansa Industrial Center site is approximately 250 acres in size. Most of the site was disced in June 1996 prior to the surveys. Vegetation on the site before discing had been dominated by non-native grasses. Some of all of the site has been provided Incidental Take authorization by USFWS. The terms of this arrangement are currently the subject of discussions between the USFWS and the property owner(s).

There is a small established population, estimated to be between 35-162 individuals (Kiyani 1987), at the San Bernardino Hospital Mitigation site (Exhibit 5 Number 7). The site has been the location of behavioral studies of DSF for several years (Kiyani 1995, 1996 a, b, 1997). The site contains a stand of native vegetation and open unvegetated sand (Kiyani 1996). Ten acres have been preserved as DSF habitat (USFWS 1997).

DSF have been observed on two parcels of land owned by Santa Fe Pacific Pipeline Partners LP: the 17-acre Buckwheat parcel and the 19-acre Sycamore North parcel (Tierra Madre 1997) (Exhibit 5 Numbers 8, 9). Fourteen surveys were conducted in 1997 on each parcel. Only two DSF were observed on the Buckwheat parcel, and it is not known whether there is an established population or whether these were transient individuals. There have been numerous DSF observed on the Sycamore North parcel including pupal cases and an emerging male indicating there is an established DSF population at this site (Tierra Madre 1997). The Sycamore North parcel is considered high quality occupied DSF habitat (Tierra Madre 1997). A third parcel owned by Santa Fe Pacific Pipeline Partners LP, the 5-acre Sycamore South parcel (Exhibit 5 Number 10), was surveyed along with the other Santa Fe parcels. The Sycamore South parcel has been graded, contains no suitable DSF habitat, and no DSF were observed.

The Colton/San Bernardino Water Treatment site (Exhibit 5 Number 11) does not contain Delhi Sands soil (Olsen 1997). Thus, it was determined that the site does not contain DSF habitat (Olsen 1997). Focused surveys for DSF were not conducted.

The Visy site occupies approximately 240 acres and is divided into an 80-acre project site and a 160-acre conservation area (Exhibit 5 Numbers 12, 13). Six surveys for DSF were conducted in 1997, with results consistent with data collected in 1996. There have been DSF observed at the proposed Visy 80-acre project site, (Woulfe pers. comm.) (Exhibit 5 Number 12). There have been numerous observations of DSF in the proposed 160-acre conservation area (Exhibit 5 Number 13) associated with the proposed Visy project (ENSR 1997). There appears to be an established population in the proposed conservation area (ENSR 1997).

DSF were observed on the SCE Area #1 (Exhibit 5 Number 14) in 1994 by USFWS biologist Jeff Newman (Riggan 1996). Several DSF were observed and used as a check on DSF activity during the 1994 surveys of the Owl Company Access site.

The Colton Transmission Line Mitigation Site (Exhibit 5 Number 15) has been reported as being occupied by DSF (ENSR 1995). Details of site surveys, and DSF observations are not readily available.

The SCE Area 2 (Exhibit 5 Number 16) was surveyed on three days in 1989. Four DSF were observed (Ballmer 1989).

OTHER SPECIAL STATUS SPECIES WITH POTENTIAL TO OCCUR ONSITE

A review of recent listings under the FESA and data from the California Natural Diversity Database (CNDDB) for the San Bernardino South and Fontana USGS topographic quad maps indicate thirty special status species are known to occur within the region of the Site (CDFG 1997). An assessment of the species' respective habitat preferences, conditions on Site, and discussions with USFWS show that twenty of these potentially occur on the Site, as the Site contains appropriate conditions and is in the geographic range of the species. These are briefly described below.

Special status species are native species that have been accorded special legal or management protection because of concern for their continued existence. There are several categories of protection at both federal and state levels, depending on the magnitude of threat to continued existence and existing knowledge of population levels.

Sources used to determine potential occurrence of special status species include: U.S. Fish and Wildlife Service (USFWS 1993; 1994b, 1996d), California Department of Fish and Game (CDFG 1996a,b, 1997, 1998a, b), California Native Plant Society (Skinner and Pavlik 1994) California Wildlife Habitat Relationships Database System (CDFG 1991), Remsen (1978), and Williams (1986).

Plants

The Santa Ana River woollystar (*Eriastrum densifolium ssp. sanctorum*) is listed as endangered under federal and state law. It is an erect, many branched, bright blue flowered, perennial herb. It is found within the Santa Ana River drainage on sandy soils of river floodplains and terraced alluvial deposits. The woollystar has not been observed on the Site and is not expected to occur, as suitable habitat is not present.

Wildlife

The San Diego horned lizard (*Phrynosoma coronatum blainvillei*) is a federal species of concern and a California species of special concern. It is a small, spiny, somewhat rounded lizard that occurs primarily in open or sparse coastal sage scrub and chaparral communities. This species prefers loose friable soil for burrowing. Three factors have contributed to its decline: loss of habitat, overcollecting, and the introduction of exotic ants. In some places, especially adjacent to urban areas, the introduced ants have displaced the native species upon which the lizard feeds. The horned lizard has not been observed on the Site, and is not expected to occur on the Site, as their preferred open habitat is not present.

The silvery legless lizard (*Anniella pulchra pulchra*) is a CDFG species of special concern. It is a small, secretive, snake-like lizard that lives and forages in leaf litter, under debris, or within sandy soil (Stebbins 1985). It occurs in a variety of habitats, including sandy washes, sandy soil, coastal scrub habitats, and woodlands. The silvery legless lizard preys on insect larvae, small adult insects, and spiders (CDFG 1991). This species may occur on the Site as the Site is in the geographic range of the lizard and sandy soil is present.

The northern red diamond rattlesnake (*Crotalus ruber ruber*) is a CDFG species of special concern. This subspecies is most commonly encountered in open scrub habitats such as coastal sage scrub, but it also inhabits grasslands, dry washes, chaparral, and woodlands. The northern red diamond rattlesnake ranges from southern San Bernardino County, south into Baja California, and from sea level to around 5,000 feet (Stebbins 1985). This species may occur on the Site as low value habitat is present.

The white-tailed kite (*Elanus leucurus*) is a fully protected species in California. It feeds on rodents (especially voles) and large insects that it hunts by hovering over suitable habitat. It forages over open grassland and nests in trees in a variety of habitats. Winter roosts usually occur in oaks and other large trees associated with streams, rivers, and marshlands. This species may occasionally forage over the Site; however, suitable nesting habitat is absent.

The golden eagle (*Aquila chrysaetos*) is both fully protected and a CDFG species of special concern, and is protected by a 1963 amendment to the Bald Eagle Act of 1943. This bird is an uncommon-to-rare permanent resident in open habitats throughout California. It nests in high trees and on rock faces of cliffs, and forages over plains and in open country. This species has been observed flying over the Site; no suitable nesting habitat is present.

The sharp-shinned hawk (*Accipiter striatus*) and Cooper's hawk (*Accipiter cooperii*) both are CDFG species of special concern. Both species breed in woodlands and forests. Cooper's hawk is both a resident and winter visitor in southern California; the sharp-shinned hawk is only a winter visitor. During winter months these two species forage in urban areas. Both may occasionally forage over the Site, there is no nesting habitat on the Site.

The prairie falcon (*Falco mexicanus*) is a CDFG species of special concern. It requires cliffs or rocky outcrops for nesting and dry open areas for foraging. Its prey includes small mammals, small birds, and reptiles. This species may occasionally use the Site for winter foraging; no suitable breeding or nesting habitat is present.

Other raptors that are uncommon to rare in the region may forage on the Site during migration. These include the ferruginous hawk (*Buteo regalis*), northern harrier (*Circus cyaneus*), and merlin (*Falco columbarius*), all CDFG species of special concern, and Swainson's hawk (*Buteo swainsoni*), a state-threatened species.

The western burrowing owl (*Athene cunicularia hypergia*) is a CDFG species of special concern. Formerly common throughout California, its decline was noticeable as early as the 1940s. The burrowing owl lives in the abandoned burrows of ground squirrels and other burrowing animals, modifying the burrows to suit its needs by digging. It is one of the few owl species often seen during the day, perched on fenceposts or at the entrance to burrows. Although the sandy soil conditions of the Site would limit the size and longevity of burrows, a burrowing owl was observed on site near an abandoned, exposed concrete pipe.

The California horned lark (*Eremophila alpestris actia*) is a CDFG species of special concern. This is the southern and central California resident subspecies of the widespread horned lark. California horned larks are found in sparse grasslands, some agricultural areas, and open brush with extensive bare ground. Horned larks nest on the ground in grasslands. Potential California horned lark breeding habitat is present on the Site.

The loggerhead shrike (*Lanius ludovicianus*) is a CDFG species of special concern. This bird prefers open habitats with scattered shrubs, trees, posts, fences, or other perches. It nests in trees or shrubs adjacent to open areas. It preys on large insects such as grasshoppers, and will also take small mammals, birds, and reptiles. This species occurs on the Site.

The California mastiff bat (*Eumops perotis californicus*), pallid bat (*Antrozous pallidus*), and pale big-eared bat (*Plecotus townsendii pallescens*) are CDFG species of special concern. These species require rocky areas, abandoned mines or buildings, or other such habitat for roosting. Suitable roosting habitat for these species does not occur on the Site, but they may forage over the Site.

The San Bernardino kangaroo rat (*Dipodomys merriami parvus)* (SBKR) is listed as endangered under the ESA. The historical range of the SBKR extends from the San Bernardino Valley in San Bernardino County to the Menifee Valley in Riverside County (USFWS 1998). The SBKR is now primarily associated with a variety of sage scrub vegetation, where the common elements are the presence of sandy soils and relatively open vegetation structure (USFWS 1998). Where the SBKR occurs in alluvial scrub, the SBKR reaches its highest densities in early and intermediate seral stages (USFWS 1998). Conversations with USFWS staff indicate that SBKR may have historically occurred on the Project Site, and USFWS requested that surveys be conducted for SBKR.

Focused surveys for SBKR were conducted from November 18 to 22, 1998. A total of 1,240 trap nights were conducted following USFWS protocols by a biologist permitted to conduct SBKR surveys. Traps were placed in those areas that had the greatest likelihood of capturing SBKR based on habitat, soil conditions, and evidence of rodent activity. No SBKR or other kangaroo rats were captured or observed. It is concluded that the SBKR does not occur on the project site.

The Los Angeles pocket mouse (*Perognathus longimembris brevinasus*) is listed as a species of concern by the federal government and a species of special concern by CDFG. The pocket mouse occurs in grasslands and coastal sage habitats within the Los Angeles basin from Burbank and San Fernando to San Bernardino South to Cabazon and Hemet. The Los Angeles pocket mouse has been reported in the region (Tierra Madre 1997). The Los Angeles pocket mouse occurs on Site. Los Angeles pocket mice were captured during the surveys conducted for SBKR.

The San Diego black-tailed jackrabbit (*Lepus californicus bennettii*) is a CDFG species of special concern. Its range includes grasslands, coastal sage scrub, and chaparral in coastal regions of California from Ventura County to northern Baja California. The black-tailed jackrabbit is most active at dawn and dusk and feeds on green vegetation. This species may occur on the Site.

IMPACTS TO THE DSF THAT MAY RESULT FROM THE PROPOSED ACTION

Although it is impossible to project with any meaningful degree of accuracy, it appears most likely that no more than ten (10) DSF may be killed or injured by the Proposed Action. Regardless of the actual number, however the protection in perpetuity of approximately 30.5 acres of DSF habitat is expected to provide a net-benefit to conservation of DSF on the Site as explained below.

The development of the Site will result in the loss of approximately 43 acres of potentially restorable DSF habitat of which it can be argued that one acre appears occupied by DSF. As noted, a small portion of the Site within the proposed Conservation Area appears occupied by DSF. This roadway area is approximately one acre in size. The entire Project Site contains approximately 96 acres in two parcels. The smaller 8.4-acre parcel is not currently planned for development. The larger 87.5-acre parcel has been subdivided and is entitled for development. There are an estimated 20 acres of non-Delhi Sand soils on the larger parcel, leaving approximately 67 acres of Delhi Sands soil as potentially restorable DSF habitat on the larger parcel. These acreage figures are based on published USDA soil maps, which are mapped at a large scale and thus represent approximations at the mapping scale of the Project Site. Although mapped as Delhi Sands soil, the 8.4-acre parcel does not appear to contain Delhi Sands soil as the parcel slopes the river plain and does not have the unconsolidated springy texture of Delhi Sands soil on the larger parcel. In any event, one to two acres of the native soil on the 8.4-acre parcel was removed by the adjacent landfill operation between the time of the USDA soil mapping and the purchase of the Site by the Antonini Trust. This results in at most 6 acres of Delhi Sands soil on the 8.4-acre parcel. The Conservation Area will consist of 30.5 acres; thus, up to approximately 43 acres of unoccupied but potentially restorable DSF habitat could be affected by the proposed development.

The Conservation Area includes the locations where DSF were observed in 1998. The observations were made in an area that was excavated in 1997/98 for construction of an underground water pipeline. The DSF observation locations lie within an easement for an existing underground water line. These locations are included within the Conservation Area even though the easement will be subject to periodic soil and substrate disturbance in the future, as the water line must be accessed from time to time for periodic maintenance by the City of Rialto, and/or the West San Bernardino County Water District. The open, sandy, sparsely vegetated condition where the DSF were observed is likely an artifact of the construction of the pipeline. The open vegetation is strongly associated with the easement and the adjoining cutbanks, while the immediately surrounding vegetation (outside the obvious construction area) is much denser and dominated by nonnative species. Any DSF that may reside within the easement would be potentially injured or killed during periodic or emergency repair activities. Moreover, as active water lines already exist in this area, any DSF in this area could be injured or killed as the result of uncontrollable breaks or leaks in this water system which in turn could lead to a consequent change in soil conditions. Moreover, neither the City of Rialto, nor the West San Bernardino County Water District are receiving incidental take authority by virtue of the Applicants' Section 10(a) permit. Any of the City of Rialto's, or the West San Bernardino County Water District's activities that may result in incidental take will require a separate take permit for the agency responsible for the take.

There will be no storage of any material in the Conservation Area. Outdoor storage of finished concrete block and concrete paver in the SCE easement outside the Conservation Area is not expected to impact DSF or the Conservation Area. The concrete block and concrete paver are solid and composed of inert concrete and rock. There will be no storage of toxic or hazardous material in the outdoor storage area.

The proposed block plant, paver plant and E-Z Mix East Complex will comply with all air and water quality regulations. The three facilities will receive Portland cement binders and natural aggregate materials that consist of sands and gravels. Aggregates will be received in a moist state and transferred to storage without visible dust emissions. All transfer of dry materials during processing will be done with equipment vented through air pollution equipment approved by the Air Quality Management District (AQMD). The facilities will employ bag houses on the cement processing silos to control dust emissions. The bag house systems will employ mechanical gauges to indicate static pressure differential cross the bags, and will be maintained on a regular basis. Any emissions from the facilities will meet stringent air quality regulations. For these reasons emissions from the facilities are not expected to affect DSF or soils or habitat in the Conservation Area. Currently there are ongoing heavy industrial uses in the area of the Project Site that produce various emissions. These uses include cement production, mining and landfill operations.

Nighttime lighting in those lots near the Conservation Area will be directed away from the Conservation Area in a manner to avoid potential impacts on DSF.

A stormwater drainage system will be constructed for the Project Site that will convey water downhill to the south away from the Conservation Area in the northern end of the Site. Thus, no indirect effects to the Conservation Area are anticipated from stormwater. Accidental spills from facilities constructed on the Project Site are likewise not expected to affect the Conservation Area, as spilled material would be handled by established spill containment procedures approved by regulatory agencies, and spilled material would be expected to flow downhill away from the Conservation Area.

SCE activities within SCE's non-exclusive electric transmission easement within the Conservation Area are not expected to impact DSF or DSF habitat. As previously noted, SCE uses an existing dirt roadway in the proposed Conservation Area to access transmission towers that are outside of and to the west of the proposed Conservation Area in order to conduct periodic inspection and maintenance of these towers and to wash transmission tower insulators. The dirt road is approximately 16 feet wide. Insulator washing is done approximately every 6 weeks using pressurized water. The washing occurs outside the Conservation Area. Thus, SCE maintenance activities are not expected to impact DSF or habitat in the Conservation Area.

SCE has adopted an endangered species sensitivity training program for its employees, called the Endangered Species Alert Program (ESAP). Through the ESAP, SCE employees receive endangered species sensitivity training and are provided a manual identifying SCE transmission areas which contain or are within one mile of locations of endangered species. The ESAP contains procedures to follow in DSF sensitive areas such as the proposed Conservation Area. The ESAP covers topics such as appropriate general activity precautions, appropriate operating procedures in emergencies, and appropriate timing of activities in DSF sensitive areas.

Additionally, SCE is preparing a formal multi-species Habitat Conservation Plan to govern SCE's activities within electrical transmission line easement areas that contain listed species including the DSF. This additional program will be reviewed by USFWS, and when adopted will provide a further measure of protection for DSF from SCE activities within the Conservation Area. Moreover, SCE is not receiving incidental take authority by virtue of the Applicants Section 10(a) permit. Any of SCE's activities that may result in incidental take will require SCE obtain a separate take permit.

Following initial discussions with USFWS, the Conservation Area was redesigned from the original elongated area on the north and east of the Site to a more square-shaped 13.4-acre area in the northwest section of the Site. The redesign of the Conservation Area was done to reduce edge effects by providing a roughly square-shaped area rather than the long narrow area originally planned. Reshaping the Conservation Area increased the ratio of interior acreage to edge distance over the originally proposed design. This resulted in greater ratio of interior area-to-edge that is generally regarded as a more effective conservation reserve design. The design of the 13.4-acre Conservation Area thus increased its conservation value and increased the ability to maintain the restored habitat in a suitable condition over time.

Following further discussions with USFWS, the Conservation Area has been more than doubled in size to approximately 30.5 acres and includes the location where DSF were observed in 1998. This further increases the ratio of interior area-to-edge in the Conservation Area, and maximizes its conservation value. Significantly the Conservation Area is located so as to be contiguous with the SCE property to the north and west, which is likely to be used for DSF habitat restoration and protection in the future.

The proposed approximately 30.5-Acre Conservation Area contains small, sparsely vegetated sandy patches scattered within a matrix of otherwise typically dense vegetation cover. These sparsely vegetated sandy patches contain some native plant species including California croton, tarweed, fiddleneck and telegraph weed.

For the above reasons, the Conservation Area contains the most suitable and appropriately located habitat for DSF conservation found on the Project Site.

Following the further discussions with USFWS, concurrent with the issuance of the Section 10(a) Permits and prior to any ground disturbance on Lots 1, 2, or the Conservation Area will be restricted in perpetuity by a legal instrument such as a recorded Declaration of Restrictions or similar mechanism, and the Applicants an endowment fund, the annual proceeds of which will be used for ongoing maintenance, adaptive management, enhancement, monitoring, reporting and to respond to changed circumstances in the Conservation Area. The Applicants would also construct a chain link fence around the Conservation Area to prevent unauthorized access, construct a solid fence along the southern boundary of the Conservation Area to prevent soil loss, and perform initial weed and trash removal to increase the suitability of the Conservation Area for the DSF. In consultation with the USFWS, Permittees shall conduct initial weed and trash removal, where appropriate, throughout the Conservation Area within six months of the effective date. Provided that field experience on the Project Site demonstrates it is practicable, such chain link fencing will also use silting screens along lower portions of the fence to assist with Delhi series sand retention within the Conservation Area. The Conservation Area will be posted with signs indicating that the area is environmentally sensitive and that trespassing is prohibited.

Removal of dense nonnative vegetation and exposing bare sands is expected to provide improved habitat for DSF. For example, clearing of vegetation and exposing bare soil without planting on approximately one acre at the San Bernardino Hospital Mitigation Site resulted in DSF use of the cleared area in the subsequent DSF flight season. Moreover a population of the DSF is believed to exist nearby on SCE property near Riverside Avenue.

As noted previously, the USFWS has stated an objective of obtaining approximately 350 to 360 contiguous acres of DSF habitat within the AMEZ to be used for DSF conservation (USFWS 1996c, USFWS 1997). Furthermore, the USFWS has targeted the acquisition of approximately 50 of these acres to occur in an area near the Project Site. The Proposed Action would further this objective by contributing approximately 30.5 acres at no cost which could be directly linked with other properties in the area for DSF conservation.

There are other properties in the vicinity of the Site which are being considered for DSF conservation and may contribute toward the USFWS goal of an approximately 50-acre conservation area. These and other properties in the vicinity of the Project Site are shown in Exhibit 8 and Table 2.

There are approximately 10 acres in the SCE property contiguous with the north side of the Site on the east side of Riverside Avenue (Exhibit 8, Number 4). There are an additional approximately 9 acres in SCE property on the west side of Riverside Avenue (Exhibit 8, Numbers 7, 8). A DSF habitat restoration plan is being developed for the SCE properties. Implementation of the restoration plan is expected to begin in the near future. These SCE lands, protected and enhanced as DSF habitat, when combined with the 30.5 acres of potentially restorable DSF habitat proposed for protection on the Project Site, would provide approximately 50 acres of contiguous protected potential/suitable DSF habitat in the Site vicinity.

Approximately 6+ acres is planned to be protected for DSF conservation on the Owl Company access site (Exhibit 8, Number 10). Although this area is not contiguous with the SCE property to the north, which is expected to be protected as DSF habitat, the 6$^+$ acres will contribute to a DSF conservation area in the Project Site vicinity.

There is developed land between Riverside Avenue and Industrial Avenue, which separates the 6$^+$-acre DSF habitat area on the Owl Company access site and the Project Site (Exhibit 8, Numbers 13, 14, 16). This developed land does not provide DSF habitat and does not provide a continuous habitat linkage between the Owl Access site preserve area and any potentially restorable DSF habitat on the Project Site.

TABLE 2
PROJECT SITE VICINITY PARCELS

Exhibit 8 #	Property Owner**	Acreage *	Assessors Parcel #	Current Status	DSF Habitat Value**
1	Angelus Block	96	0260-061-36 0260-061-38/1,2,3,4	Undeveloped	Generally Low (60 Acres Potentially Restorable)
2	Agua Mansa Landfill	4.97	0260-061-35	Disturbed	None
3	Agua Mansa Landfill	14.17	0260-061-33	Disturbed	None
4	SCE	9.76	0258-131-08 0258-131-09 0258-131-11 0258-131-12	Undeveloped	Medium
5	Trism/Rialto Land Co./Singletary	9.75	0258-131-21	Undeveloped	Medium
6	Sooy	3.58	0258-121-34	Disturbed	Low
7	SCE	2.76	0258-121-21	Undeveloped	Medium
8	SCE	6.6	0260-011-42	Undeveloped	Medium
9	HRM Properties	18.4	0260-021-21	Undeveloped	Low
10	Owl Company (access site)	11.37	0260-021-12	Undeveloped	Low
11	Owl Company (highly disturbed site)	217	0260-021-04 0260-021-06 0260-021-07	Developed	Low
12	Empire Oil	.5	0260-161-12 (1)	Landscaped	Low
13	Alden	.5	0260-161-12 (2)	Developed	None
14	Empire Oil	1.01	0260-161-16	Developed	None
15	Empire Oil	.5	0260-161-15	Undeveloped	Low
16	Andrews	1.00	0260-161-10	Developed	None

Exhibit 8 #	Property Owner**	Acreage *	Assessors Parcel #	Current Status	DSF Habitat Value**
17	Horn	1.00	0260-161-09	Undeveloped	Low
18	Horn	1.00	0260-161-08	Undeveloped	Low
19	Williams	1.00	0260-161-07	Developed	Low
20	Alden	1.01	0260-161-06	Undeveloped	Unknown
21	Yoon	.75	0260-161-05	Undeveloped	Unknown
22	Singletary	.76	0260-161-04	Developed	None
23	Yoon	.75	0260-161-03	Undeveloped	Unknown
24	Singletary	.76	0260-161-02	Developed	None
25	Cummins	5.13	0260-161-01	Developed	None
* Acreage from Assessors Parcel Maps, not field verified ** As of Spring 1998					

There is also undeveloped land between Riverside Avenue and Industrial Avenue, which separates the 6^+-acre DSF habitat area on the Owl Company access site and the Project Site (Exhibit 8, Numbers 12, 15). This undeveloped land does not provide DSF habitat: it is largely underlain by non-Delhi Sands soil (USDA 1980) (see Exhibit 4); and contains ruderal weedy, non-native vegetation. The undeveloped land is also separated from the Owl Company access site and the Project Site by Riverside and Industrial Avenues, fragmenting a potential habitat linkage. Thus, this undeveloped land does not provide a continuous habitat linkage between the Owl Access site preserve area and any potentially restorable DSF habitat on the Project Site.

A continuous habitat connection between the Owl Access site preserve area and the Project Site could be provided by a corridor of DSF habitat across the 18.4-acre HRM property (Exhibit 8, Number 9) linking the SCE easement to the north with the Owl Access site. The HRM property currently contains largely ruderal vegetation dominated by non-native plants, but does contain some remnant native plants. The HRM site contains Delhi Sands soils (USDA 1980), and is thus potentially restorable as DSF habitat.

With these other potential DSF conservation areas a contiguous DSF conservation area could be assembled by connecting the approximately 30.5-acre Project Site Conservation Area, the 19-acre SCE easement properties, approximately 5 acres of 18.4-acre HRM property, and the 6^+-acre DSF preserve area on the Owl Access site. The contiguous DSF conservation area would comprise approximately 62 acres. Establishment of this potential conservation area would be aided significantly by dedication and enhancement of the 30.5-acre Conservation Area on the Project Site.

The Proposed Action will remove approximately 43 acres of potentially restorable DSF habitat. Implementation of the HCP however, will enhance the survival and recovery of the DSF by permanently preserving approximately 30.5 acres of potentially restorable habitat for DSF, providing for enhancement opportunities for the area to benefit the DSF, and providing an endowment for the annual maintenance and adaptive management of the habitat for the DSF in perpetuity in an area expected to offer long-term conservation value for the DSF.

An Implementing Agreement will be executed between the USFWS and Applicants to assure funding for and successful implementation of the HCP.

SECTION 4
CONSERVATION PLAN

The overall goal of this HCP is to enhance and protect potential habitat for the DSF in the Conservation Area in perpetuity and to enable the DSF to utilize the Conservation Area for long-term survival of the species. To accomplish this goal, the HCP sets the following objectives to be achieved during the life of the Permits.

1. Set aside and protect in perpetuity approximately 30.5 acres of potential habitat in the northern portion of the Project Site as a Conservation Area for DSF as shown in Exhibit 7..

2. Enhance and maintain the habitat value of the Conservation Area for DSF over the entire Conservation Area, by controlling human access, and debris, and removing non-native plants. Measurable performance standards for enhancement and maintenance of the Conservation Area will be identified in the enhancement/restoration plan prepared by the conservation organization/land manager and approved by the USFWS.

3. Increase the number of DSF on the Conservation Area such that a population of DSF can be sustained upon expiration of the Permits.

4. Establish a nonwasting endowment sufficient to generate at least $10,000/year in perpetuity for the: (1) ongoing maintenance, adaptive management, enhancement, and monitoring of the Conservation Area, (2) reporting of these activities, and (3) to respond to changed circumstances in the Conservation Area.

Specifically:

1. Angelus Block will redesign the proposed Angelus Block paver plant facility to relocate this facility to Lots 4-10. Angelus Block will redesign its block plant to utilize a smaller portion of Lot 1, thereby allowing approximately 6 acres of Lot 1 to be added to the Conservation Area. Lots 16-22 will also be made part of the Conservation Area, thereby maximizing the amount of conserved acreage in the area biologically preferred according to the USFWS.

2. The Permit Applicants will designate approximately 30.5 acres of the site (as depicted in Exhibit 7) as a Conservation Area for the DSF. The Conservation Area constitutes the best location on the Site for enhancement restoration measures to promote the long-term conservation of the DSF.

3. The Antonini Trust will dedicate fee title to the Conservation Area, at no cost, to a wildlife

conservation organization or agency or land manager which meets with the approval of the USFWS, and which will commit to managing habitat within the Conservation Area to benefit the DSF. Concurrent with the issuance of the Section 10(a) Permits and prior to any ground disturbance on Lots 1, 2, or 3, the Conservation Area will be restricted in perpetuity by legal instrument, such as a recorded Declaration of Restrictions. This Declaration of Restrictions, or other legal instrument, will be permanent and will provide that the Conservation Area will be restricted to conservation purposes for the DSF and its habitat, and the conservation of other sensitive species which may also benefit from this land without detriment to the DSF.

4. The Permit Applicants will construct a chain link fence around the Conservation Area to prevent unauthorized access, construct a soil retention fence or wall along the southern boundary of the Conservation Area to prevent soil loss, and perform initial weed removal in the Conservation Area and initial trash removal throughout the Conservation Area. In consultation with the USFWS, Permittees shall conduct initial weed and trash removal, where appropriate, throughout the Conservation Area within six months of the effective date. This work will be done outside the August-September adult DSF flight season. The intent of this initial activity is to provide some initial removal of non-native vegetation (such as mustard, Russian thistle, horehound) and to provide more open areas within the Conservation Area to benefit the DSF. The USFWS will identify for the Applicants the preferred plant species and recommended areas within the Conservation Area where such activity would be conducted. In consultation with the Service, the non-native vegetation removal is expected to be conducted through methods which may include hand clearing, use of weed-wackers, use of mowers, or some combination of these. The Conservation Area will be posted with signs indicating that the area is environmentally sensitive and that trespassing is prohibited

5. The Permit Applicants will establish a non-wasting perpetual maintenance endowment ("Endowment") for the benefit of the Conservation Area within 60 days of issuance of the Permits. The Endowment will provide funds for enhancement, annual maintenance, adaptive management, enhancement, monitoring, reporting and to respond to changed circumstances in the Conservation Area. The Endowment has been established at a level to account for inflation. The Endowment will be able to provide funding of at least $10,000/year in perpetuity for the Conservation Area. The management and maintenance of the Conservation Organization will include weeding of non-native plants, planting of native plants, redistribution of sand across the area, fence repair, and trash removal in perpetuity. The management and maintenance of the Conservation Area will be done by the Conservation Organization in perpetuity. Any funds not spent from the annual income from the Endowment at the end of any year will be placed in an interest-bearing Adaptive Management Account by the Permittees or the Conservation Organization managing the

Conservation Area (or an Endowment manager acceptable to the Permittees and USFWS), or invested in an alternative manner, and will be allowed to accumulate, as prudent, to be used as necessary to respond to any future Changed Circumstances and shall be used solely to maximize the Conservation Area's value for the DSF. The Conservation Organization and the USFWS will consult with one another to determine what is prudent in this regard. If, during the term of the Permits, the managing entity of the Endowment is dissolved, a new managing entity will be selected by the Permittees in consultation with and approval of the USFWS.

6. Five acres of mitigation credits within the Conservation Area will be available for purchase to mitigate for either direct impacts to DSF resulting in take of DSF, or for impacts to DSF habitat, on other properties. The mitigation credits may be sold in one-tenth acre (0.10 acre) units. Proceeds from the sale of mitigation credits would be used to help defray the Applicants' costs in establishing the Conservation Area and endowment fund. The purchase of mitigation credits from the bank will not, of itself, authorize Incidental Take for projects purchasing mitigation credits. Those projects may require independent Incidental Take authorization.

7. The Antonini Trust will construct chain-link fencing around the perimeter of the Conservation Area. The Permit Applicants will continue to maintain this fence until the Conservation Area is dedicated in fee title to a conservation organization, as detailed below.

8. The Applicants or their assigns reserve the right to further enhance or use the Conservation Area for the benefit of other future listed species provided that: (1) USFWS approves such enhancement or use of the Conservation Area, and (2) such actions would not be expected to decrease the value of the Conservation Area for the DSF. If the USFWS determines in writing that such proposed enhancement would negatively impact the DSF, the USFWS may preclude such enhancement by the Permittees.

9. The Conservation Area will be avoided during construction operations on the remaining lots of the Site. In addition, the Antonini Trust will place warning signs at appropriate locations along the fence and perimeter of the Conservation Area, informing the public that this area is protected habitat and considered off-limits to the general public, in an effort to discourage entry into the Conservation Area by unauthorized individuals.

10. Access to the Conservation Area will be limited to SCE, the City of Rialto, and the West San Bernardino County Water District. SCE will access the Conservation Area via use of the 16-foot wide access road that is within SCE's electrical transmission easement inside the Conservation Area (and such other related easement uses). The City of Rialto

and the West San Bernardino County Water District will access the Conservation Area via Lot 1, the dedicated Bunting Way, and Fortuna Way for utility maintenance. SCE, the City of Rialto, and the West San Bernardino County Water District will not receive authorization for incidental take of DSF within the Conservation Area or the Permit Area by virtue of the Applicants Section 10(a) permits. Thus, SCE The City of Rialto, and the West San Bernardino County Water District would continue to remain precluded from taking any action in the Conservation Area that would result in incidental take of any DSF in the absence of their own independent incidental take authorizations from the USFWS. Otherwise, only conservation and habitat or species restoration efforts will be permitted within the Conservation Area.

11. The Antonini Trust will contact representatives of SCE, the City of Rialto, and the West San Bernardino County Water District and explain the importance of the Conservation Area for wildlife conservation and DSF conservation and recovery in particular. The Antonini Trust will make its best efforts to obtain written acknowledgement from SCE that it will inform appropriate SCE employees of the need to keep its equipment and activities within the Conservation Area limited to the access road.

12. The Permit Applicants will consult with the Rialto Fire Department (RFD) concerning vegetation management for fuel reduction. There will be areas of non-flammable material (paved parking and roads) immediately outside the Conservation Area. The cul-de-sac immediately south of the Conservation Area will be 60 feet wide with an additional 25 feet setback south of the cul-de-sac. Parking and storage of non-flammable product is planned adjacent to the Conservation Area on the Project Site. The RFD has stated that it consults with USFWS concerning vegetation control in areas of potential DSF habitat and generally follows USFWS recommendations (Barajas pers. comm.). The RFD makes recommendations on a site-specific basis based on a site visit and discussions with property owners and the USFWS.

13. The Applicants and/or their agents will undertake the following actions during construction to minimize direct and indirect effects of construction activities on biological resources:

- If not otherwise yet installed, temporary fencing will be installed around the Conservation Area prior to commencement of construction activities, including grubbing and clearing of vegetation.

- Construction limits will be fenced or flagged and signed prior to construction activities to avoid the inadvertent disturbance of outlying areas.

- If construction activities occur during the DSF flight period, a biologist approved by USFWS will monitor the Construction Area. The monitoring biologist will have the authority to halt construction to prevent or avoid take of listed species and/or to ensure compliance with all avoidance, minimization and mitigation measures.

- Activities such as grading, stockpiling and excavating of soil, parking and storage of equipment, and ingress and egress of vehicles and personnel will not be permitted within the fenced Conservation Area and will be limited to the designated construction zones.
- The proper use and disposal of oil, gasoline, and diesel fuel will be enforced.
- All construction personnel will be take part in an education program. Construction personnel will be advised that the DSF is listed under the Act and the importance of staying out of the Conservation Area. All construction related avoidance minimization and mitigation requirements will be identified and discussed including construction limits and conservation measures.
- All trash associated with construction or personnel on the site will be properly contained and disposed.
- Construction activities that occur within a minimum distance of 50 feet from the Conservation Area will be monitored to ensure that dust accumulation on the plants is minimized.

14. The Applicants will replace any temporary fencing with permanent chain link fencing along the north, east and west boundaries of the Conservation Area within 120 days of issuance of the Permits. This work will be done outside the August-September adult DSF flight season. Provided that field experience on the Project Site demonstrates it is practicable, such chain link fencing will also use silting screens along lower portions of the fence to assist with Delhi series sand retention within the Conservation Area. Within 30 days of issuance of the Permits, Antonini Trust or Angelus Block shall provide an irrevocable letter of credit in the amount of $10,000 to ensure funding to establish a soil holding fence, wall or similar structure along the southern boundary of the Conservation Area. Antonini Trust or Angelus Block shall establish this soil holding fence, wall or similar structure along the southern boundary of the Conservation Area within one year of issuance of the Permits.

15. For lighting requirements under the Applicants' control and to the extent practicable and consistent with the needs for safety, security, and safe operation of the facilities, outdoor nighttime lighting for those facilities on those lots bordering the Conservation Area (Lots

1, 14 and 15) will be directed away from the Conservation Area to minimize detrimental impacts to DSF in the Conservation Area during the adult DSF flight season in August and September. The Applicants will consult with the USFWS in the development of the final plan for the outdoor lighting of these particular lots. The Applicants will have final decision-making authority on the design and implementation of such outdoor lighting.

16. The USFWS and Applicants will work cooperatively to find a suitable conservation organization/land manager that will monitor and maintain the Conservation Area. The endowment fund will be used to fund the activities described below:

    Three months after a Conservation Organization/land manager is identified, and approved by both the USFWS and permittees an enhancement/restoration plan prepared by the Conservation Organization with assistance from USFWS, that includes weeding, seed collection, success criteria, monitoring, etc. for the Conservation Area will be submitted to the USFWS for review and approval.

    - The Conservation Organization will conduct adult focused surveys for the DSF annually in the Conservation Area using a USFWS-approved biologist during the adult flight period. The focused surveys will begin the first flight season after the commencement of construction, but in no event prior to the year 2000. Yearly monitoring efforts will be conducted for the first 3 years and thereafter be evaluated annually by the USFWS in cooperation with the Conservation Organization to determine whether focused surveying for that year would be appropriate. All focused DSF survey results and will be provided to the USFWS within 45 days of completion of surveys.

    - The Conservation Organization will conduct monitoring at least biannually for the first 5 years. The emphasis of the monitoring effort will be to assess and report on the status of target weed species and native cover. The removal of non-native target weed species and the collection and broadcasting of native seed will be conducted. The Conservation Organization will provide the USFWS with an annual report to determine the restoration success based on the performance criteria established in the enhancement/revegetation plan.

    - Performance standards will include criteria which can be measured. Factors to be evaluated will include: (1) percent vegetation cover by strata; (2) target or management indicator species; (3) target native plant diversity and composition, (if monitoring indicates a high level of non-native plant species, corrective action will be required); (4) evidence of natural reproduction; and (5) percent survivorship.

Five-Year Maintenance and Monitoring Program: The Conservation Organization will monitor progress of the enhancement/revegetation efforts biannually to ensure that yearly performance standards are maintained. The Conservation Organization will conduct seeding or weed removal promptly to meet established performance standards, as necessary. The Conservation Organization shall keep accurate records of the following:

- Existing conditions of the Conservation Area, including descriptions of vegetation composition, weed species and erosion problems;

- Enhancement/revegetation site preparation and planting techniques utilized: seed quantities, timing, weather conditions, and any problems encountered during planting;

- Maintenance activities implemented, including methods used for weed control, timing and locations of germination for seeded species, and response of vegetation areas to changes in weather conditions;

- Qualitative and quantitative monitoring data related to performance standards;

- Remedial measures and maintenance activities required; and

- Maintenance will be completed as necessary for the five-year period in the Conservation Area. Maintenance requirements to be carried out by the conservation organization in the Conservation Area include:

    - Weed control

    - Debris and trash removal

    - Limiting human access and fence and signage repair

Reporting: The conservation organization shall submit a yearly monitoring report to the USFWS on or by December 31. The monitoring report shall provide all reasonably available data regarding the incidental take. In addition, the report will:

- Describe the progress of the enhancement/revegetation effort;

- Identify any problems encountered, detail corrective measures and evaluate their efficacy;

- Include results of species surveys; and

- Include copies of monitoring and maintenance records.

Continued Maintenance and Monitoring: At the end of the fifth year, the conservation organization shall submit a status report to the USFWS. If the enhancement/revegetation program has met the specified performance standards, the USFWS shall acknowledge the completion of the enhancement/revegetation program. If such a determination cannot be made, maintenance or re-seeding shall be prescribed and monitoring will be extended until performance criteria are met.

Long-term Maintenance: Upon completion of the five-year maintenance and monitoring period, the conservation organization shall implement a long-term maintenance program. The conservation organization shall conduct routine maintenance to maintain fencing and signage, ensure trash removal, and eliminate weed problems.

- Biannual plant surveys of Conservation Area will be conducted by the conservation organization. Photographs will be taken to document habitat conditions.
- Fencing and signage will be monitored by the conservation organization to ensure that both are maintained. Areas where signage is removed or fencing is breached will be monitored as necessary to maintain fencing and sign integrity.
- Focused DSF survey efforts will be evaluated for the long-term monitoring program by the USFWS in cooperation with the conservation organization. The agreed upon protocol will be incorporated into the long-term maintenance and monitoring plan.

An Implementing Agreement (IA) will be executed between the USFWS and the applicants to assure the implementation of the HCP.

For Covered Activities as defined in the IA, the USFWS will acknowledge to the City of Rialto, the County of San Bernardino, and any other appropriate government jurisdiction, agency or department, that the conservation and recovery activities being undertaken by Permittees pursuant to this HCP are sufficient under the Endangered Species Act to alleviate Permittees or Other Subsequent Land Purchasers as set forth in the IA (of land within the approximately 65 acres permitted for incidental take) from any additional conservation measures, biological mitigation measures, financial contributions, land donations or set asides or other land use restrictions which could be sought to be imposed on land within the Permit Area for the DSF through some other regional (i.e., single or multi-jurisdictional) species or habitat conservation plan or Natural Communities Conservation Plan (collectively, "Additional Measures"). However, the Permittees or other subsequent land purchasers are not relieved from obtaining independent incidental take authorization for any future listed species which is listed and which would be incidentally taken by a covered activity under the currently proposed permits in the Permit Area. The USFWS will not recommend that any Additional Measures be required or imposed upon land within the Project Site authorized for DSF incidental take to any government jurisdiction, agency or department, nor shall the USFWS require, recommend or impose such Additional Measures in connection with the approval of any regional species or habitat conservation plan including the Project Site in its boundaries, except as required by law. The Permittees or other subsequent land purchasers will not be precluded from enrolling their ownership of land in the Project Site in some other species or habitat conservation plan as well; provided that such landowner agrees to contribute any necessary additional mitigation for any additional incidental take authority for species in addition to the DSF. The USFWS will fully credit Permittees or other subsequent land purchasers for the biological contribution made for the benefit of listed species in addition to the DSF, if any, for species proposed to be covered under a regional species or habitat plan, in connection with the Permit's HCP when considering whether the Project

Site, or a portion thereof, may also be included in any future conservation plan which may provide incidental take authority for more species than the DSF.

The Permit Applicants have entered into a Consent Decree with the United States pertaining to litigation between Permit Applicants and the United States government concerning activity on the Project Site and its potential for the take of the DSF. This Consent Decree was approved by the United States District Court for the Central District of California in June 1999. Under the terms of that Consent Decree, the Permit Applicants have committed to conduct certain measures to promote the recovery and conservation of the DSF, and in return, the United States government has agreed that certain activities may proceed on a portion of the Project Site without further objection from the federal government. Conservation measures on the Project Site provided for under the Consent Decree include fencing the proposed approximately 30.5 acre Conservation Area, avoiding impacts to the proposed Conservation Area during construction activities on certain Lots outside the Conservation Area, placing a deed restriction for DSF conservation purposes on a portion of the Project Site (including Lots19-22 and the formerly proposed Bunting Drive) and providing biological monitoring of construction areas to minimize any take of DSF if such construction activity is occurring during the 1999 DSF flight season. (The USFWS prepared a Biological Opinion to analyze the potential for take in connection with development on Lots 11-15 and Lots 4-10 under the Consent Decree as well as the mitigation and benefits associated with the conservation measures required by the Consent Decree.) This HCP, the associated Implementing Agreement, the Permits and the associated Biological Opinion, if approved by the Service, will replace the terms and conditions of the Consent Decree and its associated Biological Opinion.

MIGRATORY BIRD TREATY ACT

The Applicants recognize that the Section 10(a) Permits, should they be issued by the Service, do not relieve the Applicants from assuring compliance with thee Migratory Bird Treaty Act ("MBTA"). The Applicants will conduct grading or clearing activities within the Permit Area in compliance with the requirements of the MBTA.

RESPONSE TO UNFORESEEN CIRCUMSTANCES

Provisions for addressing unforeseen circumstances generally are required for long-term permits and HCP programs. (See H.R. Rep. No. 97-835, 97th Cong., 2nd Sess.). Such provisions are appropriate and required where the applicant and USFWS are likely to be faced with changing circumstances during the course of the project or with respect to impacts on the affected species over time. Under the USFWS's recent "No Surprises" rule, any such provisions may not require the Applicants to commit additional land, water, or financial compensation or additional restrictions on the use of land, water, or other natural resources beyond the level otherwise agreed upon in this HCP: provided that the HCP is properly implemented.

It is not likely that the Applicants or the USFWS will be faced with unforeseen circumstances requiring such provisions, inasmuch as: the area of development associated with this project is relatively small (approximately 65 acres); a portion of this Site is expected to be developed within the first year of the Permit; the area of development does not lie within a significant biological corridor for the DSF; the developable land under this HCP currently does not constitute generally suitable habitat for the DSF; and, the amount of take of DSF is expected to be low.

Nevertheless, Section 16.0 of the IA contains provisions for dealing with unforeseen circumstances.

RESPONSE TO CHANGED CIRCUMSTANCES

As necessary and appropriate, an HCP conservation program may include conditional conservation and mitigation measures to be effectuated in the event of the occurrence of reasonably foreseeable "changed circumstances" specifically identified in the Plan. 50 C.F.R. §17.22(b)(5)(i). USFWS regulations define the "changed circumstances" that an HCP may address in this context as "changes in circumstances affecting a species or geographic area covered by a conservation plan that can reasonably be anticipated by plan developers and the Service that can be planned for (e.g., the listing of new species, or a fire or other natural catastrophic event in areas prone to such events)." 50 C.F.R. §17.3.

Given this regulatory framework, four categories of potential "Changed Circumstances" related to the DSF or Project Site that reasonably may be anticipated during the term of the permits bear mention: (1) changes to the vegetative cover or other geophysical conditions on the Site (including those arising from potential periods of drought or excessive rainfall in the HCP area, significant fires within on-Site areas containing Delhi Sands soils, etc.); (2) changes concerning the DSF (including accelerated decline in the number of extant DSF populations or the size of one or more such populations, the future use or occupation of the Conservation Area by DSF, etc.); (3) a further significant reduction in the number of acres of Delhi Sands soils in San Bernardino and Riverside Counties; and (4) listing under the ESA of other species that occur on the Site.

Responding to changed circumstances related to conditions on the Site can be accomplished by adaptively managing the Conservation Area to maximize DSF conservation objectives with the annual proceeds of the endowment fund to be established pursuant to the Proposed Action. Indeed, the flexibility to carry out such "adaptive management" of the Conservation Area should only increase over time, as costs of affirmative measures necessary to monitor and maintain the Conservation Area as suitable habitat should gradually decline after the first 3-5 years. The annual proceeds from the endowment have been set at a level which will produce proceeds which will accumulate over time in a sub-account which will be established to address changed circumstances through adaptive management of the Conservation Area. This approach is particularly well suited to deal with reasonably foreseeable changes to on-Site conditions. For example, in the event fire broke out within the Conservation Area, endowment fund proceeds could be used to revegetate the Conservation Area with native species associated with DSF habitat, thereby providing greater certainty that the Conservation Area would be able to more quickly return to suitable habitat than if natural recolonization were allowed to occur.

If the changed circumstances relate to DSF viability (e.g., a further decline in the number of extant DSF populations or the size of one or more such populations), the Permit Applicants would allow DSF to be introduced within the Conservation Area, but the USFWS would provide adequate assurances to the Applicants that they would not be prejudiced by such introduction (e.g., presence of introduced DSF on the Site would not lead to liability or increased regulatory constraints under the ESA or any other law or regulation). In addition, pursuant to the IA, the Permittees are providing the USFWS with the right of first refusal to buy the Delhi Sands soils, if any, that the Permittees intend to export from the Project Site while preparing lots for development. The USFWS would have thirty days from the date of offer to purchase such soils. Should the DSF's status in the Colton Recovery Unit area worsen to the point of becoming extirpated from the area, funds in the aforementioned adaptive management/changed circumstances sub-account of the endowment fund established by the Proposed Action may be utilized in a captive breeding effort. Moreover, even if any such adverse changes to DSF viability occurred, at least to a reasonably anticipated degree, the Proposed Action is not likely to jeopardize the continued existence of the DSF because (1) to the extent the Site is occupied by DSF, any such occupation is minimal (only four DSF observations on a single day in four years of surveys); and (2) the only area of DSF observation has been placed in the Conservation Area, (3) completion of the Proposed Action will result in a Site that has far superior potential than does the status-quo for both eventual, regular use of the Site by DSF and for making a contribution to long-term DSF recovery.

The preamble to the No Surprises Rule states that the listing of a new species as endangered or threatened, which species occupies the Permit Area, may constitute a changed circumstance. The USFWS shall immediately notify Permittees upon becoming aware that a species which is associated with habitat found on the Permit Area may be or has been proposed for listing. Upon receipt of notice of the potential listing of such species, Permittee(s) or other subsequent land purchasers may, but is/are not required to, enter into negotiations with USFWS regarding necessary modifications, if any, to the HCP required to amend the

Permit(s) to cover the covered species. If Permittee(s) or other subsequent purchasers of land on the Project Site elect(s) to pursue amendment of the applicable Permit, the USFWS will provide technical assistance to Permittee(s) or other subsequent land purchasers to identify any modifications to the HCP that may be necessary to amend the applicable Permit. Paragraph 15.3 of the IA provides more details of the process to be followed in the event of Changed Circumstance and the response to such events. Under either scenario, the Applicants will be granted credit for the conservation value for any newly listed species that has arisen from the establishment and management of the Conservation Area and may seek to have future management of the Conservation Area be modified to benefit the new species (1) if approved by the USFWS and (2) if such modifications would not be expected to meaningfully decrease the value of the Conservation Area for DSF.

SECTION 5
ALTERNATIVE ACTIONS CONSIDERED

Pursuant to 50 C.F.R. Section 17.22(b)(1)(iii)(C), the applicant is to identify in the HCP the alternatives considered to the Proposed Action and the reason why such alternatives were not selected. The alternatives to the Proposed Action (i.e., obtaining Section 10(a) permits and proceeding with development and operation of industrial or other facilities on approximately 65 acres and donating approximately 30.5 contiguous acres of the property for DSF recovery and conservation purposes in the AMEZ area and providing an endowment fund to provide funds for annual maintenance, adaptive management, and to respond to changed circumstances in the Conservation Area in perpetuity) are: (1) abandonment of the industrial facility projects (the "No Project" alternative), (2) abandonment of the industrial facility projects and establishment of a DSF habitat mitigation bank, (3) redesign of some industrial facility projects and establishment of a 24-acre Conservation Area and a habitat mitigation bank within a portion of a dedicated Conservation Area, (4) completion of the industrial facility projects without Section 10(a) permits and HCP (the "No Action" alternative), (5) participation in the AMIGA HCP or San Bernardino Valley-wide Multiple Species Plan, (6) Development of 83 Acres, dedication of a 13.4 Acre Conservation Area, habitat restoration and providing an Endowment Fund for maintenance and management of the Conservation Area, and (7) the Proposed Action.

ALTERNATIVE 1: NO PROJECT

Under this alternative the Angelus Block facilities (the block and paver plants) and the E-Z Mix East Complex would not be constructed on the Site. Nor would the remaining lots be used for other industrial uses or sold to other industrial users.

Under this alternative, the 96-acre Site would remain subject to various forms of human disturbance. Trampling, illegal trash and other dumping and ORV disturbance could negatively impact areas of potentially restorable DSF habitat on the Site. No measures would be taken by the Applicants to secure and enhance or restore any portion of the Site for recovery or conservation of the DSF. Non-native, invasive plant species would continue to dominate the Site

The Antonini Trust purchased the Site in 1989 for industrial uses. The market price paid reflected the zoning of the property for industrial uses. Since the purchase date, the Applicants have spent considerable sums to complete the local entitlements, satisfy the conditions for final map recordation, design the Angelus Block facilities, and satisfy the property tax burden on the Site. Abandonment of the industrial development of the Site would therefore be impracticable and uneconomical in terms of the Applicants realizing their reasonable expectations for the improved Site and community benefits as well as providing an adequate economic return against their considerable costs and expenses.

ALTERNATIVE 2: PROJECT ABANDONMENT AND ESTABLISHMENT OF A DSF MITIGATION BANK ONSITE

Establishment of a DSF habitat mitigation bank on the Site would eventually result in approximately 73 acres of potentially restorable DSF habitat. The success of the mitigation area would be dependent on funding and conservation efforts of others. The certainty of these efforts is not known.

In four years of focused surveys DSF have been observed on one day on the Project Site, and the Site generally provides unsuitable habitat for the DSF in its current disturbed condition.

The market for mitigation bank acreage to offset impacts to DSF is largely unknown. There are no reasonable assurances that the 73-acres of potential mitigation bank credits could produce enough economic return to be a profitable alternative for the Applicants. Furthermore, this alternative would not meet the Applicants' need for a suitable location for the Angelus Block manufacturing facilities.

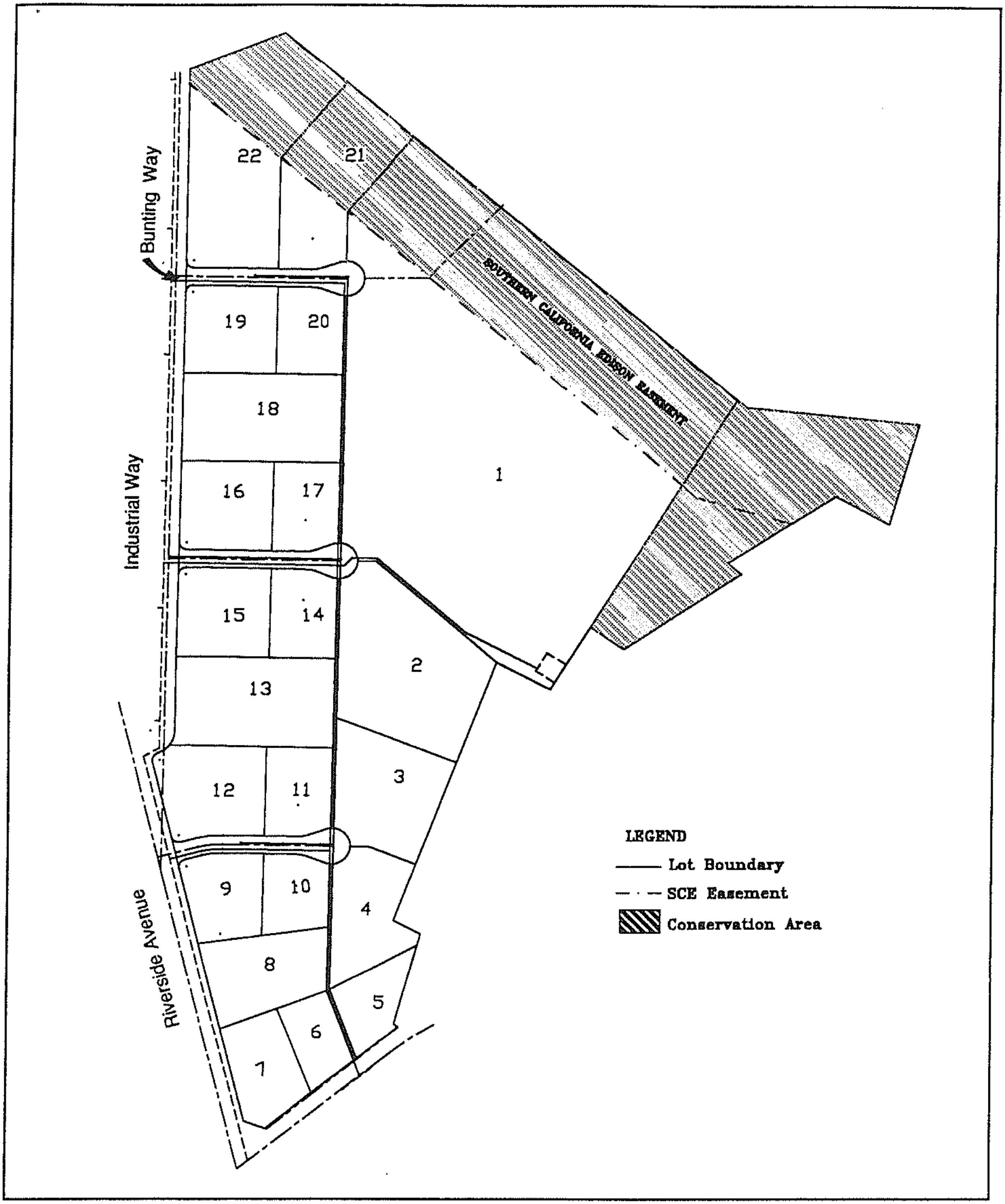
ALTERNATIVE 3: REDESIGN OF SOME OF THE INDUSTRIAL FACILITY PROJECTS AND ESTABLISHMENT OF A CONSERVATION BANK WITHIN A PORTION OF A CONSERVATION AREA

This was the original proposed action under consideration by the Applicants prior to discussions with USFWS in early 1998 and subsequent redesign of the project.

This alternative would identify a 24-acre Conservation Area within the Site, and would dedicate 10 acres of the Conservation Area at no cost. The Conservation Area would consist of approximately 24 acres and would be located along the entire northern/northeastern boundary of the Site, extending from Industrial Drive to Agua Mansa Road on the southeast and include the eastern 8.4-acre parcel (Exhibit 9). This alternative would also establish a DSF conservation mitigation credit bank on the remaining 14 acres within the Conservation Area. This alternative would entail the redesign of the anticipated block plant on Lot 1.

This alternative would provide less total acreage in the Conservation Area than the Proposed Action, and would provide a lower level of conservation benefit to the DSF compared with the Proposed Action. Under this alternative, the long narrow Conservation Area would not minimize "edge effects," would contain land in the bluff area on the south of the Site that is more distant from other land being considered by others for DSF conservation areas, and would not contain the land further west on the Site (portions of Lots 21 and 22 south of the SCE easement) which the USFWS considers more valuable for the DSF.

Alternative 3 would also differ from the Proposed Action in that it would (1) allow the Applicants to suffer less of an economic hardship by virtue of the Applicants' voluntary conservation efforts, and (2) allow Angelus Block to maintain the paver plant at its originally designed location on Lots 21 and 22.



Michael Brandman Associates

Exhibit 9

Alternative 3 Proposed Conservation Area

20620002 • 6/99

ANTONINI TRUST / ANGELUS BLOCK • DELHI SANDS FLOWER-LOVING FLY HCP/EA

This alternative was not selected because the USFWS has indicated that it would not issue Incidental Take Permits to the applicants based on this HCP design.

ALTERNATIVE 4: PROJECT COMPLETION WITHOUT A SECTION 10(A) PERMIT (THE "NO ACTION" ALTERNATIVE)

This alternative provides for the Applicants to proceed with project completion without obtaining a Section 10(a) permit authorizing incidental take of the DSF. The applicants believe that this alternative is available inasmuch as the Project Site may not contain DSF or any other listed species, and thus the development of the Site may not result in "take" under the ESA. Focused surveys conducted over three consecutive years (1995-1997) indicated that DSF do not occur on Site. USFWS policy provides that a site is to be considered unoccupied by the DSF if two years of properly conducted DSF surveys yield no DSF observations. Focused DSF surveys in 1998 revealed four observations on a single day. No observations were made on any other day, during a year that has been postulated as being an optimal year for DSF observations. The location of these observations and lack of observations elsewhere suggest that these individuals may have migrated from another site. Also, it is certain that the individuals observed did not survive after September 1998, and it is not known whether any female successfully oviposited any eggs in onto the soil and whether any such eggs would remain viable at this time. Although USFWS might assert that the August 27, 1998 observations established that at least a small portion of the project site is occupied, such occupation is speculative and cannot be established. Accordingly the Applicants believe that they may legally proceed to develop the Site without a Section 10(a) Permit from USFWS. Under this alternative, the Applicants would not provide approximately 30.5 acres in the northern portion of the Site to be used for DSF mitigation. Under this alternative, no potentially restorable DSF habitat would be protected. This alternative was not selected because the applicants believe a more timely and long-term resolution of land use issues can be achieved via the Proposed Action rather than proceeding without a Section 10(a) permit.

ALTERNATIVE 5: PARTICIPATION IN AMIGA HCP OR SAN BERNARDINO VALLEY-WIDE MULTIPLE SPECIES PLAN

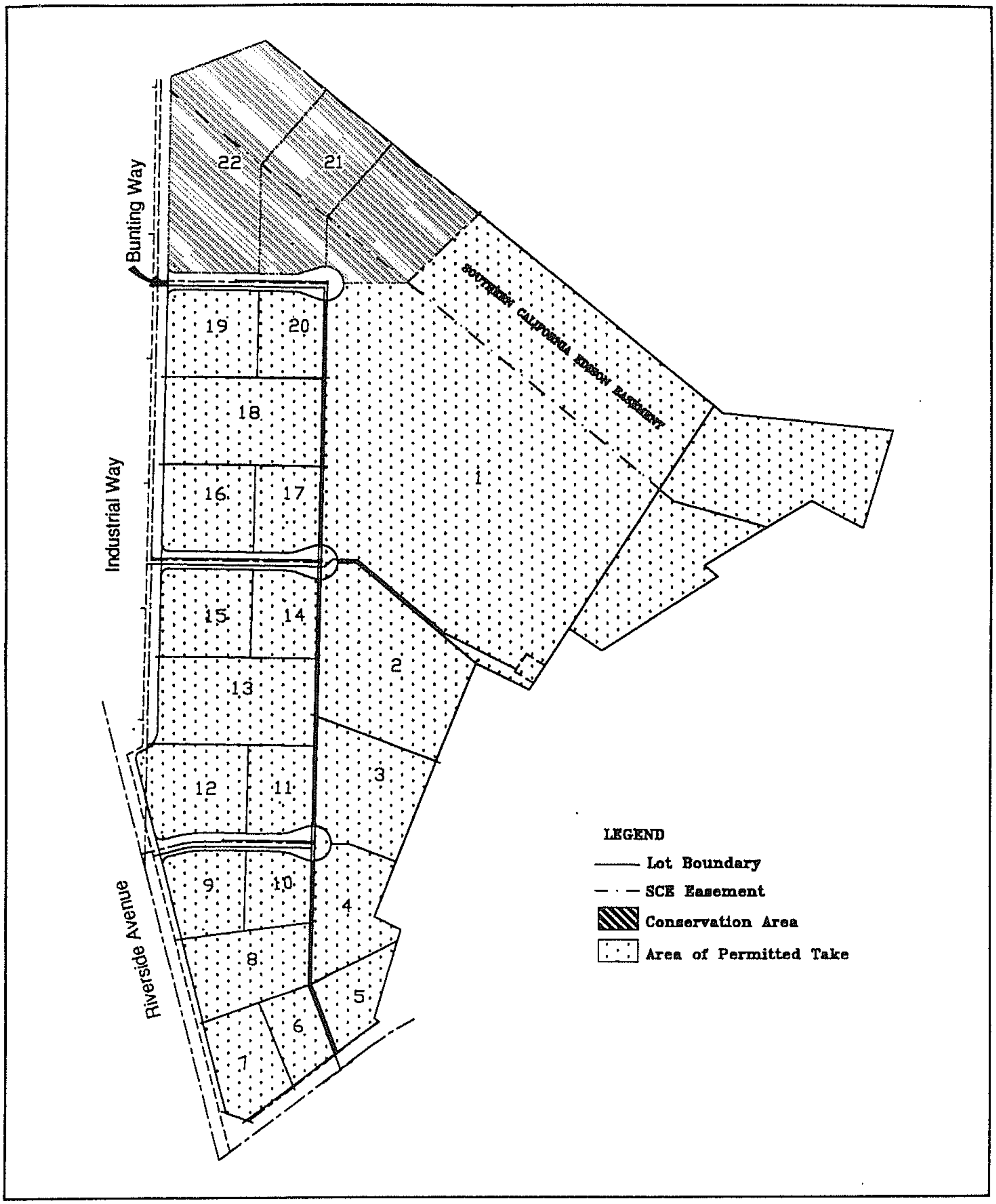
Under this alternative, the Applicants would mitigate for any take of the DSF by participating in a larger HCP plan area established by either the AMIGA or a collection of local jurisdictions under a multi-species HCP for a portion of San Bernardino County, as opposed to their own site-specific HCP. This alternative was rejected, as there is no alternative HCP program in place and neither the AMEZ nor the relevant local jurisdictions in San Bernardino County are likely to establish a program that would be available to the Applicants within the foreseeable future.

ALTERNATIVE 6: DEVELOPMENT OF 83 ACRES, DEDICATION OF A 13.4 ACRE CONSERVATION AREA, HABITAT RESTORATION AND PROVIDING AN ENDOWMENT FUND FOR CONSERVATION MAINTENANCE AND MANAGEMENT

This alternative consists of proceeding with development pursuant to the approved existing entitlements, and obtaining Section 10(a) permits for incidental take of the DSF. This alternative would result in construction within potentially restorable habitat for the DSF. This alternative would dedicate a 13.4-acre Conservation Area to a conservation organization at no cost, and additionally would restore habitat for DSF in the Conservation Area and provide a maintenance endowment in perpetuity for the Conservation Area. The Conservation Area would be located in the most valuable location on the Site for the future recovery and conservation of the DSF. See Exhibit 10. The Conservation Area would be used for the recovery and conservation of the DSF. This alternative would result in construction within approximately 60 acres of potentially restorable DSF habitat. This alternative was not selected because the USFWS has indicated that it would not issue Incidental Take Permits to the Applicants based on this HCP design.

ALTERNATIVE 7: PROPOSED ACTION

This alternative would dedicate an approximately 30.5-acre Conservation Area in the northern portion of the Site that would be transferred in fee title to a conservation or wildlife organization or agency at no cost, to be used to promote the conservation of the DSF (see Exhibit 7). The paver plant, originally redesigned to Lots 16-20, will be redesigned again to be located on Lots 4-10. Lots 16-20 will be added to the Conservation Area. The originally planned Bunting Drive will be eliminated as a paved road and cul-de-sac, and this area will become part of the Conservation Area. The block plant will also be redesigned so that an additional approximately 6 contiguous acres can be added to the Conservation Area. An endowment fund would be established by the Applicants, the annual proceeds of which would be used for habitat enhancement and ongoing maintenance, adaptive management, enhancement, monitoring, reporting and to respond to changed circumstances in the Conservation Area, in perpetuity. The Applicants would also fence the Conservation Area to prevent unauthorized access, construct a solid fence along the southern boundary of the Conservation Area to prevent soil loss, and perform initial weed and trash removal. This alternative would result in construction in approximately 43 acres of potentially restorable DSF habitat.



Michael Brandman Associates

Exhibit **10**

Alternative 6 Proposed Conservation Area

20620002 • 6/99

ANTONINI TRUST / ANGELUS BLOCK • DELHI SANDS FLOWER-LOVING FLY HCP/EA

SECTION 6
OTHER MEASURES

Section 10(a)(2)(A)(iv) of ESA provides that an HCP should include any additional measures required by the Secretary of the Interior as being necessary or appropriate for purposes of the HCP. The Applicants have discussed the proposed elements of this conservation plan with the USFWS, and no such additional elements have been identified.

SECTION 7
ORGANIZATIONS AND INDIVIDUALS CONSULTED

Agencies and persons consulted during the course of preparing this HCP are listed below.

U.S. FISH AND WILDLIFE SERVICE

Jon Avery, Carlsbad USFWS Office, Carlsbad, California
Jim Bartel, Carlsbad USFWS Office, Carlsbad, California
Laura Hill, Portland Regional Office, Portland, Oregon
Jeffery M. Newman, Carlsbad Field Office, Carlsbad, California
Mary Beth Woulfe, Carlsbad Field Office, Carlsbad, California

CITY OF RIALTO

Norma Barajas, Rialto Fire Department, Rialto, California

OTHER INDIVIDUALS

Kim Gould, Southern California Edison (SCE)
Dan Pearson, Southern California Edison (SCE)

SECTION 8
REPORT PREPARATION PERSONNEL

The individuals listed below were responsible for preparation of this HCP.

NAME	RESPONSIBILITY	COMPANY AFFILIATION
Michael Brandman, Ph.D.	Principal-in-Charge	Michael Brandman Associates
Larry D. Munsey	Entomologist	Larry Munsey International
Andrew Hartzell	Attorney-at-Law	Hewitt & McGuire, LLP
Gregg B. Miller	Senior Scientist	Michael Brandman Associates
Carey Cramer	Graphic Artist	Michael Brandman Associates

SECTION 9
REFERENCES

Ballmer, G. 1989. Petition to the U.S. Fish and Wildlife Service to List *Rhaphiomidas terminatus abdominalis* as Endangered. 11 pp.

Ballmer, G. 1992. Petition to the U.S. Fish and Wildlife Service for Emergency Listing of *Rhaphiomidas terminatus abdominalis* as an Endangered Species. 2 pp.

Barajas, Norma, Rialto Fire Department, Fire Prevention Division. January 22, February 4, May 4 1998. Telephone conversations with Gregg Miller.

California Department of Fish and Game (CDFG). 1991. California Wildlife Habitat Relationships Database System. The Resources Agency of California. Sacramento, California.

California Department of Fish and Game (CDFG). 1996a. Special Plants List. California Department of Fish and Game, Natural Diversity Data Base. The Resources Agency of California. Sacramento, California. 111 pp.

California Department of Fish and Game (CDFG). 1996b. Endangered, Threatened, and Rare Plants of California. The Resources Agency of California. Sacramento, California. 14 pp.

California Department of Fish and Game. 1997. RareFind 2 personal computer program. Data Base Record Search for Information on Threatened, Endangered, Rare, or Otherwise Sensitive Species for the Corona Fontana, and San Bernardino South California USGS Topographic Quadrangles. . California Department of Fish and Game, State of California Resources Agency. Sacramento, California.

Cazier, M.A. 1985. A Revision of the North American Flies Belonging to the Genus *Apiocera* (Diptera, Apioceridae). Bull. Amer. Mus. Nat. Hist. 182:181-263.

ENSR, 1995. Environmental Assessment for the Issuance of an Incidental take Permit Under Section 10(A)(1)(B) of the Endangered Species Act for the Endangered Delhi Sands Flower-loving Fly Colton Transmission Line and Substation Project by the City of Colton. Prepared for the U.S. Fish and Wildlife Service. Prepared by ENSR Consulting and Engineering.

ENSR, 1997. Biological and Cultural Resource Evaluation Report Visy Project. Prepared for the City of Colton, Colton California.

FH&A, 1994. Report of Survey for Delhi Sands Flower-loving Fly (*Rhaphiomidas terminatus abdominalis*) and Other Sensitive Species on Inland Empire Composting Property, Colton, San Bernardino County, California.

Kiyani Environmental Consultants. 1995. Principal Investigator's Annual Report Delhi Sands Flower-loving fly (*Rhaphiomidas terminatus abdominalis*) Studies at Colton, California. 25+ pp.

Kiyani Environmental Consultants. 1996a. Principal Investigator's Second Annual Report Delhi Sands Flower-loving Fly (*Rhaphiomidas terminatus abdominalis*) Studies at Colton, California. Prepared for San Bernardino County and U.S. Fish and Wildlife Service, Carlsbad, California. 14+ pp.

Kiyani Environmental Consultants. 1996b. Principal Investigator's Third Annual Report Delhi Sands Flower-loving Fly (*Rhaphiomidas terminatus abdominalis*) Studies at Colton, California Fly Year 1996. Prepared for San Bernardino County and U.S. Fish and Wildlife Service, Carlsbad, California. 11+ pp.

Kiyani Environmental Consultants. 1997. Principal Investigator's Fourth Annual Report Delhi Sands Flower-loving Fly (*Rhaphiomidas terminatus abdominalis*) Studies at Colton, California Fly Year 1997. Prepared for San Bernardino County and U.S. Fish and Wildlife Service, Carlsbad, California. 24+ pp.

Larry Munsey International, (LMI) 1997. Report Of 1997 Surveys For The Delhi Sands Flower-Loving Fly On Angelus Block Company 90-Acre Parcel In The City Of Rialto San Bernardino County, California. Prepared for Hewitt & McGuire.

Michael Brandman Associates (MBA). 1995. Delhi Sands Flower-loving Fly Survey Report for the Rialto Property. Prepared for Hewitt & McGuire. 6 pp. + Appendix.

Michael Brandman Associates (MBA). 1996. Report of 1996 Surveys for the Delhi Sands Flower-loving Fly on the Angelus Block Company Property in the City of Rialto, San Bernardino County, California. Prepared for Hewitt & McGuire. 4 pp. + Appendix.

Remsen, J.V. 1978. Bird Species of Special Concern in California: An Annotated List of Declining or Vulnerable Bird Species. Non-game Wildlife Investigations. Wildlife Management Branch, California Department of Fish and Game. Administrative Report, No. 78-1.

Riggan and Associates. 1996. "Report of a Two Year Survey of an Eleven Acre Parcel for the Delhi Sands Flower-loving Fly, Rialto, California. Prepared for The Owl Companies. 9 pp. + tables and figures.

Rogers, R. and R. Mattoni. 1993. Observations on the Natural History and Conservation Biology of the Giant Flower-loving Flies, *Rhaphiomidas* (Diptera: Apioceridae). Dipt. Res. 4(1-2):21-34.

Sawyer, J. 1994. Series Descriptions of California Vegetation. California Department of Fish and Game. Sacramento, California.

Skinner, M.W., and B.M. Pavlik. 1994. *California Native Plant Society's Inventory of Rare and Endangered Vascular Plants of California*. California Native Plant Society. Special Publication, No. 1, 5th ed.

Thomas Olsen Associates Inc., 1996. Results and Analysis of the 1996 Delhi Sands Flower-loving Fly Survey for the Agua Mansa Industrial Center. Prepared for Lowe Enterprises and The Keith Companies.

Thomas Olsen Associates Inc., 1997. Initial Study Colton/San Bernardino Regional Tertiary Treatment and Water Reclamation Authority (JPA) Infiltration Rate, Enhancement Project, Colton, California. Prepared for Colton/San Bernardino JPA.

Tierra Madre Consultants, 1997. Focused Surveys for the Delhi Sands Flower-loving Fly. Prepared for Santa Fe Pacific Pipeline Partners L.P. for Submittal to U.S. Fish and Wildlife Service.

U.S. Department of Agriculture, Soil Conservation Service (USDA). 1971. Soil Survey: Riverside County. U.S. Govt. Printing Office, Washington, D.C.

U.S. Department of Agriculture, Soil Conservation Service (USDA). 1980. Soil Survey of San Bernardino County Southwestern Part, California.

U.S. Fish and Wildlife Service (USFWS). 1993. Endangered and Threatened Wildlife and Plants; Determination of Endangered Status for the Delhi Sands Flower-loving Fly. U.S. Department of the Interior. *Fed. Reg.* 58(183): 49881-49887.

U.S. Fish and Wildlife Service, 1994a. Letter to Mr. Leon Long, West San Bernardino County Water District, dated November 4, 1994.

U.S. Fish and Wildlife Service 1994b. Endangered and Threatened Wildlife and Plants; Animal Candidate Review for Listing as Endangered or Threatened Species. Federal Register 50 CFR Part 17. U.S. Department of the Interior. Washington, D.C.

U.S. Fish and Wildlife Service. 1995 (July). Delhi Sands Flower-loving fly (*Rhaphiomidas terminatus abdominalis*; DSF) Draft Presence/ Absence Survey Guidelines.

U.S. Fish and Wildlife Service, 1996a. Letter to G.W. Singletary, dated September 17, 1996.

U.S. Fish and Wildlife Service (USFWS). 1996b. Interim General Survey Guidelines for the Delhi Sands Flower-loving Fly. 4 pp.

U.S. Fish and Wildlife Service (USFWS), 1996c. Intra-Service Section 7 Consultation on Entering into a Memorandum of Understanding between the U.S. Fish and Wildlife Service and Agua Mansa Industrial Growth Association (1-6-97-F-12). U.S. Fish and Wildlife Service, Carlsbad, California.

U.S. Fish and Wildlife Service (USFWS). 1996d. U.S. Listed Vertebrate Animal Species Index By Lead Region and Status as of September 30, 1996.

U.S. Fish and Wildlife Service (USFWS). 1997. Delhi Sands Flower-loving Fly (*Rhaphiomidas terminatus abdominalis*) Recovery Plan. U.S. Fish and Wildlife Service, Portland, OR. 51pp.

Williams, D.F. 1986. Mammalian Species of Special Concern in California. Non-game Wildlife Investigations, Wildlife Management Branch, California Department of Fish and Game. Administrative Report, No. 86-1.

Woulfe, Mary Beth, U.S. Fish and Wildlife Service. Telephone Conversation June 24, 1999.

Appendix B

Air Quality and GHG Analysis

Appendix B
Air Quality and Greenhouse Gas Analysis

Prepared For:

ANGELUS BLOCK CO INC.
3435 S Riverside Ave
Rialto, CA 91316

3777 Long Beach Blvd, Annex Bldg
Long Beach, CA 90807

AGLS-20-9598

TABLE OF CONTENTS

LIST OF TABLES

ATTACHMENTS

1.0 INTRODUCTION

This appendix describes the methods and assumptions used to estimate air pollutant emissions generated from construction and operation of the proposed Angelus Block (Angelus) concrete block manufacturing facility located in Rialto, California. This appendix includes a description of the methodologies and sources used to develop emission factors and formulas used to estimate emissions, summarizes control measure assumptions utilized in the calculations, and summarizes emissions from the various source types. Detailed emission calculation tables are provided as Attachment A to this Appendix.

2.0 EMISSIONS CALCULATIONS

Emissions associated with construction and operation of the Proposed Project were estimated using emission factors and methodology from documents and emission models from various agencies including but not limited to the United States Environmental Protection Agency (USEPA), California Air Resources Board (CARB), the California Air Pollution Control Officers Association (CAPCOA), and the South Coast Air Quality Management District (SCAQMD). The following sections describe the formulas and assumptions used to estimate emissions for each source type.

Emissions estimations include reactive organic gases (ROG), oxides of nitrogen (NOx), oxides of sulfur (SOx), carbon monoxide (CO), particulate matter with aerodynamic diameter of 10 microns or less (PM10), particulate matter with aerodynamic diameter of 2.5 microns or less (PM2.5), carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), and toxic air contaminants (TACs).

2.1 CONSTRUCTION

Construction of the Proposed Project is expected to take approximately 18 months to complete. Construction is expected to occur from September 2020 until March 2022. Construction tasks will include site preparation, grading, building construction, and paving. There are no existing structures on the Project Site, therefore, demolition will not be required. The entire site will be graded and repaved using pervious interlocking pavers. Approximately 10,000 cubic yards of material is expected to be imported or exported during grading. Five structures are going to be built on the project site for manufacturing, industrial, storage, and administrative purposes.

Emissions generated from construction of the Proposed Project were estimated using the CAPCOA California Emissions Estimator Model (CalEEMod). Land use for the Proposed Project is assumed to be a mix of general heavy industry, general office building, and parking lot. The following land use parameters were used as the basis for CalEEMod:

Table 1: CalEEMod Land Use Parameters

Parameter	Value
Land Use 1	General Heavy Industry, 135,580 square feet
Land Use 2	Parking Lot, 42,550 square feet
Land Use 2	General Office Building, 10,018 square feet

Project specifics, such as construction schedule and equipment, were utilized as CalEEMod inputs where available. Default inputs were utilized where site-specific details are not available. CalEEMod generates emission estimates in terms of tons per year (tpy) for each phase of construction. The CalEEMod report, which contains detailed information on input data, and a summary table are provided as Attachment B to this appendix. Unmitigated construction emissions are summarized in the following tables.

Table 2: Total Daily Construction Emissions - Criteria Pollutant Summary

	CO	VOC	NO_X	SO_X	PM_{10}	$PM_{2.5}$
Maximum Daily Emissions (lb/day)	23.01	57.40	46.52	0.05	10.79	6.63
SCAQMD Significance Thresholds (lb/day)	550.00	75.00	100.00	150.00	150.00	55.00
Exceedance?	No	No	No	No	No	No

Lb/day = pounds per day

Table 3: Onsite Daily Construction Emissions - Criteria Pollutant Summary

	CO	VOC	NO_X	SO_X	PM_{10}	$PM_{2.5}$
Maximum Onsite Daily Emissions (lb/day)	21.52	57.34	42.42	0.04	10.33	6.49
SCAQMD LST Mass Thresholds (lb/day)*	4,142.00	N/A	378.00	N/A	65.00	17.00
Exceedance?	No	N/A	No	N/A	No	No

** SRA 34, 100m from receptor*

Table 4: Construction Emissions – Greenhouse Gas (GHG) Summary

Pollutant	Emissions (mtpy)
Carbon Dioxide Equivalent (CO2e)	814

mtpy = metric tonnes per year

Table 5: Construction Emissions - Toxic Air Contaminant (TAC) Summary - Unmitigated

Pollutant	On-Site (tpy)	Off-Site (tpy)	Total (tpy)
Diesel PM (DPM)*	0.227	0.003	0.230

*: All exhaust PM_{10} assumed to be DPM

As discussed in the Health Risk Assessment presented as Appendix C of the CEQA IS, without mitigation, increased cancer risk at the MEIR is above the 10 in one million significance threshold. A mitigation measure to utilize Tier 4 construction equipment would reduce impacts to less-than-significant levels. Mitigated DPM are summarized in the table below.

Table 6: Construction Emissions - Toxic Air Contaminant (TAC) Summary - Mitigated

Pollutant	On-Site (tpy)	Off-Site (tpy)	Total (tpy)
Diesel PM (DPM)*	0.009	0.003	0.012

*: All exhaust PM_{10} assumed to be DPM

2.2 OPERATIONS

Operation of the Project will generate emissions from sources including block manufacturing processes, cement and fly ash storage, on-site diesel storage, trucks, employee vehicles, and off-road equipment. Emissions will be generated on- and off-site from combustion as well as fugitive sources. Emissions were estimated using published methodology and emission factors from agencies such as SCAQMD, CARB, CAPCOA, and USEPA. Project-specific information were used as input parameters where available. The following sections detail the methodology, emission factors, and assumptions used to estimate operational emissions from each source type.

2.2.1 Concrete Block Manufacturing

Main Plant

The primary industrial activity, concrete block manufacturing, will take place in the Manufacturing Building. The Manufacturing Building contains two identical but mirrored plants. Each block plant has a separate set of drive-over raw material hoppers. Trucks drive over the steel grate and unload material, including sand, gravel, and cinder into the hoppers. Each Plant contains two process lines. Each Line contains a separate block manufacturing process, which consists of batching, mixing, block formation, and curing chamber. The heat for curing chambers is provided by one natural gas burner with a total heat input capacity up to 3 million British thermal units per hour (MMBtu/hr). Emission factors for each process were obtained from SCAQMD defaults or the corresponding chapter of USEPA Compilation of Air Pollutant Emission Factors (AP-42).

Recycle Plant

A Recycle Plant currently exists at the Project Site and is permitted under SCAQMD PTO F92562. Off-spec material is transferred to the Recycle Plant using a front-end loader. The material is processed through a crusher and a screen and conveyed onto the stockpile for potential reuse. The Recycle Plant is permitted to process up to 786,000 tons per year of material. The Recycle Plant may be removed from the Project Site once the Proposed Project is operational. However, emissions from the Recycle Plant are included in this analysis to be conservative. The Proposed Project will not increase the throughput of the Recycle Plant or operation hours of the loader. Therefore, the Proposed Project will not increase emissions from the Recycle Plant.

Table 7: Block Manufacturing Daily Emissions (lb/day)

	CO	VOC	NO_X	SO_X	PM_{10}	$PM_{2.5}$
Main Plant	--	--	--	--	0.81	0.23
Recycle Plant*	--	--	--	--	7.53	1.14
Block Aging	--	--	--	--	1.49	0.28
NG Combustion	2.45	0.49	2.59	0.04	0.53	0.53
Total	0.45	0.09	0.47	0.01	1.62	0.35

** Existing emissions.*

Table 8: Block Manufacturing Annual Emissions (tpy)

	CO	VOC	NO_X	SO_X	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O
Main Plant	--	--	--	--	0.12	0.03	--	--	--
Recycle Plant*	--	--	--	--	1.17	0.18	--	--	--
Block Aging	--	--	--	--	0.22	0.04	--	--	--
NG Combustion	0.45	0.09	0.47	0.01	0.10	0.10	1,534.37	0.03	0.00
Total	0.45	0.09	0.47	0.01	1.62	0.35	1,534.37	0.03	0.00

** Existing emissions.*

2.2.2 Cement and Fly Ash Storage

In order to store cement and fly ash, the Project Site will include a total of eight silos. Each silo will be equipped with a bin vent to reduce emissions. Emission factors for silo loading process were obtained from USEPA AP-42. The emissions from loading the cement and fly ash silos are summarized in the tables below.

Table 9: Silo Loading Daily Emissions (lb/day)

	PM_{10}	$PM_{2.5}$
Cement Silos	0.09	0.07
Fly ash Silos	0.62	0.47
Total	0.70	0.53

Table 10: Silo Loading Annual Emissions (tpy)

	PM_{10}	$PM_{2.5}$
Cement Silos	0.01	0.01
Fly ash Silos	0.10	0.07
Total	0.11	0.08

2.2.3 Diesel Storage

The Project Site will include one ~4,000-gallon diesel aboveground storage tank (AST) with one fuel dispenser. The throughput of the AST is expected to be less than or equal to 120,000 gallons of diesel fuel per year. Volatile Organic Compound (VOC) emissions due to standing loss and working loss of the AST were calculated based on SCAQMD Supplemental Instructions for Liquid Organic Storage Tanks and are summarized in the table below.

Table 11: Diesel Storage Emissions

	VOC
Daily Emissions (lb/day)	0.010
Annual Emissions (tpy)	0.002

2.2.4 Trucks

The Project will result in up to 78,000 truck trips per year. Approximately 20 trucks visit the site per day as part of the existing Recycle Plant. Therefore, 6,240 truck trips per year were assumed to be existing emissions. Trucks generate emissions in multiple ways, including running exhaust, idling exhaust, brake and tire wear, and fugitive dust. Emissions were calculated separately for on-site and off-site truck operations.

On-Site Trucks

The general methodology for calculating emissions from truck movement follows the following formula:

E = EF * Activity * C, where:

E = emissions per vessel engine (tpy)

EF = emission factor (g/mile or g/vehicle)

Activity = Vehicle miles traveled (VMT) per year or vehicles per year

C = Conversion Factor (grams to tons)

Exhaust emission factors for trucks in motion (running), brake and tire wear, and idling were derived from CARB's EMFAC2017 Web Database (CARB, 2019d). Fugitive dust emissions were derived from CARB's Miscellaneous Process Methodology 79, Entrained Road Travel, Paved Road Dust (CARB, 2018). Each truck will travel up to 0.6 miles on-site per trip. On-site truck emissions are summarized in the tables below.

Table 12: On-Site Truck Daily Emissions (lb/day)

	CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$
Exhaust – Running	0.35	0.09	2.33	0.01	0.01	0.01
Exhaust – Idling	2.39	0.14	3.90	0.01	0.01	0.01
Brake and Tire Wear	--	--	--	--	0.04	0.02
Fugitive Dust	--	--	--	--	2.87	0.70

Table 13: On-Site Truck Annual Emissions (tpy)

	CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O
Exhaust – Running	0.05	0.01	0.36	0.00	0.00	0.00	110.70	0.00	0.02
Exhaust – Idling	0.37	0.02	0.61	0.00	0.00	0.00	89.38	0.00	0.00
Brake and Tire Wear	--	--	--	--	0.01	0.00	--	--	--
Fugitive Dust	--	--	--	--	0.45	0.11	--	--	--

Off-Site Trucks

Emissions calculation methodology for off-site truck operations is similar to on-site truck operations. Emission factors were derived from the same sources, and calculation formulas are the same. The

CalEEMod default average truck trip distance of 20 miles per round trip was utilized. Off-site truck emissions are summarized in the tables below.

Table 14: Off-Site Truck Daily Emissions (lb/day)

	CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$
Exhaust	3.09	0.70	29.99	0.13	0.36	0.35
Brake and Tire Wear	--	--	--	--	1.25	0.48
Fugitive Dust	--	--	--	--	11.24	2.76

Table 15: Off-Site Truck Annual Emissions (tpy)

	CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O
Exhaust	0.48	0.11	4.68	0.02	0.06	0.05	1,810.91	0.01	0.33
Brake and Tire Wear	--	--	--	--	0.20	0.08	--	--	--
Fugitive Dust	--	--	--	--	1.75	0.43	--	--	--

2.2.5 Employee Commute

Employees commuting to the Project site will generate exhaust, brake and tire wear, and fugitive dust emissions. Methodology for calculating employee commute emissions is similar to the methodology employed for on-site and off-site trucks. Exhaust and brake and tire wear emission factors were obtained from the CARB EMFAC2017 Web Database, and fugitive dust emission factors were derived from CARB's Paved Road Dust Methodology. Angelus expects to employ up to 150 full-time employees. The CalEEMod default average employee trip distance of 16.6 miles per round trip was utilized. Employee commute emissions are summarized in the tables below.

Table 16: Employee Commute Daily Emissions (lb/day)

	CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$
Exhaust	4.21	0.07	0.26	0.02	0.01	0.01
Brake and Tire Wear	--	--	--	--	0.25	0.10
Fugitive Dust	--	--	--	--	0.54	0.13

Table 17: Employee Commute Annual Emissions (tpy)

	CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O
Exhaust	0.66	0.01	0.04	0.00	0.00	0.00	236.15	0.00	0.00
Brake and Tire Wear	--	--	--	--	0.04	0.02	--	--	--
Fugitive Dust	--	--	--	--	0.08	0.02	--	--	--

2.2.6 Off-Road Equipment

The Project will utilize up to twelve forklifts, one front-end loader and up to three portable engines. The front-end loader is currently operating at the Recycle Plant. Therefore, the emissions from the front-end loader are considered existing emissions.

The general methodology for calculating emissions from off-road equipment follows the following formula:

E = EF * Activity * LF * EP * C, where:

E = emissions per equipment (tpy)

EF = emission factor (g/hp-hr)

Activity = hours per day or year

LF = Load Factor (%)

EP = Engine Power (hp)

C = Conversion Factor (grams to tons)

Criteria pollutant emission factors, GHG emission factors, and equipment load factors were obtained using CARB Off-road Emissions Model. The expected annual activity and emission for each equipment type are summarized in the tables below.

Table 18: Off-Road Equipment Daily Emissions (lb/day)

Equipment	CO	VOC	NO_X	SO_X	PM_{10}	$PM_{2.5}$
Forklift x 12	35.03	3.37	31.44	0.05	2.07	1.90
Loader x 1*	4.81	0.20	0.41	0.01	0.02	0.02
Portable Engine x 3	5.87	0.50	4.28	0.01	0.18	0.16
Total	45.70	4.07	36.13	0.06	2.26	2.08

** Existing emissions*

Table 19: Off-Road Equipment Emissions (tpy)

Equipment	CO	VOC	NO_X	SO_X	PM_{10}	$PM_{2.5}$	CO_2	CH_4
Forklift x 12	5.46	0.53	4.91	0.01	0.32	0.30	787.02	0.43
Loader x 1*	0.78	0.03	0.07	0.00	0.00	0.00	122.12	0.03
Portable Engine x 3	0.30	0.03	0.22	0.00	0.01	0.01	31.41	0.02
Total	6.55	0.58	5.19	0.01	0.33	0.31	940.55	0.48

** Existing emissions*

2.2.7 Criteria Pollutant Operations Summary

Operational emissions from the Proposed Project in terms of pounds per day and tons per year are summarized in the tables below. A comparison to SCAQMD Significance thresholds is also included in each table where applicable.

Table 20: Unmitigated Criteria Pollutant Operational Emissions Summary (lb/day)

	CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$	Lead
Block Manufacturing	2.45	0.49	2.59	0.04	10.36	2.17	--
Cement and Fly Ash Storage	--	--	--	--	0.70	0.53	3.55E-05
Diesel Storage	--	0.01	--	--	--	--	--
Trucks	5.82	0.93	36.23	0.14	15.78	4.33	--
Employee Commute	4.20	0.07	0.25	0.01	0.79	0.24	--
Off-Road Equipment	45.70	4.07	36.13	0.06	2.26	2.08	--
Proposed Project Total	58.18	5.57	75.20	0.26	29.89	9.34	3.55E-05
Existing Emissions	5.28	0.27	3.31	0.02	1.32	0.36	--
Net Increase	52.90	5.30	71.89	0.24	28.57	8.98	3.55E-05
SCAQMD Threshold	550.00	55.00	55.00	150.00	150.00	55.00	3.00
Exceedance?	No	No	**Yes**	No	No	No	No

Table 21: Unmitigated Criteria Pollutant Operational Annual Emissions Summary (tpy)

	CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$	Lead
Block Manufacturing	0.45	0.09	0.47	0.01	1.62	0.35	--
Cement and Fly Ash Storage	--	--	--	--	0.11	0.08	5.54E-06
Diesel Storage	--	>0.01	--	--	--	--	--
Trucks	0.91	0.14	5.65	0.02	2.46	0.67	--
Employee Commute	0.66	0.01	0.04	>0.01	0.12	0.04	--
Off-Road Equipment	6.55	0.58	5.19	0.01	0.33	0.31	--
Proposed Project Total	8.56	0.83	11.36	0.04	4.64	1.45	5.54E-06
Existing Emissions	0.85	0.04	0.52	>0.01	0.20	0.06	--
Net Increase	7.71	0.79	10.84	0.04	4.44	1.40	5.54E-06

As shown in Table 20, daily emissions of NOx from the Proposed Project would exceed the SCAQMD significance threshold. In order to mitigate this exceedance and reduce NOx emissions, Angelus proposed to purchase forklifts and portable diesel equipment that meet or exceed Tier 4 Final emission standards. Mitigated emissions are summarized in the tables below.

Table 22: Mitigated Criteria Pollutant Operational Emissions Summary (lb/day)

	CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$	Lead
Unmitigated Emissions	58.18	5.57	75.20	0.26	29.89	9.34	3.55E-05
Benefits from Mitigation	0.98	2.15	29.51	0.00	2.08	1.90	--
Existing Emissions	5.28	0.27	3.31	0.02	1.32	0.36	--
Net Increase	51.92	3.15	42.38	0.24	26.49	7.08	3.55E-05
AQMD Threshold	550.00	55.00	55.00	150.00	150.00	55.00	3.00
Exceedance?	No	No	No	No	No	No	No

SCAQMD has additional significance thresholds for new projects called Localized Significance Thresholds (LSTs). LSTs compare onsite emissions to mass rate thresholds that depend on geographical location and distance to the nearest receptor. The nearest residential receptor is located approximate 150 meters to the east of the Project Site, and the Project Site is located in Source Receptor Area (SRA) 34. LSTs are generally only applicable for projects with areas of 5 acres or less. However, comparing emissions from the Proposed Project to the 5-acre LSTs is conservative as emissions from the Proposed Project would be more spread out throughout the facility compared to a 5-acre site. The Proposed Project's onsite emissions and a comparison to applicable LSTs are summarized in the following table.

Table 23: Mitigated Operational Emissions LST Summary (lb/day)

	CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$	Lead
Unmitigated Onsite Emissions	50.89	4.80	44.96	0.11	16.24	5.52	3.55E-05
Benefits from Mitigation	0.98	2.15	29.51	0.00	2.08	1.90	--
Existing Emissions	5.03	0.22	0.91	0.01	0.25	0.08	--
Net Increase (Onsite)	44.88	2.44	14.54	0.11	13.91	3.54	3.55E-05
AQMD LST	4,142	N/A	378	N/A	16.00	5.00	N/A
Exceedance?	No	No	No	No	No	No*	No

** No exceedance after mitigation*

3.0 GREENHOUSE GAS EMISSIONS

GHG emissions are commonly expressed in metric tonnes of CO2e. Emissions presented in Section 2 are in terms of tons per year of individual pollutants. CO2e is calculated by summing the products of each pollutant multiplied by each pollutant's respective Global Warming Potential (GWP). The GWPs for CO2, CH4, and N2O are 1, 25, and 298, respectively (USEPA, 2018). Project GHG emissions in terms of CO_2e are summarized in the following table:

Table 24: GHG Emissions Summary (After Mitigation)

Source	CO_2 (tpy)	CH_4 (tpy)	N_2O (tpy)	CO_{2eq} (mtpy)
Block Manufacturing	1,534.37	0.03	0.00	1,393.40
Trucks	2,010.99	0.01	0.35	1,919.25
Employee Commute	236.15	0.00	0.00	215.48
Off-Road Equipment	940.55	0.48	0.00	864.21
Electricity Usage	494.11	0.03	0.00	449.97
Total	5,216.17	0.55	0.36	4,842.32
Significance Threshold	--	--	--	10,000.00
Exceedance?	--	--	--	No

mtpy = metric tonnes per year
1 ton = 0.9072 metric tonne

4.0 TOXIC AIR CONTAMINANTS

The Project is expected to generate Diesel Particulate Matter (DPM), as well as other organic TACs. DPM will be generated from diesel-fueled combustion sources including trucks, off-road equipment, and a small portion of employee vehicles

All PM_{10} generated by combustion of diesel fuel was considered DPM. Expected DPM emissions from the Project are summarized in the following table.

Table 25: Diesel Particulate Matter Emissions Summary

Source	DPM (tpy)
Off-Road Equipment	0.335
On-Site Trucks	0.003
Off-Site Trucks	0.057
Employee Commute	< 0.001
Total	0.394

After mitigation, DPM emissions from off-road equipment will be reduced to approximately 0.026 tons per year, and total DPM emissions will be reduced to approximately 0.086 tons per year.

In addition to DPM, organic TAC emissions are expected due to natural gas combustion during the block manufacturing process, and inorganic TACs will be generated during the cement and fly ash silo loading process. TAC emissions from these sources are summarized in the following tables.

Table 26: TAC Emissions – Natural Gas Burner (tpy)

Pollutant	Emissions (tpy)
Benzene	1.02E-04
Formaldehyde	2.17E-04
PAHs (except Naphthalene)	1.28E-06
Naphthalene	3.83E-06
Acetaldehyde	5.50E-05
Acrolein	3.45E-05
Ammonia	4.09E-02
Ethyl Benzene	1.21E-04
Hexane	8.05E-05
Toluene	4.68E-04
Xylene	3.48E-04

Table 27: TAC Emissions – Cement Silo Loading (tpy)

Pollutant	Emissions (tpy)
Arsenic	1.67E-07
Beryllium	1.91E-08
Cadmium	1.84E-07
Total Chromium	1.14E-06
Lead	4.29E-07
Manganese	4.60E-06
Nickel	1.64E-06
Total Phosphorus	9.28E-06

Table 28: TAC Emissions – Fly Ash Silo Loading (tpy)

Pollutant	Emissions (tpy)
Arsenic	9.87E-06
Beryllium	8.88E-07
Cadmium	1.95E-07
Total Chromium	1.20E-05
Lead	5.11E-06
Manganese	2.52E-06
Nickel	2.24E-05
Total Phosphorus	3.48E-05
Selenium	7.12E-07

Attachment A

Emission Calculation Tables

Attachment B

CalEEMod Report and Summary Table

Delivering Solutions
Improving Lives

Appendix C

Health Risk Assessment

Appendix C
Health Risk Assessment

Prepared For:

ANGELUS BLOCK CO INC.
3435 S Riverside Ave
Rialto, CA 91316

N|V|5

3777 Long Beach Blvd, Annex Bldg
Long Beach, CA 90807

AGLS-20-9598

TABLE OF CONTENTS

TABLES

TABLES WITHIN TEXT

TABLES PROVIDED SEPARATELY FOLLOWING THE TEXT

FIGURES

LIST OF ACRONYMS

ADMRT	Air Dispersion Modeling and Risk Tool
CA	California
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CEQA	California Environmental Quality Act
DPM	Diesel Particulate Matter
FONT	Fontana Weather Station
GLC	Ground Level Concentration
HARP	Hot Spots Analysis and Reporting Program
HI	Hazard Index
hr	hour
HRA	Health Risk Assessment
lb	pound
lb/hr	pound per hour
lb/yr	pound per year
IS	Initial Study
m	meters
MEIR	Maximum Exposed Individual Resident
MEIW	Maximum Exposed Individual Worker
NED	National Elevation Dataset
OEHHA	Office of Environmental Health Hazard Assessments
REL	Reference Exposure Level
SCAQMD	South Coast Air Quality Management District
TACs	Toxic Air Contaminants
USEPA	United States Environmental Protection Agency
UTM	Universal Transverse Mercator
WGS	World Geodetic System

1.0 INTRODUCTION

1.1 PURPOSE

The purpose of this document is to evaluate local community risk and hazard impacts for the proposed Angelus Block concrete block manufacturing facility (Proposed Project) located in Rialto, California. This document provides details on the analysis performed to assess the potential risks associated with Toxic Air Contaminants (TACs) emitted during the construction and operation of the Proposed Project. This document is Appendix C to the California Environmental Quality Act Initial Study (CEQA IS) document prepared for the Proposed Project.

1.2 PROJECT SETTING

1.2.1 Project Location

The Proposed Project will occupy approximately 29.5 acres of land located at the terminus of Fortuna Way approximately 700 feet east of Riverside Avenue, which will be further referred to as the "Project Site." The surrounding area is predominantly industrial, commercial, and vacant land zoned for industrial use. The Agua Mansa Pioneer Cemetery is adjacent to the Project Site to the southeast. The Project Site is approximately 2 miles south of Interstate 10 ("I-10") and approximately 3.5 miles north, northwest of the junction of California State Routes 60 ("CA-60") and 91 ("CA-91"). The nearest residential community is located approximately two-thirds of a mile to the northwest of the Project Site. However, there is one home located on Agua Mansa Road approximately 500 feet east of the Project Site. The nearest school, Crestmore Elementary at 18870 Jurupa Ave, Bloomington, CA, is located approximately 1.6 miles to the west of the Project Site.

1.2.2 Construction Activities

Construction activities will include site preparation, grading, building construction, and paving. Construction of the Proposed Project is expected to commence on September 1st, 2020 and continue for approximately 18 months.

1.2.3 Operations

Once operational, the concrete block manufacturing process will include raw material delivery and storage; material transfer and mixing; product forming, curing, and finishing; and product storage, onsite movement, packaging, and shipment to customers.

The normal operating schedule for the Proposed Project will be 18 hours per day, 5 days per week, and 52 weeks per year, and the maximum operating schedule will be 20 hours per day, 6 days per week, and 52 weeks per year. Complete details regarding Project operations can be found in the Project Description of the Draft CEQA IS document.

2.0 RISK ASSESSMENT METHODOLOGY

2.1 EMISSIONS CALCULATIONS

Emissions associated with the operation of the Proposed Project were estimated using emission factors and methodology from documents and emission models from various agencies including but not limited to the United States Environmental Protection Agency (USEPA), the California Air Resources Board (CARB), the California Air Pollution Control Officers Association (CAPCOA), and the South Coast Air Quality Management District (SCAQMD). TAC Emissions from operations and construction are summarized in Tables 1 and 2. Detailed emission calculation methodology and tables are provided in Appendix B of the IS document.

2.2 AIR DISPERSION MODELING

2.2.1 General

Air dispersion modelling was performed to estimate ground level concentrations (GLCs) at and beyond the property boundary of the Project Site. Modelling was performed using USEPA's AERMOD executable version 19191 via the BREEZE AERMOD software. The following options were used in running the AERMOD model:

- AERMOD was executed using the urban modeling option.
- USEPA regulatory default options were implemented.
- The UTM, World Geodetic System (WGS) 1984 projection was implemented.
- The pollutant was set to "Other"
- Regulatory default concentration only, was used, and no depletion options were selected.

Air dispersion modelling results in terms of period average and maximum one-hour concentration were exported as plot (.plt) files, and separate plot files were created for each source.

2.2.2 Meteorological Data

AERMOD-ready meteorological data were obtained from SCAQMD website. Data from Fontana meteorological station were selected. Meteorological data from the FONT station are available for years 2011 through 2013 and 2015 through 2016.

2.2.3 Terrain Data

Surface elevations for the various modeling objects in the modeling domain were imported from National Elevation Dataset (NED) files developed by the United States Geological Survey (USGS). NED files are available in 1-arc second resolution. A NED file purchased from BREEZE Modeling Software was used in the air dispersion modeling.

2.2.4 Receptors

Three sets of receptors were used in the air dispersion modelling process: boundary receptors, grid receptors, and one discrete receptor. Grid receptors were set at 50-meter spacing near the facility and expanded at further distances. The discrete receptor was placed on the one residence located on Agua Mansa Road to the East of the Project Site to represent the closest residential receptor. The discrete receptor is Receptor #352. Receptor locations are provided in Table 2.

2.2.5 Risk Characterization

Air dispersion modeling results (plot files) were imported into CARB's HARP software. HARP2 ADMRT software version 19121 was utilized to perform the dose-response assessment and calculate the potential cancer risk and non-cancer health impacts for the various receptors surrounding the facility. The dose-response assessment and risk calculations were performed in accordance with OEHHA's Risk Assessment Guidelines (OEHHA, 2015).

Cancer and non-cancer health impacts may be evaluated in HARP. Cancer risk is expressed as a theoretical probability of an individual person developing cancer as a result of exposure to carcinogenic substances. Noncancer risk is expressed with a hazard index (HI) number for pollutant-targeted organ systems: the cardiovascular system, central nervous system, immune system, kidneys, gastrointestinal tract and liver, reproductive/developmental system, respiratory system, skin, eyes, skeletal system, endocrine system, hematological system, physiological response to odors, and general toxicity (CARB, 2018). Calculations built into HARP2 ADMRT are based on the dose and risk calculation methodologies and pollutant risk factors contained within the OEHHA Risk Assessment Guidelines.

According to OEHHA, dose-response assessment describes the quantitative relationship between the amount of exposure to a substance (the dose) and the incidence or occurrence of an adverse health impact (the response). Dose-response information for noncancer health effects is used to determine Reference Exposure Levels (RELs). Dose-response information for cancer risks are based on cancer potency factors (OEHHA, 2015). Chronic RELs, 8-hour Chronic RELs, Acute RELs, and cancer potency factors for each pollutant are listed in the OEHHA Guidelines and built into HARP2. These values are periodically updated, and new versions of HARP2 incorporate the changes.

Risks are characterized using calculations and methodology contained in the OEHHA Guidelines and built into HARP2. Risk is calculated based on dose, dose-response values (RELs or cancer potency factors), and exposure duration and frequency. For this HRA, all risks were calculated using a Tier 1 approach.

Carcinogenic risks are calculated for each receptor by calculating the dose of each pollutant at that receptor then following the calculation methodology in Section 8 of the OEHHA Guidelines. Multi-pathway risks are accounted for within HARP2 and follow the methodology in the guidelines.

Chronic hazards are calculated using the period average ground level concentration of each pollutant compared to the chronic REL for each pollutant. The sum of the HIs for each pollutant is the total chronic HI for each receptor.

Acute non-cancer hazards are identical for residential and non-residential (worker) receptors. Therefore, only one set of methodology was utilized for acute non-cancer hazard index calculation. Acute hazards are calculated using the maximum 1-hour ground level concentration of each pollutant compared to the acute REL for each pollutant. The sum of the HIs for each pollutant is the total acute HI.

3.0 CONSTRUCTION

3.1 SOURCES

The sources of TAC emissions during construction at the Facility include off-road equipment used on-site during different phases of construction, as well as trucks used to transport material to and from the site. In order to reduce the impact of the risk-driving pollutant, Diesel exhaust PM, Angelus is expected to utilize construction equipment that meet or exceed Tier 4 Final emission standards.

3.2 EMISSIONS

Source parameters, such as name, location, release height, etc. are provided in Table 4. Annual emissions in pounds per year (lb/yr) for each source are provided in Table 5. Total construction emissions in lb/yr and lb/hr are summarized in Table 2.

3.3 EXPOSURE ASSESSMENT

3.3.1 Exposure Pathways

3.3.1.1 Residents

The following residential exposure pathways were included in this HRA:

- Inhalation
- Soil Ingestion
- Dermal Absorption
- Mother's Milk
- Home Grown Produce

3.3.1.2 Off-Site Workers

The following worker exposure pathways were included in this HRA:

- Inhalation
- Soil Ingestion
- Dermal Absorption

3.3.2 HARP Exposure Analysis and Assumptions

According to the OEHHA guidelines, different exposure scenarios should be used for residential and worker receptors. Exposure scenarios and assumptions for residential and worker receptors are summarized below.

3.3.2.1 Residents

Construction is expected to take approximately 18 months to complete. Therefore, a two-year exposure scenario is used to estimate risk from construction emissions. The following additional parameters were selected in HARP:

- Receptor Type: Individual Resident
- Intake Rate Percentile:
  - RMP using the Derived Method for Cancer
  - OEHHA Derived Method for Non-Cancer
- Exposure Frequency: 350 days per year
- Deposition Rate: 0.05 meters per second

3.3.2.2 Off-Site Workers

A two-year exposure scenario is used to estimate risk from construction emissions. The following additional parameters were selected in HARP:

- Receptor Type: Worker
- Intake Rate Percentile: OEHHA Derived Method
- Exposure Frequency: 250 days per year
- Deposition Rate: 0.05 meters per second

3.4 RESULTS

3.4.1 Cancer Risks

The following table summarizes the potential cancer risks from construction emissions for the Maximum Exposed Individual Resident (MEIR) and Maximum Exposed Individual Worker (MEIW). The location of the MEIR and MEIW are presented in Figure 1.

Receptor	UTM X (m)	UTM Y (m)	Cancer Risk
MEIR	466680	3767110	27.8 in a million
MEIW	466170	3767030	6.8 in a million

Diesel exhaust PM (DPM) is the risk-driving pollutant. As shown in the table above, cancer risk at the MEIR is above 10 in one million without mitigation. Angelus proposes a mitigation measure to utilize Tier 4 construction equipment to reduce DPM emissions during construction. Mitigated cancer risks from construction are summarized in the table below.

Receptor	UTM X (m)	UTM Y (m)	Cancer Risk
MEIR	466680	3767110	1.15 in a million
MEIW	466170	3767030	0.03 in a million

3.4.2 Non-Cancer Chronic Health Index

The following table summarizes the potential non-cancer chronic HI at the MEIR and MEIW.

Receptor	UTM X (m)	UTM Y (m)	Non-Cancer Chronic HI	Target Organ
MEIR	466680	3767110	0.02	RESP
MEIW	466170	3767030	0.03	RESP

3.4.3 Non-Cancer Acute Health Index

The only TAC emitted during construction, is Diesel exhaust PM, which does not cause acute health risk to residential or worker receptors.

4.0 OPERATION

4.1 SOURCES

The sources of TAC emissions during operation at the Facility include off-road equipment used on-site, trucks, cement and fly ash silo loading and natural gas combustion. In order to mitigate impacts associated with the emission of oxides of nitrogen (NO_X), and to bring daily NO_X emissions below CEQA threshold levels, Angelus has proposed the mitigation measure to utilize forklifts and portable generators that meet or exceed Tier 4 Final emission standards. The proposed mitigation measure will have co-benefits including significant reduction in DPM emissions at the Project Site. The following analysis is based on emissions after mitigation.

4.2 EMISSIONS

Source parameters, such as name, location, release height, etc. are provided in Table 6. Annual emissions in pounds per year (lb/yr) for each source are provided in Table 7. Total facility-wide TAC emissions in lb/yr and lb/hr are summarized in Table 1.

4.3 EXPOSURE ASSESSMENT

4.3.1 Exposure Pathways

4.3.1.1 Residents

The following residential exposure pathways were included in this HRA:

- Inhalation
- Soil Ingestion
- Dermal Absorption
- Mother's Milk
- Home Grown Produce

4.3.1.2 Off-Site Workers

The following worker exposure pathways were included in this HRA:

- Inhalation
- Soil Ingestion
- Dermal Absorption

4.3.2 HARP Exposure Analysis and Assumptions

According to the OEHHA guidelines, different exposure scenarios should be used for residential and worker receptors. Exposure scenarios and assumptions for residential and worker receptors are summarized below.

4.3.2.1 Residents

A 30-year exposure scenario is used for residential receptors to estimate cancer and chronic non-cancer risk from operation emissions. The following additional parameters were selected in HARP:

- Receptor Type: Individual Resident
- Intake Rate Percentile:
  - RMP using the Derived Method for Cancer
  - OEHHA Derived Method for Non-Cancer
- Exposure Frequency: 350 days per year
- Deposition Rate: 0.02 meters per second

4.3.2.2 Off-Site Workers

A 25-year exposure scenario starting at the age of 16 is used for off-site worker receptors to estimate cancer risk from operation emissions. The following additional parameters were selected in HARP:

- Receptor Type: Worker
- Intake Rate Percentile: OEHHA Derived Method (when applicable)
- Exposure Frequency: 250 days per year
- Deposition Rate: 0.02 meters per second

4.4 RESULTS

4.4.1 Cancer Risks

The following table summarizes the potential cancer risks from operational emissions after mitigation for the MEIR and MEIW.

Receptor	UTM X (m)	UTM Y (m)	Cancer Risk
MEIR	466680	3767110	9.52 in a million
MEIW	466170	3767030	1.80 in a million

Diesel exhaust PM is the risk-driving pollutant. The location of the MEIR and MEIW are presented in Figure 1.

4.4.2 Non-Cancer Chronic Health Index

The following table summarizes the potential non-cancer chronic HI at the MEIR and MEIW.

Receptor	UTM X (m)	UTM Y (m)	Non-Cancer Chronic HI	Target Organ
MEIR	466680	3767110	0.02	RESP
MEIW	466170	3767030	0.01	RESP

4.4.3 Non-Cancer Acute Health Index

The following table summarizes the potential non-cancer acute HI at the MEIR and MEIW.

Receptor	UTM X (m)	UTM Y (m)	Non-Cancer Acute HI	Target Organ
MEIR	466680	3767110	0.002	IMMUN
MEIW	466170	3767030	0.002	IMMUN

Nickel appears to drive the non-cancer acute HI, and the primary target organ systems is the immune system.

5.0 CONCLUSIONS

The proposed mitigation measure of utilizing construction equipment with Tier 4 engines, will significantly reduce DPM emissions due to construction activities at the Project Site. After mitigation, cancer risk associated with construction activities, is expected to be below 10 in one million, and non-cancer health effects are expected to be below 1.0 for the MEIR and MEIW.

Similarly, for the operation of the Proposed Project, the proposed mitigation measure of utilizing forklifts and portable generators with Tier 4 Final engines will result in the reduction of daily NOx emissions to levels below SCAQMD CEQA threshold. This mitigation measure will also result in a significant decrease of diesel exhaust emissions at the Project Site as well as reduced cancer and non-cancer risk levels. After mitigation, cancer risks associated with emissions generated due to the operation of the Proposed Project are below 10 in one million and non-cancer HIs are below 1.0 for the MEIR and MEIW.

6.0 REFERENCES

1. California Air Resources Board (CARB), 2018. Hotspots Analysis and Reporting Program (HARP)." June 11. Available online at: https://www.arb.ca.gov/toxics/harp/harp.htm.

2. Office of Environmental Health Hazard Assessment (OEHHA), 2015. "Air Toxics Hot Spots Program. Risk Assessment Guidelines. Guidance Manual for Preparation of Risk Assessments." February. Available online at: https://oehha.ca.gov/air/crnr/notice-adoption-air-toxics-hot-spots-program-guidance-manual-preparation-health-risk-0.

3. South Coast Air Quality Management District (SCAQMD), 2015. "Supplemental Guidelines for Preparing Risk Assessments for the Air Toxics "Hot Spots" Information and Assessment Act." June 5. Available online at: http://www.aqmd.gov/docs/default-source/planning/risk-assessment/ab2588_guidelines.pdf?sfvrsn=2.

4. South Coast Air Quality Management District (SCAQMD), 2019. "SCAQMD Modeling Guidance for AERMOD." Available online at: www.aqmd.gov/home/air-quality/air-quality-data-studies/meteorological-data/modeling-guidance#AERMOD.

Tables

Table 1
Mitigated Operation Emissions Summary

Substance Name	CAS	Annual Average Emissions	Maximum Hourly Emissions
		lb/yr	lb/hr
Diesel Exhaust PM	9901	171.54	2.75E-02
Acetaldehyde	75070	0.11	1.76E-05
Acrolein	107028	0.07	1.11E-05
Ammonia	7664417	81.81	1.31E-02
Arsenic	7440382	0.02	3.22E-06
Benzene	71432	0.20	3.28E-05
Beryllium	7440417	< 0.01	2.91E-07
Cadmium	7440439	< 0.01	1.21E-07
Ethyl Benzene	100414	0.24	3.89E-05
Formaldehyde	50000	0.43	6.96E-05
Hexane	110543	0.16	2.58E-05
Lead	7439921	0.01	1.78E-06
Manganese	7439965	0.01	2.28E-06
Naphthalene	91203	0.01	1.23E-06
Nickel	7440020	0.05	7.71E-06
PAHs (except Naphth	1151	< 0.01	4.10E-07
Selenium	7782492	< 0.01	2.28E-07
Toluene	108883	0.94	1.50E-04
Total Chromium	7440473	0.03	4.21E-06
Total Phosphorus	7723140	0.09	1.41E-05
Xyelene	1330207	0.70	1.11E-04

Table 2A
Unmitigated Construction Emissions Summary

Substance Name	CAS	Annual Average Emissions	Maximum Hourly Emissions
		lb/yr	lb/hr
Diesel Exhaust PM	9901	460.10	1.24E-01

Table 2B
Mitigated Construction Emissions Summary

Substance Name	CAS	Annual Average Emissions	Maximum Hourly Emissions
		lb/yr	lb/hr
Diesel Exhaust PM	9901	23.86	6.41E-03

Table 3
List and Location of Receptors

HARP Rec Index	HARP Rec ID	UTM X (m)	UTM Y (m)	Residential or Non-residential
1	D1	466070	3766780	Non-residential
2	D2	466120	3766780	Non-residential
3	D3	466170	3766780	Non-residential
4	D4	466220	3766780	Non-residential
5	D5	466270	3766780	Non-residential
6	D6	466320	3766780	Non-residential
7	D7	466370	3766780	Non-residential
8	D8	466420	3766780	Non-residential
9	D9	466470	3766780	Non-residential
10	D10	466520	3766780	Non-residential
11	D11	466570	3766780	Non-residential
12	D12	466620	3766780	Non-residential
13	D13	466670	3766780	Non-residential
14	D14	466720	3766780	Non-residential
15	D15	466070	3766830	Non-residential
16	D16	466120	3766830	Non-residential
17	D17	466170	3766830	Non-residential
18	D18	466220	3766830	Non-residential
19	D19	466270	3766830	Non-residential
20	D20	466320	3766830	Non-residential
21	D21	466370	3766830	Non-residential
22	D22	466420	3766830	Non-residential
23	D23	466470	3766830	Non-residential
24	D24	466520	3766830	Non-residential
25	D25	466570	3766830	Non-residential
26	D26	466620	3766830	Non-residential
27	D27	466670	3766830	Non-residential
28	D28	466720	3766830	Non-residential
29	D29	466070	3766880	Non-residential
30	D30	466120	3766880	Non-residential
31	D31	466170	3766880	Non-residential
32	D32	466220	3766880	Non-residential
33	D33	466270	3766880	Non-residential
34	D34	466320	3766880	Non-residential
35	D35	466370	3766880	Non-residential
36	D36	466420	3766880	Non-residential
37	D37	466470	3766880	Non-residential
38	D38	466520	3766880	Non-residential
39	D39	466570	3766880	Non-residential
40	D40	466620	3766880	Non-residential
41	D41	466670	3766880	Non-residential

42	D42	466720	3766880	Non-residential
43	D43	466070	3766930	Non-residential
44	D44	466120	3766930	Non-residential
45	D45	466170	3766930	Non-residential
46	D46	466370	3766930	Non-residential
47	D47	466420	3766930	Non-residential
48	D48	466470	3766930	Non-residential
49	D49	466520	3766930	Non-residential
50	D50	466570	3766930	Non-residential
51	D51	466620	3766930	Non-residential
52	D52	466670	3766930	Non-residential
53	D53	466720	3766930	Non-residential
54	D54	466070	3766980	Non-residential
55	D55	466120	3766980	Non-residential
56	D56	466170	3766980	Non-residential
57	D57	466420	3766980	Non-residential
58	D58	466470	3766980	Non-residential
59	D59	466520	3766980	Non-residential
60	D60	466570	3766980	Non-residential
61	D61	466620	3766980	Non-residential
62	D62	466670	3766980	Non-residential
63	D63	466720	3766980	Non-residential
64	D64	466070	3767030	Non-residential
65	D65	466120	3767030	Non-residential
66	D66	466170	3767030	Non-residential
67	D67	466520	3767030	Non-residential
68	D68	466570	3767030	Non-residential
69	D69	466620	3767030	Non-residential
70	D70	466670	3767030	Non-residential
71	D71	466720	3767030	Non-residential
72	D72	466070	3767080	Non-residential
73	D73	466120	3767080	Non-residential
74	D74	466170	3767080	Non-residential
75	D75	466520	3767080	Non-residential
76	D76	466570	3767080	Non-residential
77	D77	466620	3767080	Non-residential
78	D78	466670	3767080	Non-residential
79	D79	466720	3767080	Non-residential
80	D80	466070	3767130	Non-residential
81	D81	466120	3767130	Non-residential
82	D82	466170	3767130	Non-residential
83	D83	466570	3767130	Non-residential
84	D84	466620	3767130	Non-residential
85	D85	466670	3767130	Non-residential
86	D86	466720	3767130	Non-residential
87	D87	466070	3767180	Non-residential
88	D88	466120	3767180	Non-residential

89	D89	466170	3767180	Non-residential
90	D90	466220	3767180	Non-residential
91	D91	466620	3767180	Non-residential
92	D92	466670	3767180	Non-residential
93	D93	466720	3767180	Non-residential
94	D94	466070	3767230	Non-residential
95	D95	466120	3767230	Non-residential
96	D96	466170	3767230	Non-residential
97	D97	466220	3767230	Non-residential
98	D98	466270	3767230	Non-residential
99	D99	466620	3767230	Non-residential
100	D100	466670	3767230	Non-residential
101	D101	466720	3767230	Non-residential
102	D102	466070	3767280	Non-residential
103	D103	466120	3767280	Non-residential
104	D104	466170	3767280	Non-residential
105	D105	466220	3767280	Non-residential
106	D106	466270	3767280	Non-residential
107	D107	466620	3767280	Non-residential
108	D108	466670	3767280	Non-residential
109	D109	466720	3767280	Non-residential
110	D110	466070	3767330	Non-residential
111	D111	466120	3767330	Non-residential
112	D112	466170	3767330	Non-residential
113	D113	466220	3767330	Non-residential
114	D114	466270	3767330	Non-residential
115	D115	466320	3767330	Non-residential
116	D116	466570	3767330	Non-residential
117	D117	466620	3767330	Non-residential
118	D118	466670	3767330	Non-residential
119	D119	466720	3767330	Non-residential
120	D120	466070	3767380	Non-residential
121	D121	466120	3767380	Non-residential
122	D122	466170	3767380	Non-residential
123	D123	466220	3767380	Non-residential
124	D124	466270	3767380	Non-residential
125	D125	466320	3767380	Non-residential
126	D126	466520	3767380	Non-residential
127	D127	466570	3767380	Non-residential
128	D128	466620	3767380	Non-residential
129	D129	466670	3767380	Non-residential
130	D130	466720	3767380	Non-residential
131	D131	466070	3767430	Non-residential
132	D132	466120	3767430	Non-residential
133	D133	466170	3767430	Non-residential
134	D134	466220	3767430	Non-residential
135	D135	466270	3767430	Non-residential

136	D136	466320	3767430	Non-residential
137	D137	466370	3767430	Non-residential
138	D138	466420	3767430	Non-residential
139	D139	466470	3767430	Non-residential
140	D140	466520	3767430	Non-residential
141	D141	466570	3767430	Non-residential
142	D142	466620	3767430	Non-residential
143	D143	466670	3767430	Non-residential
144	D144	466720	3767430	Non-residential
145	D145	466070	3767480	Non-residential
146	D146	466120	3767480	Non-residential
147	D147	466170	3767480	Non-residential
148	D148	466220	3767480	Non-residential
149	D149	466270	3767480	Non-residential
150	D150	466320	3767480	Non-residential
151	D151	466370	3767480	Non-residential
152	D152	466420	3767480	Non-residential
153	D153	466470	3767480	Non-residential
154	D154	466520	3767480	Non-residential
155	D155	466570	3767480	Non-residential
156	D156	466620	3767480	Non-residential
157	D157	466670	3767480	Non-residential
158	D158	466720	3767480	Non-residential
159	D159	466070	3767530	Non-residential
160	D160	466120	3767530	Non-residential
161	D161	466170	3767530	Non-residential
162	D162	466220	3767530	Non-residential
163	D163	466270	3767530	Non-residential
164	D164	466320	3767530	Non-residential
165	D165	466370	3767530	Non-residential
166	D166	466420	3767530	Non-residential
167	D167	466470	3767530	Non-residential
168	D168	466520	3767530	Non-residential
169	D169	466570	3767530	Non-residential
170	D170	466620	3767530	Non-residential
171	D171	466670	3767530	Non-residential
172	D172	466720	3767530	Non-residential
173	D173	465020	3765780	Non-residential
174	D174	465270	3765780	Non-residential
175	D175	465520	3765780	Non-residential
176	D176	465770	3765780	Non-residential
177	D177	465020	3766030	Residential
178	D178	465270	3766030	Residential
179	D179	465520	3766030	Residential
180	D180	465770	3766030	Non-residential
181	D181	465020	3766280	Residential
182	D182	465270	3766280	Non-residential

183	D183	465520	3766280	Non-residential
184	D184	465770	3766280	Non-residential
185	D185	465020	3766530	Non-residential
186	D186	465270	3766530	Non-residential
187	D187	465520	3766530	Non-residential
188	D188	465770	3766530	Non-residential
189	D189	465020	3766780	Non-residential
190	D190	465270	3766780	Non-residential
191	D191	465520	3766780	Non-residential
192	D192	465770	3766780	Non-residential
193	D193	465020	3767030	Non-residential
194	D194	465270	3767030	Non-residential
195	D195	465520	3767030	Non-residential
196	D196	465770	3767030	Non-residential
197	D197	465020	3767280	Non-residential
198	D198	465270	3767280	Non-residential
199	D199	465520	3767280	Non-residential
200	D200	465770	3767280	Non-residential
201	D201	465020	3767530	Non-residential
202	D202	465270	3767530	Non-residential
203	D203	465520	3767530	Non-residential
204	D204	465770	3767530	Non-residential
205	D205	465020	3767780	Non-residential
206	D206	465270	3767780	Non-residential
207	D207	465520	3767780	Non-residential
208	D208	465770	3767780	Non-residential
209	D209	465020	3768030	Non-residential
210	D210	465270	3768030	Non-residential
211	D211	465520	3768030	Non-residential
212	D212	465770	3768030	Non-residential
213	D213	465020	3768280	Non-residential
214	D214	465270	3768280	Non-residential
215	D215	465520	3768280	Non-residential
216	D216	465770	3768280	Non-residential
217	D217	466020	3766530	Non-residential
218	D218	466270	3766530	Non-residential
219	D219	466520	3766530	Non-residential
220	D220	466770	3766530	Non-residential
221	D221	467020	3766530	Non-residential
222	D222	466020	3765780	Non-residential
223	D223	466270	3765780	Non-residential
224	D224	466520	3765780	Non-residential
225	D225	466770	3765780	Non-residential
226	D226	467020	3765780	Non-residential
227	D227	466020	3766030	Non-residential
228	D228	466270	3766030	Non-residential
229	D229	466520	3766030	Non-residential

230	D230	466770	3766030	Non-residential
231	D231	467020	3766030	Non-residential
232	D232	466020	3766280	Non-residential
233	D233	466270	3766280	Non-residential
234	D234	466520	3766280	Non-residential
235	D235	466770	3766280	Non-residential
236	D236	467020	3766280	Non-residential
237	D237	467270	3765780	Non-residential
238	D238	467520	3765780	Non-residential
239	D239	467770	3765780	Non-residential
240	D240	467270	3766030	Non-residential
241	D241	467520	3766030	Non-residential
242	D242	467770	3766030	Non-residential
243	D243	467270	3766280	Non-residential
244	D244	467520	3766280	Non-residential
245	D245	467770	3766280	Non-residential
246	D246	467270	3766530	Non-residential
247	D247	467520	3766530	Non-residential
248	D248	467770	3766530	Non-residential
249	D249	466020	3767780	Non-residential
250	D250	466270	3767780	Non-residential
251	D251	466520	3767780	Non-residential
252	D252	466770	3767780	Non-residential
253	D253	467020	3767780	Non-residential
254	D254	467270	3767780	Non-residential
255	D255	467520	3767780	Non-residential
256	D256	467770	3767780	Non-residential
257	D257	466020	3768030	Non-residential
258	D258	466270	3768030	Non-residential
259	D259	466520	3768030	Non-residential
260	D260	466770	3768030	Non-residential
261	D261	467020	3768030	Non-residential
262	D262	467270	3768030	Non-residential
263	D263	467520	3768030	Non-residential
264	D264	467770	3768030	Non-residential
265	D265	466020	3768280	Non-residential
266	D266	466270	3768280	Non-residential
267	D267	466520	3768280	Non-residential
268	D268	466770	3768280	Non-residential
269	D269	467020	3768280	Non-residential
270	D270	467270	3768280	Non-residential
271	D271	467520	3768280	Non-residential
272	D272	467770	3768280	Non-residential
273	D273	467020	3766780	Non-residential
274	D274	467270	3766780	Non-residential
275	D275	467520	3766780	Non-residential
276	D276	467770	3766780	Non-residential

277	D277	467020	3767030	Non-residential
278	D278	467270	3767030	Non-residential
279	D279	467520	3767030	Non-residential
280	D280	467770	3767030	Non-residential
281	D281	467020	3767280	Non-residential
282	D282	467270	3767280	Non-residential
283	D283	467520	3767280	Non-residential
284	D284	467770	3767280	Non-residential
285	D285	467020	3767530	Non-residential
286	D286	467270	3767530	Non-residential
287	D287	467520	3767530	Non-residential
288	D288	467770	3767530	Non-residential
289	D289	466320	3764780	Non-residential
290	D290	466320	3763780	Non-residential
291	D291	466320	3762780	Residential
292	D292	466320	3761780	Non-residential
293	D293	467320	3761780	Residential
294	D294	468320	3761780	Non-residential
295	D295	469320	3761780	Non-residential
296	D296	470320	3761780	Non-residential
297	D297	467320	3762780	Residential
298	D298	468320	3762780	Non-residential
299	D299	469320	3762780	Non-residential
300	D300	470320	3762780	Non-residential
301	D301	467320	3763780	Non-residential
302	D302	468320	3763780	Residential
303	D303	469320	3763780	Residential
304	D304	470320	3763780	Residential
305	D305	467320	3764780	Non-residential
306	D306	468320	3764780	Non-residential
307	D307	469320	3764780	Non-residential
308	D308	470320	3764780	Residential
309	D309	462320	3761780	Residential
310	D310	463320	3761780	Residential
311	D311	464320	3761780	Non-residential
312	D312	462320	3762780	Non-residential
313	D313	463320	3762780	Non-residential
314	D314	464320	3762780	Non-residential
315	D315	462320	3763780	Non-residential
316	D316	463320	3763780	Residential
317	D317	464320	3763780	Non-residential
318	D318	462320	3764780	Non-residential
319	D319	463320	3764780	Non-residential
320	D320	464320	3764780	Non-residential
321	D321	465320	3761780	Non-residential
322	D322	465320	3762780	Residential
323	D323	465320	3763780	Non-residential

324	D324	465320	3764780	Non-residential
325	D325	462320	3769280	Non-residential
326	D326	463320	3769280	Residential
327	D327	464320	3769280	Non-residential
328	D328	465320	3769280	Non-residential
329	D329	466320	3769280	Non-residential
330	D330	467320	3769280	Non-residential
331	D331	468320	3769280	Non-residential
332	D332	469320	3769280	Residential
333	D333	470320	3769280	Non-residential
334	D334	462320	3766030	Non-residential
335	D335	463320	3766030	Residential
336	D336	464320	3766030	Non-residential
337	D337	462320	3767030	Residential
338	D338	463320	3767030	Residential
339	D339	464320	3767030	Non-residential
340	D340	462320	3768030	Residential
341	D341	463320	3768030	Non-residential
342	D342	464320	3768030	Residential
343	D343	468320	3766030	Non-residential
344	D344	469320	3766030	Non-residential
345	D345	470320	3766030	Residential
346	D346	468320	3767030	Non-residential
347	D347	469320	3767030	Non-residential
348	D348	470320	3767030	Residential
349	D349	468320	3768030	Non-residential
350	D350	469320	3768030	Non-residential
351	D351	470320	3768030	Non-residential
352	D352	466680	3767110	Residential

Table 4
Construction Source Modeling Parameters

Volume Sources

Release ID	Release Description	UTM X (m)	UTM Y (m)	Elevation	Release Height (m)	Initial Lateral Dimension (m)	Initial Vertical Dimension (m)
OFTRK1	Offsite Trucks	466196	3767091.7	939.0	3.3	3.12	0.77
OFTRK2	Offsite Trucks	466127.4	3767093.4	941.7	3.3	3.12	0.77
OFTRK3	Offsite Trucks	466044.3	3767112	940.3	3.3	3.12	0.77
OFTRK4	Offsite Trucks	466046.2	3767212	943.8	3.3	3.12	0.77
OFTRK5	Offsite Trucks	466048	3767312	950.1	3.3	3.12	0.77
OFTRK6	Offsite Trucks	466049.9	3767412	954.7	3.3	3.12	0.77
OFTRK7	Offsite Trucks	466051.7	3767512	957.1	3.3	3.12	0.77
OFTRK8	Offsite Trucks	466053.6	3767612	961.0	3.3	3.12	0.77
OFTRK9	Offsite Trucks	466045.3	3767709.9	974.0	3.3	3.12	0.77
OFTRK10	Offsite Trucks	465996.8	3767796.6	978.3	3.3	3.12	0.77
OFTRK11	Offsite Trucks	465935.7	3767875.7	982.1	3.3	3.12	0.77
OFTRK12	Offsite Trucks	465863.3	3767944.6	983.1	3.3	3.12	0.77
OFTRK13	Offsite Trucks	465826.3	3767979.8	984.6	3.3	3.12	0.77
OFTRK14	Offsite Trucks	465826.1	3768028.8	986.8	3.3	3.12	0.77
OFTRK15	Offsite Trucks	465825.8	3768128.8	993.9	3.3	3.12	0.77
OFTRK16	Offsite Trucks	465825.5	3768228.8	1002.4	3.3	3.12	0.77
OFTRK17	Offsite Trucks	465825.2	3768328.8	1005.2	3.3	3.12	0.77
OFTRK18	Offsite Trucks	465824.8	3768428.8	1001.9	3.3	3.12	0.77
OFTRK19	Offsite Trucks	465824.5	3768528.8	994.1	3.3	3.12	0.77
OFTRK20	Offsite Trucks	465824.2	3768628.8	990.6	3.3	3.12	0.77
OFTRK21	Offsite Trucks	465823.9	3768728.8	994.0	3.3	3.12	0.77
OFTRK22	Offsite Trucks	465823.5	3768828.8	998.9	3.3	3.12	0.77
OFTRK23	Offsite Trucks	465823.2	3768928.8	1004.0	3.3	3.12	0.77
OFTRK24	Offsite Trucks	465822.9	3769028.8	1008.8	3.3	3.12	0.77
OFTRK25	Offsite Trucks	465822.5	3769128.8	1013.3	3.3	3.12	0.77
OFTRK26	Offsite Trucks	465822.2	3769228.8	1017.3	3.3	3.12	0.77
OFTRK27	Offsite Trucks	465821.9	3769328.8	1022.0	3.3	3.12	0.77

OFTRK28	Offsite Trucks	465821.6	3769428.8	1031.3	3.3	3.12	0.77
OFTRK29	Offsite Trucks	465821.2	3769528.8	1053.1	3.3	3.12	0.77
OFTRK30	Offsite Trucks	465820.9	3769628.8	1068.3	3.3	3.12	0.77
OFTRK31	Offsite Trucks	465820.6	3769728.8	1052.4	3.3	3.12	0.77
OFTRK32	Offsite Trucks	465820.3	3769828.8	1064.7	3.3	3.12	0.77
OFTRK33	Offsite Trucks	465820	3769928.8	1073.0	3.3	3.12	0.77
OFTRK34	Offsite Trucks	465746.6	3769931.7	1057.6	3.3	3.12	0.77
OFTRK35	Offsite Trucks	465650.4	3769904.4	1052.2	3.3	3.12	0.77
OFTRK36	Offsite Trucks	465554.2	3769877.1	1052.3	3.3	3.12	0.77
OFTRK37	Offsite Trucks	466044	3767067.4	939.1	3.3	3.12	0.77
OFTRK38	Offsite Trucks	466040.4	3766995.6	937.0	3.3	3.12	0.77
OFTRK39	Offsite Trucks	466037.9	3766924.3	930.3	3.3	3.12	0.77
OFTRK40	Offsite Trucks	466001.2	3766904.4	927.2	3.3	3.12	0.77
OFTRK41	Offsite Trucks	466021.3	3766819.8	915.7	3.3	3.12	0.77
OFTRK42	Offsite Trucks	466044.5	3766722.5	906.6	3.3	3.12	0.77
OFTRK43	Offsite Trucks	466067.7	3766625.3	901.5	3.3	3.12	0.77
OFTRK44	Offsite Trucks	466090.8	3766528	896.9	3.3	3.12	0.77
OFTRK45	Offsite Trucks	466114	3766430.7	892.0	3.3	3.12	0.77
OFTRK46	Offsite Trucks	466137.2	3766333.4	886.6	3.3	3.12	0.77
OFTRK47	Offsite Trucks	466160.3	3766236.1	879.5	3.3	3.12	0.77
OFTRK48	Offsite Trucks	466183.5	3766138.9	869.5	3.3	3.12	0.77
OFTRK49	Offsite Trucks	466206.6	3766041.6	859.2	3.3	3.12	0.77
OFTRK50	Offsite Trucks	466229.8	3765944.3	855.5	3.3	3.12	0.77
OFTRK51	Offsite Trucks	466253	3765847	853.9	3.3	3.12	0.77
OFTRK52	Offsite Trucks	466276.1	3765749.7	852.9	3.3	3.12	0.77
OFTRK53	Offsite Trucks	466299.3	3765652.5	850.7	3.3	3.12	0.77
OFTRK54	Offsite Trucks	466322.5	3765555.2	849.7	3.3	3.12	0.77
OFTRK55	Offsite Trucks	466345.6	3765457.9	855.2	3.3	3.12	0.77
OFTRK56	Offsite Trucks	466368.8	3765360.6	863.4	3.3	3.12	0.77
OFTRK57	Offsite Trucks	466392.1	3765263.4	866.8	3.3	3.12	0.77
OFTRK58	Offsite Trucks	466415.4	3765166.1	835.7	3.3	3.12	0.77
OFTRK59	Offsite Trucks	466438.7	3765068.9	832.0	3.3	3.12	0.77
OFTRK60	Offsite Trucks	466461.9	3764971.6	829.6	3.3	3.12	0.77
OFTRK61	Offsite Trucks	466485.2	3764874.4	856.0	3.3	3.12	0.77
OFTRK62	Offsite Trucks	466508.5	3764777.1	858.5	3.3	3.12	0.77

OFTRK63	Offsite Trucks	466531.7	3764679.8	847.6	3.3	3.12	0.77
OFTRK64	Offsite Trucks	466529.8	3764580.4	841.3	3.3	3.12	0.77
OFTRK65	Offsite Trucks	466523.9	3764480.5	836.9	3.3	3.12	0.77
OFTRK66	Offsite Trucks	466518.1	3764380.7	837.2	3.3	3.12	0.77
OFTRK67	Offsite Trucks	466512.3	3764280.9	835.7	3.3	3.12	0.77
OFTRK68	Offsite Trucks	466506.5	3764181	834.2	3.3	3.12	0.77
OFTRK69	Offsite Trucks	466500.7	3764081.2	833.0	3.3	3.12	0.77
OFTRK70	Offsite Trucks	466494.9	3763981.4	831.6	3.3	3.12	0.77
OFTRK71	Offsite Trucks	466489.1	3763881.5	830.3	3.3	3.12	0.77
OFTRK72	Offsite Trucks	466483.2	3763781.7	828.3	3.3	3.12	0.77
OFTRK73	Offsite Trucks	466477.4	3763681.9	826.6	3.3	3.12	0.77
OFTRK74	Offsite Trucks	466471.6	3763582	825.5	3.3	3.12	0.77
OFTRK75	Offsite Trucks	466465.8	3763482.2	824.4	3.3	3.12	0.77
OFTRK76	Offsite Trucks	466460	3763382.4	822.4	3.3	3.12	0.77
OFTRK77	Offsite Trucks	466454.2	3763282.6	820.3	3.3	3.12	0.77
OFTRK78	Offsite Trucks	466448.3	3763182.7	818.7	3.3	3.12	0.77
OFTRK79	Offsite Trucks	466442.5	3763082.9	817.4	3.3	3.12	0.77
OFTRK80	Offsite Trucks	466436.7	3762983.1	818.5	3.3	3.12	0.77
OFTRK81	Offsite Trucks	466430.9	3762883.2	816.2	3.3	3.12	0.77
OFTRK82	Offsite Trucks	466422.9	3762783.6	814.6	3.3	3.12	0.77
OFTRK83	Offsite Trucks	466412.1	3762684.2	813.3	3.3	3.12	0.77
OFTRK84	Offsite Trucks	466401.3	3762584.8	812.1	3.3	3.12	0.77
OFTRK85	Offsite Trucks	466390.5	3762485.3	811.3	3.3	3.12	0.77
OFTRK86	Offsite Trucks	466379.6	3762385.9	810.1	3.3	3.12	0.77
OFTRK87	Offsite Trucks	466368.8	3762286.5	809.6	3.3	3.12	0.77
OFTRK88	Offsite Trucks	466358	3762187.1	810.8	3.3	3.12	0.77
OFTRK89	Offsite Trucks	466347.2	3762087.7	813.1	3.3	3.12	0.77
OFTRK90	Offsite Trucks	466336.3	3761988.3	817.4	3.3	3.12	0.77
OFTRK91	Offsite Trucks	466325.5	3761888.9	827.1	3.3	3.12	0.77
OFTRK92	Offsite Trucks	466314.7	3761789.5	829.3	3.3	3.12	0.77
ORE1	Offroad Equipment	466277.9	3766965.7	926.0	5	9.3	1.4
ORE2	Offroad Equipment	466297.9	3766965.7	930.9	5	9.3	1.4
ORE3	Offroad Equipment	466317.9	3766965.7	932.3	5	9.3	1.4
ORE4	Offroad Equipment	466257.9	3766985.7	932.3	5	9.3	1.4
ORE5	Offroad Equipment	466277.9	3766985.7	933.2	5	9.3	1.4

ORE6	Offroad Equipment	466297.9	3766985.7	937.7	5	9.3	1.4
ORE7	Offroad Equipment	466317.9	3766985.7	938.5	5	9.3	1.4
ORE8	Offroad Equipment	466257.9	3767005.7	935.2	5	9.3	1.4
ORE9	Offroad Equipment	466277.9	3767005.7	934.2	5	9.3	1.4
ORE10	Offroad Equipment	466297.9	3767005.7	936.4	5	9.3	1.4
ORE11	Offroad Equipment	466317.9	3767005.7	936.3	5	9.3	1.4
ORE12	Offroad Equipment	466337.9	3767005.7	935.2	5	9.3	1.4
ORE13	Offroad Equipment	466257.9	3767025.7	940.8	5	9.3	1.4
ORE14	Offroad Equipment	466277.9	3767025.7	940.0	5	9.3	1.4
ORE15	Offroad Equipment	466297.9	3767025.7	939.0	5	9.3	1.4
ORE16	Offroad Equipment	466317.9	3767025.7	936.6	5	9.3	1.4
ORE17	Offroad Equipment	466337.9	3767025.7	936.8	5	9.3	1.4
ORE18	Offroad Equipment	466417.9	3767025.7	936.6	5	9.3	1.4
ORE19	Offroad Equipment	466437.9	3767025.7	937.9	5	9.3	1.4
ORE20	Offroad Equipment	466257.9	3767045.7	950.2	5	9.3	1.4
ORE21	Offroad Equipment	466277.9	3767045.7	942.5	5	9.3	1.4
ORE22	Offroad Equipment	466297.9	3767045.7	937.9	5	9.3	1.4
ORE23	Offroad Equipment	466317.9	3767045.7	938.2	5	9.3	1.4
ORE24	Offroad Equipment	466337.9	3767045.7	938.2	5	9.3	1.4
ORE25	Offroad Equipment	466357.9	3767045.7	938.3	5	9.3	1.4
ORE26	Offroad Equipment	466377.9	3767045.7	939.6	5	9.3	1.4
ORE27	Offroad Equipment	466397.9	3767045.7	936.9	5	9.3	1.4
ORE28	Offroad Equipment	466417.9	3767045.7	936.8	5	9.3	1.4
ORE29	Offroad Equipment	466437.9	3767045.7	937.1	5	9.3	1.4
ORE30	Offroad Equipment	466257.9	3767065.7	944.7	5	9.3	1.4
ORE31	Offroad Equipment	466277.9	3767065.7	938.9	5	9.3	1.4
ORE32	Offroad Equipment	466297.9	3767065.7	938.3	5	9.3	1.4
ORE33	Offroad Equipment	466317.9	3767065.7	938.2	5	9.3	1.4
ORE34	Offroad Equipment	466337.9	3767065.7	938.0	5	9.3	1.4
ORE35	Offroad Equipment	466357.9	3767065.7	938.7	5	9.3	1.4
ORE36	Offroad Equipment	466377.9	3767065.7	940.0	5	9.3	1.4
ORE37	Offroad Equipment	466397.9	3767065.7	937.9	5	9.3	1.4
ORE38	Offroad Equipment	466417.9	3767065.7	936.8	5	9.3	1.4
ORE39	Offroad Equipment	466437.9	3767065.7	937.3	5	9.3	1.4
ORE40	Offroad Equipment	466457.9	3767065.7	938.3	5	9.3	1.4

ORE41	Offroad Equipment	466277.9	3767085.7	938.6	5	9.3	1.4
ORE42	Offroad Equipment	466297.9	3767085.7	938.1	5	9.3	1.4
ORE43	Offroad Equipment	466317.9	3767085.7	938.7	5	9.3	1.4
ORE44	Offroad Equipment	466337.9	3767085.7	938.5	5	9.3	1.4
ORE45	Offroad Equipment	466357.9	3767085.7	937.3	5	9.3	1.4
ORE46	Offroad Equipment	466377.9	3767085.7	937.8	5	9.3	1.4
ORE47	Offroad Equipment	466397.9	3767085.7	937.0	5	9.3	1.4
ORE48	Offroad Equipment	466417.9	3767085.7	936.9	5	9.3	1.4
ORE49	Offroad Equipment	466437.9	3767085.7	937.4	5	9.3	1.4
ORE50	Offroad Equipment	466457.9	3767085.7	938.0	5	9.3	1.4
ORE51	Offroad Equipment	466277.9	3767105.7	938.2	5	9.3	1.4
ORE52	Offroad Equipment	466297.9	3767105.7	937.9	5	9.3	1.4
ORE53	Offroad Equipment	466317.9	3767105.7	938.6	5	9.3	1.4
ORE54	Offroad Equipment	466337.9	3767105.7	939.5	5	9.3	1.4
ORE55	Offroad Equipment	466357.9	3767105.7	937.8	5	9.3	1.4
ORE56	Offroad Equipment	466377.9	3767105.7	938.2	5	9.3	1.4
ORE57	Offroad Equipment	466397.9	3767105.7	937.3	5	9.3	1.4
ORE58	Offroad Equipment	466417.9	3767105.7	937.5	5	9.3	1.4
ORE59	Offroad Equipment	466437.9	3767105.7	937.7	5	9.3	1.4
ORE60	Offroad Equipment	466457.9	3767105.7	938.4	5	9.3	1.4
ORE61	Offroad Equipment	466477.9	3767105.7	938.7	5	9.3	1.4
ORE62	Offroad Equipment	466277.9	3767125.7	938.3	5	9.3	1.4
ORE63	Offroad Equipment	466297.9	3767125.7	938.0	5	9.3	1.4
ORE64	Offroad Equipment	466317.9	3767125.7	937.7	5	9.3	1.4
ORE65	Offroad Equipment	466337.9	3767125.7	938.1	5	9.3	1.4
ORE66	Offroad Equipment	466357.9	3767125.7	938.5	5	9.3	1.4
ORE67	Offroad Equipment	466377.9	3767125.7	942.2	5	9.3	1.4
ORE68	Offroad Equipment	466397.9	3767125.7	937.8	5	9.3	1.4
ORE69	Offroad Equipment	466417.9	3767125.7	938.2	5	9.3	1.4
ORE70	Offroad Equipment	466437.9	3767125.7	938.5	5	9.3	1.4
ORE71	Offroad Equipment	466457.9	3767125.7	938.7	5	9.3	1.4
ORE72	Offroad Equipment	466477.9	3767125.7	939.0	5	9.3	1.4
ORE73	Offroad Equipment	466297.9	3767145.7	938.1	5	9.3	1.4
ORE74	Offroad Equipment	466317.9	3767145.7	938.6	5	9.3	1.4
ORE75	Offroad Equipment	466337.9	3767145.7	938.6	5	9.3	1.4

ORE76	Offroad Equipment	466357.9	3767145.7	939.3	5	9.3	1.4
ORE77	Offroad Equipment	466377.9	3767145.7	943.4	5	9.3	1.4
ORE78	Offroad Equipment	466397.9	3767145.7	937.7	5	9.3	1.4
ORE79	Offroad Equipment	466417.9	3767145.7	938.4	5	9.3	1.4
ORE80	Offroad Equipment	466437.9	3767145.7	939.2	5	9.3	1.4
ORE81	Offroad Equipment	466457.9	3767145.7	939.2	5	9.3	1.4
ORE82	Offroad Equipment	466477.9	3767145.7	939.4	5	9.3	1.4
ORE83	Offroad Equipment	466497.9	3767145.7	939.7	5	9.3	1.4
ORE84	Offroad Equipment	466317.9	3767165.7	938.8	5	9.3	1.4
ORE85	Offroad Equipment	466337.9	3767165.7	939.4	5	9.3	1.4
ORE86	Offroad Equipment	466357.9	3767165.7	940.5	5	9.3	1.4
ORE87	Offroad Equipment	466377.9	3767165.7	939.7	5	9.3	1.4
ORE88	Offroad Equipment	466397.9	3767165.7	938.0	5	9.3	1.4
ORE89	Offroad Equipment	466417.9	3767165.7	938.1	5	9.3	1.4
ORE90	Offroad Equipment	466437.9	3767165.7	939.8	5	9.3	1.4
ORE91	Offroad Equipment	466457.9	3767165.7	939.9	5	9.3	1.4
ORE92	Offroad Equipment	466477.9	3767165.7	940.0	5	9.3	1.4
ORE93	Offroad Equipment	466497.9	3767165.7	940.4	5	9.3	1.4
ORE94	Offroad Equipment	466317.9	3767185.7	938.7	5	9.3	1.4
ORE95	Offroad Equipment	466337.9	3767185.7	939.5	5	9.3	1.4
ORE96	Offroad Equipment	466357.9	3767185.7	940.4	5	9.3	1.4
ORE97	Offroad Equipment	466377.9	3767185.7	939.2	5	9.3	1.4
ORE98	Offroad Equipment	466397.9	3767185.7	938.4	5	9.3	1.4
ORE99	Offroad Equipment	466417.9	3767185.7	938.2	5	9.3	1.4
ORE100	Offroad Equipment	466437.9	3767185.7	940.2	5	9.3	1.4
ORE101	Offroad Equipment	466457.9	3767185.7	940.5	5	9.3	1.4
ORE102	Offroad Equipment	466477.9	3767185.7	940.6	5	9.3	1.4
ORE103	Offroad Equipment	466497.9	3767185.7	940.7	5	9.3	1.4
ORE104	Offroad Equipment	466517.9	3767185.7	939.8	5	9.3	1.4
ORE105	Offroad Equipment	466337.9	3767205.7	939.6	5	9.3	1.4
ORE106	Offroad Equipment	466357.9	3767205.7	939.8	5	9.3	1.4
ORE107	Offroad Equipment	466377.9	3767205.7	939.9	5	9.3	1.4
ORE108	Offroad Equipment	466397.9	3767205.7	938.9	5	9.3	1.4
ORE109	Offroad Equipment	466417.9	3767205.7	938.6	5	9.3	1.4
ORE110	Offroad Equipment	466437.9	3767205.7	939.7	5	9.3	1.4

ORE111	Offroad Equipment	466457.9	3767205.7	941.1	5	9.3	1.4
ORE112	Offroad Equipment	466477.9	3767205.7	941.1	5	9.3	1.4
ORE113	Offroad Equipment	466497.9	3767205.7	940.5	5	9.3	1.4
ORE114	Offroad Equipment	466517.9	3767205.7	939.7	5	9.3	1.4
ORE115	Offroad Equipment	466337.9	3767225.7	939.6	5	9.3	1.4
ORE116	Offroad Equipment	466357.9	3767225.7	939.9	5	9.3	1.4
ORE117	Offroad Equipment	466377.9	3767225.7	939.9	5	9.3	1.4
ORE118	Offroad Equipment	466397.9	3767225.7	939.7	5	9.3	1.4
ORE119	Offroad Equipment	466417.9	3767225.7	939.3	5	9.3	1.4
ORE120	Offroad Equipment	466437.9	3767225.7	939.6	5	9.3	1.4
ORE121	Offroad Equipment	466457.9	3767225.7	941.8	5	9.3	1.4
ORE122	Offroad Equipment	466477.9	3767225.7	941.3	5	9.3	1.4
ORE123	Offroad Equipment	466497.9	3767225.7	940.4	5	9.3	1.4
ORE124	Offroad Equipment	466517.9	3767225.7	939.9	5	9.3	1.4
ORE125	Offroad Equipment	466537.9	3767225.7	939.2	5	9.3	1.4
ORE126	Offroad Equipment	466357.9	3767245.7	940.2	5	9.3	1.4
ORE127	Offroad Equipment	466377.9	3767245.7	939.9	5	9.3	1.4
ORE128	Offroad Equipment	466397.9	3767245.7	940.0	5	9.3	1.4
ORE129	Offroad Equipment	466417.9	3767245.7	939.9	5	9.3	1.4
ORE130	Offroad Equipment	466437.9	3767245.7	940.3	5	9.3	1.4
ORE131	Offroad Equipment	466457.9	3767245.7	941.8	5	9.3	1.4
ORE132	Offroad Equipment	466477.9	3767245.7	941.3	5	9.3	1.4
ORE133	Offroad Equipment	466497.9	3767245.7	940.2	5	9.3	1.4
ORE134	Offroad Equipment	466517.9	3767245.7	939.6	5	9.3	1.4
ORE135	Offroad Equipment	466357.9	3767265.7	940.1	5	9.3	1.4
ORE136	Offroad Equipment	466377.9	3767265.7	940.2	5	9.3	1.4
ORE137	Offroad Equipment	466397.9	3767265.7	940.0	5	9.3	1.4
ORE138	Offroad Equipment	466417.9	3767265.7	940.8	5	9.3	1.4
ORE139	Offroad Equipment	466437.9	3767265.7	941.5	5	9.3	1.4
ORE140	Offroad Equipment	466457.9	3767265.7	941.8	5	9.3	1.4
ORE141	Offroad Equipment	466477.9	3767265.7	941.1	5	9.3	1.4
ORE142	Offroad Equipment	466497.9	3767265.7	940.0	5	9.3	1.4
ORE143	Offroad Equipment	466377.9	3767285.7	940.9	5	9.3	1.4
ORE144	Offroad Equipment	466397.9	3767285.7	940.9	5	9.3	1.4
ORE145	Offroad Equipment	466417.9	3767285.7	941.5	5	9.3	1.4

ORE146	Offroad Equipment	466437.9	3767285.7	941.9	5	9.3	1.4
ORE147	Offroad Equipment	466457.9	3767285.7	942.1	5	9.3	1.4
ORE148	Offroad Equipment	466477.9	3767285.7	941.3	5	9.3	1.4
ORE149	Offroad Equipment	466377.9	3767305.7	941.3	5	9.3	1.4
ORE150	Offroad Equipment	466397.9	3767305.7	941.6	5	9.3	1.4
ORE151	Offroad Equipment	466417.9	3767305.7	942.0	5	9.3	1.4
ORE152	Offroad Equipment	466437.9	3767305.7	942.4	5	9.3	1.4
ORE153	Offroad Equipment	466457.9	3767305.7	942.7	5	9.3	1.4
ORE154	Offroad Equipment	466397.9	3767325.7	941.6	5	9.3	1.4
ORE155	Offroad Equipment	466417.9	3767325.7	942.7	5	9.3	1.4
ORE156	Offroad Equipment	466437.9	3767325.7	943.0	5	9.3	1.4

Table 5A
Unmitigated Construction Emissions by Source and Substance (lb/yr)

Substance Name	CAS	Offsite Truck	Offroad Equipment	Total
Diesel Exhaust PM	9901	5.44	454.66	**460.10**

Table 5B
Mitigated Construction Emissions by Source and Substance (lb/yr)

Substance Name	CAS	Offsite Truck	Offroad Equipment	Total
Diesel Exhaust PM	9901	5.44	18.42	**23.86**

Table 6
Operations Source Modeling Parameters

Point Sources

Release ID	Release Description	UTM X (m)	UTM Y (m)	Elevation (ft)	Stack Height (m)	Stack Temp (C)	Stack Velocity (m/s)	Stack Diameter (m)
SILO1	Silo 1	466393	3767210	939.4	18	20	2.59	0.1524
SILO2	Silo 2	466396	3767215	939.4	18	20	2.59	0.1524
SILO3	Silo 3	466461	3767174	940.2	18	20	2.59	0.1524
SILO4	Silo 4	466458	3767169	940.0	18	20	2.59	0.1524
SILO5	Silo 5	466419	3767107	937.6	18	20	2.59	0.1524
SILO6	Silo 6	466416	3767102	937.3	18	20	2.59	0.1524
SILO7	Silo 7	466350	3767142.5	938.6	18	20	2.59	0.1524
SILO8	Silo 8	466353	3767147	939.0	18	20	2.59	0.1524
NGBRNR	Natural Gas Burner	466410	3767165	937.9	18	54.44	10.16	0.3048

Polygon Area Sources

Release ID	Release Description	UTM X (m)	UTM Y (m)	Elevation	Release Height (m)	Initial Vertical Dimension (m)
OFFRD	Offroad Equipment	466237	3766989.3	931.7	3.7	1.72

Volume Sources

Release ID	Release Description	UTM X (m)	UTM Y (m)	Elevation	Release Height (m)	Initial Lateral Dimension (m)	Initial Vertical Dimension (m)
RCYCL	Recycle Plant	466563	3767242	938.2	12	14	5.6
ONTRK1	On Site Trucks	466255.1	3767103.7	938.3	3.3	3.12	0.77
ONTRK2	On Site Trucks	466276.3	3767113.4	938.1	3.3	3.12	0.77
ONTRK3	On Site Trucks	466289.2	3767134.8	938.3	3.3	3.12	0.77
ONTRK4	On Site Trucks	466302.1	3767156.2	938.3	3.3	3.12	0.77
ONTRK5	On Site Trucks	466315	3767177.6	938.7	3.3	3.12	0.77
ONTRK6	On Site Trucks	466327.9	3767199	939.0	3.3	3.12	0.77
ONTRK7	On Site Trucks	466340.8	3767220.4	939.9	3.3	3.12	0.77
ONTRK8	On Site Trucks	466353.7	3767241.9	940.1	3.3	3.12	0.77
ONTRK9	On Site Trucks	466366.6	3767263.3	940.3	3.3	3.12	0.77
ONTRK10	On Site Trucks	466379.5	3767284.7	940.9	3.3	3.12	0.77
ONTRK11	On Site Trucks	466391.3	3767304.2	941.6	3.3	3.12	0.77
ONTRK12	On Site Trucks	466414	3767289.2	941.5	3.3	3.12	0.77
ONTRK13	On Site Trucks	466434.8	3767275.3	941.7	3.3	3.12	0.77
ONTRK14	On Site Trucks	466455.6	3767261.5	941.7	3.3	3.12	0.77
ONTRK15	On Site Trucks	466476.5	3767247.7	941.4	3.3	3.12	0.77
ONTRK16	On Site Trucks	466497.3	3767233.9	940.4	3.3	3.12	0.77
ONTRK17	On Site Trucks	466518.1	3767220.1	939.8	3.3	3.12	0.77
ONTRK18	On Site Trucks	466539	3767206.2	939.0	3.3	3.12	0.77
ONTRK19	On Site Trucks	466535	3767187	938.7	3.3	3.12	0.77
ONTRK20	On Site Trucks	466521.8	3767165.8	939.5	3.3	3.12	0.77
ONTRK21	On Site Trucks	466508.6	3767144.5	939.2	3.3	3.12	0.77
ONTRK22	On Site Trucks	466495.4	3767123.3	939.1	3.3	3.12	0.77
ONTRK23	On Site Trucks	466482.2	3767102	938.7	3.3	3.12	0.77
ONTRK24	On Site Trucks	466469	3767080.8	938.4	3.3	3.12	0.77
ONTRK25	On Site Trucks	466455.8	3767059.6	938.5	3.3	3.12	0.77
ONTRK26	On Site Trucks	466442.7	3767038.3	937.6	3.3	3.12	0.77
ONTRK27	On Site Trucks	466429.5	3767017.1	937.5	3.3	3.12	0.77
ONTRK28	On Site Trucks	466339.4	3767006.3	935.2	3.3	3.12	0.77
ONTRK29	On Site Trucks	466317.7	3767018.7	936.5	3.3	3.12	0.77
ONTRK30	On Site Trucks	466296	3767031.1	939.1	3.3	3.12	0.77
ONTRK31	On Site Trucks	466274.3	3767043.5	943.2	3.3	3.12	0.77
ONTRK32	On Site Trucks	466252.6	3767055.9	948.5	3.3	3.12	0.77
ONTRK33	On Site Trucks	466230.9	3767068.3	938.3	3.3	3.12	0.77
ONTRK34	On Site Trucks	466418.8	3767055.5	936.9	3.3	3.12	0.77
ONTRK35	On Site Trucks	466396.8	3767068	938.2	3.3	3.12	0.77

ONTRK36	On Site Trucks	466375.4	3767080.9	939.0	3.3	3.12	0.77
ONTRK37	On Site Trucks	466354.2	3767094.6	937.5	3.3	3.12	0.77
ONTRK38	On Site Trucks	466332.4	3767108	940.2	3.3	3.12	0.77
ONTRK39	On Site Trucks	466310	3767121.6	937.5	3.3	3.12	0.77
ONTRK40	On Site Trucks	466399	3767269.2	940.1	3.3	3.12	0.77
ONTRK41	On Site Trucks	466421.2	3767254.4	940.2	3.3	3.12	0.77
ONTRK42	On Site Trucks	466442	3767241	940.4	3.3	3.12	0.77
ONTRK43	On Site Trucks	466463	3767228	941.8	3.3	3.12	0.77
ONTRK44	On Site Trucks	466485	3767214	940.9	3.3	3.12	0.77
ONTRK45	On Site Trucks	466506	3767201	940.3	3.3	3.12	0.77
OFTRK1	Offsite Trucks	466196	3767091.7	939.0	3.3	3.12	0.77
OFTRK2	Offsite Trucks	466127.4	3767093.4	941.7	3.3	3.12	0.77
OFTRK3	Offsite Trucks	466044.3	3767112	940.3	3.3	3.12	0.77
OFTRK4	Offsite Trucks	466046.2	3767212	943.8	3.3	3.12	0.77
OFTRK5	Offsite Trucks	466048	3767312	950.1	3.3	3.12	0.77
OFTRK6	Offsite Trucks	466049.9	3767412	954.7	3.3	3.12	0.77
OFTRK7	Offsite Trucks	466051.7	3767512	957.1	3.3	3.12	0.77
OFTRK8	Offsite Trucks	466053.6	3767612	961.0	3.3	3.12	0.77
OFTRK9	Offsite Trucks	466045.3	3767709.9	974.0	3.3	3.12	0.77
OFTRK10	Offsite Trucks	465996.8	3767796.6	978.3	3.3	3.12	0.77
OFTRK11	Offsite Trucks	465935.7	3767875.7	982.1	3.3	3.12	0.77
OFTRK12	Offsite Trucks	465863.3	3767944.6	983.1	3.3	3.12	0.77
OFTRK13	Offsite Trucks	465826.3	3767979.8	984.6	3.3	3.12	0.77
OFTRK14	Offsite Trucks	465826.1	3768028.8	986.8	3.3	3.12	0.77
OFTRK15	Offsite Trucks	465825.8	3768128.8	993.9	3.3	3.12	0.77
OFTRK16	Offsite Trucks	465825.5	3768228.8	1002.4	3.3	3.12	0.77
OFTRK17	Offsite Trucks	465825.2	3768328.8	1005.2	3.3	3.12	0.77
OFTRK18	Offsite Trucks	465824.8	3768428.8	1001.9	3.3	3.12	0.77
OFTRK19	Offsite Trucks	465824.5	3768528.8	994.1	3.3	3.12	0.77
OFTRK20	Offsite Trucks	465824.2	3768628.8	990.6	3.3	3.12	0.77
OFTRK21	Offsite Trucks	465823.9	3768728.8	994.0	3.3	3.12	0.77
OFTRK22	Offsite Trucks	465823.5	3768828.8	998.9	3.3	3.12	0.77
OFTRK23	Offsite Trucks	465823.2	3768928.8	1004.0	3.3	3.12	0.77
OFTRK24	Offsite Trucks	465822.9	3769028.8	1008.8	3.3	3.12	0.77
OFTRK25	Offsite Trucks	465822.5	3769128.8	1013.3	3.3	3.12	0.77
OFTRK26	Offsite Trucks	465822.2	3769228.8	1017.3	3.3	3.12	0.77
OFTRK27	Offsite Trucks	465821.9	3769328.8	1022.0	3.3	3.12	0.77
OFTRK28	Offsite Trucks	465821.6	3769428.8	1031.3	3.3	3.12	0.77
OFTRK29	Offsite Trucks	465821.2	3769528.8	1053.1	3.3	3.12	0.77

OFTRK30	Offsite Trucks	465820.9	3769628.8	1068.3	3.3	3.12	0.77
OFTRK31	Offsite Trucks	465820.6	3769728.8	1052.4	3.3	3.12	0.77
OFTRK32	Offsite Trucks	465820.3	3769828.8	1064.7	3.3	3.12	0.77
OFTRK33	Offsite Trucks	465820	3769928.8	1073.0	3.3	3.12	0.77
OFTRK34	Offsite Trucks	465746.6	3769931.7	1057.6	3.3	3.12	0.77
OFTRK35	Offsite Trucks	465650.4	3769904.4	1052.2	3.3	3.12	0.77
OFTRK36	Offsite Trucks	465554.2	3769877.1	1052.3	3.3	3.12	0.77
OFTRK37	Offsite Trucks	466044	3767067.4	939.1	3.3	3.12	0.77
OFTRK38	Offsite Trucks	466040.4	3766995.6	937.0	3.3	3.12	0.77
OFTRK39	Offsite Trucks	466037.9	3766924.3	930.3	3.3	3.12	0.77
OFTRK40	Offsite Trucks	466001.2	3766904.4	927.2	3.3	3.12	0.77
OFTRK41	Offsite Trucks	466021.3	3766819.8	915.7	3.3	3.12	0.77
OFTRK42	Offsite Trucks	466044.5	3766722.5	906.6	3.3	3.12	0.77
OFTRK43	Offsite Trucks	466067.7	3766625.3	901.5	3.3	3.12	0.77
OFTRK44	Offsite Trucks	466090.8	3766528	896.9	3.3	3.12	0.77
OFTRK45	Offsite Trucks	466114	3766430.7	892.0	3.3	3.12	0.77
OFTRK46	Offsite Trucks	466137.2	3766333.4	886.6	3.3	3.12	0.77
OFTRK47	Offsite Trucks	466160.3	3766236.1	879.5	3.3	3.12	0.77
OFTRK48	Offsite Trucks	466183.5	3766138.9	869.5	3.3	3.12	0.77
OFTRK49	Offsite Trucks	466206.6	3766041.6	859.2	3.3	3.12	0.77
OFTRK50	Offsite Trucks	466229.8	3765944.3	855.5	3.3	3.12	0.77
OFTRK51	Offsite Trucks	466253	3765847	853.9	3.3	3.12	0.77
OFTRK52	Offsite Trucks	466276.1	3765749.7	852.9	3.3	3.12	0.77
OFTRK53	Offsite Trucks	466299.3	3765652.5	850.7	3.3	3.12	0.77
OFTRK54	Offsite Trucks	466322.5	3765555.2	849.7	3.3	3.12	0.77
OFTRK55	Offsite Trucks	466345.6	3765457.9	855.2	3.3	3.12	0.77
OFTRK56	Offsite Trucks	466368.8	3765360.6	863.4	3.3	3.12	0.77
OFTRK57	Offsite Trucks	466392.1	3765263.4	866.8	3.3	3.12	0.77
OFTRK58	Offsite Trucks	466415.4	3765166.1	835.7	3.3	3.12	0.77
OFTRK59	Offsite Trucks	466438.7	3765068.9	832.0	3.3	3.12	0.77
OFTRK60	Offsite Trucks	466461.9	3764971.6	829.6	3.3	3.12	0.77
OFTRK61	Offsite Trucks	466485.2	3764874.4	856.0	3.3	3.12	0.77
OFTRK62	Offsite Trucks	466508.5	3764777.1	858.5	3.3	3.12	0.77
OFTRK63	Offsite Trucks	466531.7	3764679.8	847.6	3.3	3.12	0.77
OFTRK64	Offsite Trucks	466529.8	3764580.4	841.3	3.3	3.12	0.77
OFTRK65	Offsite Trucks	466523.9	3764480.5	836.9	3.3	3.12	0.77
OFTRK66	Offsite Trucks	466518.1	3764380.7	837.2	3.3	3.12	0.77
OFTRK67	Offsite Trucks	466512.3	3764280.9	835.7	3.3	3.12	0.77
OFTRK68	Offsite Trucks	466506.5	3764181	834.2	3.3	3.12	0.77

OFTRK69	Offsite Trucks	466500.7	3764081.2	833.0	3.3	3.12	0.77
OFTRK70	Offsite Trucks	466494.9	3763981.4	831.6	3.3	3.12	0.77
OFTRK71	Offsite Trucks	466489.1	3763881.5	830.3	3.3	3.12	0.77
OFTRK72	Offsite Trucks	466483.2	3763781.7	828.3	3.3	3.12	0.77
OFTRK73	Offsite Trucks	466477.4	3763681.9	826.6	3.3	3.12	0.77
OFTRK74	Offsite Trucks	466471.6	3763582	825.5	3.3	3.12	0.77
OFTRK75	Offsite Trucks	466465.8	3763482.2	824.4	3.3	3.12	0.77
OFTRK76	Offsite Trucks	466460	3763382.4	822.4	3.3	3.12	0.77
OFTRK77	Offsite Trucks	466454.2	3763282.6	820.3	3.3	3.12	0.77
OFTRK78	Offsite Trucks	466448.3	3763182.7	818.7	3.3	3.12	0.77
OFTRK79	Offsite Trucks	466442.5	3763082.9	817.4	3.3	3.12	0.77
OFTRK80	Offsite Trucks	466436.7	3762983.1	818.5	3.3	3.12	0.77
OFTRK81	Offsite Trucks	466430.9	3762883.2	816.2	3.3	3.12	0.77
OFTRK82	Offsite Trucks	466422.9	3762783.6	814.6	3.3	3.12	0.77
OFTRK83	Offsite Trucks	466412.1	3762684.2	813.3	3.3	3.12	0.77
OFTRK84	Offsite Trucks	466401.3	3762584.8	812.1	3.3	3.12	0.77
OFTRK85	Offsite Trucks	466390.5	3762485.3	811.3	3.3	3.12	0.77
OFTRK86	Offsite Trucks	466379.6	3762385.9	810.1	3.3	3.12	0.77
OFTRK87	Offsite Trucks	466368.8	3762286.5	809.6	3.3	3.12	0.77
OFTRK88	Offsite Trucks	466358	3762187.1	810.8	3.3	3.12	0.77
OFTRK89	Offsite Trucks	466347.2	3762087.7	813.1	3.3	3.12	0.77
OFTRK90	Offsite Trucks	466336.3	3761988.3	817.4	3.3	3.12	0.77
OFTRK91	Offsite Trucks	466325.5	3761888.9	827.1	3.3	3.12	0.77
OFTRK92	Offsite Trucks	466314.7	3761789.5	829.3	3.3	3.12	0.77
MAIN	Main Plant	466410	3767165	937.9	17	37	8

Table 7
Mitigated Operations Emissions by Source and Substance (lb/yr)

Substance Name	CAS	Block Manufacturing	Cement Silo Loading	Fly Ash Silo Loading	Onsite Trucks	Offsite Trucks	Offroad Equipment	Total
Diesel Exhaust PM	9901	--	--	--	5.32	113.59	52.63	**171.54**
Acetaldehyde	75070	0.11	--	--	--	--	--	**0.11**
Acrolein	107028	0.07	--	--	--	--	--	**0.07**
Ammonia	7664417	81.81	--	--	--	--	--	**81.81**
Arsenic	7440382	--	< 0.01	0.02	--	--	--	**0.02**
Benzene	71432	0.20	--	--	--	--	--	**0.20**
Beryllium	7440417	--	< 0.01	< 0.01	--	--	--	**< 0.01**
Cadmium	7440439	--	< 0.01	< 0.01	--	--	--	**< 0.01**
Ethyl Benzene	100414	0.24	--	--	--	--	--	**0.24**
Formaldehyde	50000	0.43	--	--	--	--	--	**0.43**
Hexane	110543	0.16	--	--	--	--	--	**0.16**
Lead	7439921	--	< 0.01	0.01	--	--	--	**0.01**
Manganese	7439965	--	0.01	0.01	--	--	--	**0.01**
Naphthalene	91203	0.01			--	--	--	**0.01**
Nickel	7440020	--	< 0.01	0.04	--	--	--	**0.05**
PAHs (except Naphthalene)	1151	< 0.01	--	--	--	--	--	**< 0.01**
Selenium	7782492	--	--	< 0.01	--	--		**< 0.01**
Toluene	108883	0.94	--	--	--	--	--	**0.94**
Total Chromium	7440473	--	< 0.01	0.02	--	--	--	**0.03**
Total Phosphorus	7723140	--	0.02	0.07	--	--	--	**0.09**
Xyelene	1330207	0.70	--	--	--	--	--	**0.70**

Figures

HRA FIGURE 1. MEIR and MEIW

Legend

Site Boundary
MEIR
MEIW

N

Prepared For:

CEQA Initial Study
Angelus Block Co Inc. - Rialto Block Plant
3435 S Riverside Avenue
Rialto, CA 91316
AGLS-20-9598

NV5 ALTA ENVIRONMENTAL

NV5
3777 Long Beach Blvd, Annex Bldg
Long Beach, CA 90807
562.495.5777

Delivering Solutions
Improving Lives

Appendix D

Biological Resources Study

FINAL
ANGELUS BLOCK BIOLOGICAL RESOURCES STUDY

August 6, 2020

Prepared For:

Mr. John Quigley
Angelus Block Co., Inc.
3435 South Riverside Avenue
Rialto, CA 91316

N|V|5

Angelus Block Co, Inc.
Riverside County, California

PROJECT NUMBER 227520-0000772.00

August 6, 2020

Mr. John Quigley
Angelus Block Co., Inc.
3435 S. Riverside Avenue
Rialto, CA 91316

SUBJECT: FINAL DRAFT ANGELUS BLOCK BIOLOGICAL RESOURCES STUDY

Dear Mr. Quigley,

NV5 is pleased to provide the attached Biological Resources Study (Report) which documents biological resources on or adjacent to the proposed Angelus Block Project Site in Riverside County, CA and provides recommendations for rare plant surveys and specific species protocol surveys during the appropriate survey season in 2020/21.

This Report includes a description of methodologies, a summary of the preliminary literature review, survey findings and conclusions/recommendations. Information on vegetation, wildlife, listed species and potential jurisdictional features is provided. It is important to note that the primary intentions of this effort are to identify potential issues with listed species and identify potential 2020 survey needs. This Report also includes information that may be incorporated into a California Environmental Quality Act (CEQA) Initial Study Determination, but additional biological information may be required should the project move forward into subsequent phases (as identified in the Executive Summary).

NV5 appreciates the opportunity to provide services for this important project. Please contact the undersigned below at 858-385-0500, 15092 Avenue of Science, Suite 200, San Diego, California, 92128 if you have any questions or need additional information.

Sincerely,

NV5

Thomas Acuña	Robin Kinmont	Jeremiah George
Environmental Manager	Senior Biologist	Senior Biologist

PROJECT NUMBER 227520-0000772.00

EXECUTIVE SUMMARY

This Biological Resources Study (Report) summarizes information gathered from a review of desktop resources (existing information) and a general biological survey conducted over approximately 102.6 acres in the community of Rialto in San Bernardino County, California where Angelus Block proposes to construct a concrete plant (Facility).

The purpose for performing the general biological survey was to identify potential biological resource constraints prior to development of the Facility, and utilize the findings to provide recommendations for additional biological resources survey efforts to be conducted in the future. The biological survey was conducted in June 2020 to document existing conditions and map biological resources present within the proposed Project Site and the associated 500-ft Buffer area (collectively, the 102.6-acre Survey Area). During the survey, NV5 biologists' mapped vegetation communities, mapped and/or recorded plant and animal observations, documented bird nests, evaluated the potential for the presence of special-status plant and animal species and their habitats, and documented any sensitive plant communities. An evaluation of potentially jurisdictional aquatic features that occur within the Survey Area was also conducted to determine if a jurisdictional delineation would be recommended in the future. This included the potential presence of jurisdictional waters of the United States and State of California, including wetlands and waterways.

During the survey, three bird nests were observed within Southern California Edison lattice towers. One was an active red-tailed hawk (*Buteo jamaicensis*) nest and the other two were inactive corvid (common raven [*Corvus corax*] or American crow [*Corvus brachyrhynchos*]) nests, also located on lattice towers. Approximately 29.5 acres of Delhi Sands flower-loving fly (DSFLF, *Rhaphiomidas terminatus abdominalis*) potential habitat occurs within the Survey Area. Since DSFLF are known to occur within the area, the potential habitat on-site is assumed to be occupied. No DSFLF protocol-level surveys were conducted.

Recommendations

Assuming all requirements of the Angelus Block Incidental Take Permit (ITP) and associated implementation agreement, including the amendment to the implementation agreement, have been met, no DSFLF surveys are recommended at this time.

However, consultation with state and County wildlife agencies is recommended to determine if further assessment is appropriate, due to identification of appropriate habitat for the Los Angeles Pocket Mouse (*Perognathus longimembris brevinasus*), and that the San Bernardino County Burrowing Owl (*Athene cunicularia*) Survey area overlay includes this area of the County. No special-status plant or wildlife species were detected during the general biological assessment of the site.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

APPENDICES

1.0 INTRODUCTION

This Report documents the findings of a general biological survey conducted by NV5, Inc. (NV5) on land near the community of Rialto, Riverside County, California (Project Site). The purpose of this Report is to document the existing conditions within the proposed Project Site, which includes mapping vegetation communities, documenting plant and animal species and habitat observations, evaluating the potential for special-status biological resources to occur, and determining if protocol-level surveys are recommended.

The Project Site is approximately 29.5-acres. The Project Site was buffered by 500 feet (ft) for the general biological survey. Collectively, the Survey Area is composed of the Project Site and the associated 500-ft Buffer and is approximately 102.6 acres.

1.1 PROJECT LOCATION

The proposed Project Site is located between Agua Mansa Road and South Riverside Avenue in Rialto, California. Rialto is an incorporated community within San Bernardino County. The Project Site is specifically located to the southwest of Angles Block Co. and an existing Southern California Edison (SCE) 220kV transmission line and 0.5 mile west of the Santa Ana River (Figures 1 and 2, Appendix A). Parcels and landownership within and adjacent to the Survey Area are shown on Figure 3 (Appendix A).

1.2 PROJECT SETTING

The Project Site is located at the terminus of Fortuna Way approximately 700 feet east of South Riverside Avenue. The Project Site consists of Assessor's Parcel Numbers (APNs) 0260-061-41 and 0260-061-67 and is located within the Heavy Industrial (H-IND) zone of the Agua Mansa Industrial Corridor (City, 1986) and the General Industry (GI) zone of the 2010 City of Rialto General Plan (City, 2010). The Project Site is approximately 2 miles south of Interstate 10 ("I-10") and approximately 3.5 miles north, northwest of the junction of California State Routes 60 ("CA-60") and 91 ("CA-91"), and Interstate 215 ("I-215"), The Santa Ana River is located approximately two-thirds of a mile to the east southeast of the Project Site. The surrounding area consists of vacant land, industrial, commercial, warehouse, and mitigation lands.

The Agua Mansa Properties, Inc. Facility, an active construction debris landfill, is located directly north of the Project Site. The 30 acre Angelus Block Delhi Sands flower-loving fly (DSFLF) mitigation parcel habitat conservation area, owned by Rivers and Land Conservancy, lies to the west northwest of the Project Site (Figure 3, Appendix A). The E.Z. Mix and Angelus Paver Plant facilities are located to the southwest of the Project Site. The Agua Mansa Pioneer Cemetery is adjacent to the Project Site to the southeast. A West Valley Water District extraction well and supporting infrastructure are located in the southeast corner of the Facility. This facility is not part of the Angelus property. The West Riverside Canal, one residence, and Agua Mansa Road lie to the east of the Project Site. The Agua Mansa Power Plant and Colton/San Bernardino water treatment and infiltration facility are located on the east side of Agua Mansa Road.

The nearest residential community is located approximately two-thirds of a mile to the northwest of the Project Site. However, the nearest residence is located on Agua Mansa Road approximately 500 feet southeast of the Project Site. The nearest school, Crestmore Elementary at 18870 Jurupa Ave, Bloomington, CA, is located approximately 1.6 miles to the west of the Project Site. A Site Vicinity Map is provided as Figure 1, and the Project Site boundary and the associated 500-ft Buffer are shown on Figure 2.

1.3 EXISTING CONDITIONS

The Project Site has been owned and maintained by Angelus Block Co, Inc. since the late 1990's. Currently, the Project Site consists of an active Recycle Plant, paved product storage, unpaved product storage, and unused space. There is one entrance to the Project Site via one gate at the terminus of Fortuna Way. The unpaved storage areas are used for the storage of miscellaneous products, materials, and equipment from Angelus' various facilities in the area. The paved storage area is used to store finished paver products from the nearby Angelus Rialto Paver Plant located at 3435 South Riverside Avenue, Bloomington, CA 92316. This paved storage area can be accessed from the Project Site via a ramp at the south side of the Project Site.

The existing Recycle Plant accepts discarded product from Angelus' various products in the area. The material is stockpiled, wetted for dust control, loaded into a hopper using a front-end loader, and crushed. To provide dust control, a sprinkler system is used to wet the material prior to transfer into the hopper. The resulting material is conveyed and stockpiled and then transferred to the existing 3435 Riverside Avenue paver plant for reuse. The existing Recycle Plant operates under South Coast Air Quality Management District (SCAQMD) Permit to Operate (PTO) F92562, which limits operation of the Recycle Plant to a maximum of 65,500 tons of material per month.

The area to the northwest of the Project Site is the 30.5-acre DSFLF habitat conservation area. This "Conservation Area" was set aside in the 1999 Final Habitat Conservation Plan established for the development of the area that includes the Project Site (Michael Brandman Associates, 1999). In compliance with the Habitat Conservation Plan and the executed Implementation Agreement, the United States Fish and Wildlife Service (USFWS) authorized an Incidental Take Permit for the DSFLF on August 27, 1999 to Angelus Block Company, Inc., E-Z Mix, Inc., and the Edward Antonini Residuary Trust (Angelus Block et. al.). The Implementation Agreement and associated Federal Fish and Wildlife Permit are included in Appendix B.

1.4 PROJECT DESCRIPTION

The proposed Project involves the construction and operation of a new concrete block manufacturing Facility. In general, the concrete block manufacturing process includes raw material delivery and storage; material transfer and mixing; product forming, curing, and finishing; and product storage, onsite movement, packaging, and shipment to customers. Finished products include a wide variety of concrete masonry units (CMUs) that provide structural strength and aesthetic facades for buildings constructed throughout California.

1.4.1 Location and Site Layout

The proposed Project will occupy approximately 30 acres of land located at the terminus of Fortuna Way approximately 700 feet east of Riverside Avenue. A Site Vicinity Map is provided as Figure 1, and the Project Site boundary is shown in Figure 2 Project Location. Site plans are provided in Appendix C. Once operational, the Project Site will include the following structures:

Table 1. Proposed Structures

Structure	Stories	Max Height (ft)	Building Area (square feet)
Manufacturing Plant Building	1	57.0	135,581
Admin Building	2	38.0	10,018
Industrial Building / Mechanic Shop	1	29.5	6,080
Storage Warehouse Building	1	31.0	14,940
Metal Canopy Structure	1	29.5	21,534

In addition to the structures above, the Project Site will include one approximately 4,000-gallon diesel aboveground storage tank (AST) with one fuel dispenser. The entire Project Site will be paved with interlocking, pervious concrete pavers except for structure footprints. There will be two gates at the terminus of Fortuna Way: one one-way entrance gate and one one-way exit gate. The gates will be opened and locked manually.

1.5 PROJECT SETTING AND LAND USE

1.5.1 Current Use

Currently, the Project Site is fenced in on three sides with topographic features helping delineate the eastern border in lieu of fencing. The Project Site is currently mostly not in use. The gravel area was previously used for storing material. A small portion of the gravel area along the southeastern side of the fence is still being utilized for material storage. The Project Site has been mowed within the past 2-3 years for fire management purposes (per com Quigley 2020). Portions of the 500-ft Buffer to the northwest is currently owned by the Rivers and Land Conservancy and is set aside for conservation; Agua Mansa Properties, Inc. occurs to the north, and the County of San Bernardino to the east and south. MEA Manufacturing parcels also occur to the east and south of the Project Site (Figure 3, Appendix A).

1.5.2 Climate

The climate is wet, cool chilly winters with hot, dry summers. The Survey Area is subject to temperatures of 40 degrees in winter to >90 degrees in summer. Precipitation average is 16 inches of rain per year (WRCC 2020).

1.5.3 Elevation

The topography of the Survey Area is relatively flat and the elevation of the Survey Area is approximately 1,250 feet above sea level (asl).

1.5.4 Watershed and Drainages

Several freshwater ponds occur to the north outside of the Survey Area. The Santa Ana River occurs to the east outside of the Survey Area (U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory 2020). No rivers, streams, wetlands, culverts, bed/bank channels or swales are present within the Survey Area.

1.5.5 Soils

The Natural Resources Conservation Service (NRCS) Web Soil Survey delineates 4 soil units within the Survey Area (Figure 4, Appendix A). The following soils are found within the Project Site:

- Db: Delhi fine sand.
- HaC: Hanford coarse sandy loam, 2 to 9 percent slopes.
- ScC: San Emidgio fine sandy loam, 2 to 9 percent slopes.
- TvC: Tujunga gravelly loamy sand, 0 to 9 percent slopes.

Delhi soil series consists of sandy, somewhat excessively drained soils. Delhi soils series are wind deposited material weathered from granitic rock sources (Web Soil Survey, USDA 2020). Delhi soils are on floodplains, alluvial fans and terraces. Slopes are 0 to 15 percent. Principal native shrubs include California buckwheat (*Eriogonum fasciculatum*) and a few other shrub species, the understory varies from open sand with very little annual cover to extensive native and / or exotic annual grasses and forbs.

2.0 REGULATORY FRAMEWORK

Federal, state, and local agencies have established several regulations to protect and conserve natural resources. An overview of the agency regulations that may be applicable to the project are provided below. The final determination as to what types of permits are required will be made by the regulating agencies.

2.1 FEDERAL REGULATIONS

2.1.1 Federal Endangered Species Act

The federal Endangered Species Act (ESA) of 1973, as amended, provides for the listing of endangered and threatened species of plants and animals and the designation of critical habitat for these listed species. ESA regulates the "taking" of any endangered fish or wildlife species, per Section 9. As development is proposed, the responsible agency or individual landowner is required to consult with the USFWS to assess potential impacts on listed species (including plants) or the critical habitat of a listed species, pursuant to Sections 7 and 10 of the ESA. The USFWS is required to determine the extent a project would impact a particular species. If the USFWS determines that a project is likely to potentially impact a species, measures to avoid or reduce such impacts must be identified. Following consultation and the issuance of a Biological Opinion, the USFWS may issue an Incidental Take Statement which allows for the take of a species if it is incidental to another authorized activity and will not adversely affect the existence of the species. Section 7 of the ESA provides for permitting of projects requiring federal permits. Section 10 of the ESA provides for issuance of incidental take permits to non-federal parties in conjunction with the development of a habitat conservation plan (HCP).

2.1.2 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA; 16 U.S. Code [U.S.C.] 703 et seq.) is a federal statute that implements treaties with several countries on the conservation and protection of migratory birds. The number of bird species covered by the MBTA is extensive and is listed at 50 CFR 10.13. The USFWS enforces the MBTA and prohibits "by any means or in any manner, to pursue, hunt, take, capture, [or] kill" any migratory bird, or attempt such actions, except as permitted by regulation.

2.1.3 Rivers and Harbors Act of 1899

The Rivers and Harbors Act of 1899 prohibits the discharge of any material into navigable waters of the United States, or tributaries thereof, without a permit. The act also makes it a misdemeanor to excavate, fill, or alter the course, condition, or capacity of any port, harbor, or channel, or to dam navigable streams without a permit. Many activities originally covered by the Rivers and Harbors Act are now regulated under the Clean Water Act of 1972, discussed below. However, the 1899 Act retains relevance and created the structure under which the United States Army Corps of Engineers (Corps) oversees permitting under CWA Section 404. Clean Water Act Pursuant to Section 404 of the CWA, the Corps is authorized to regulate any activity that would result in the discharge of dredged or fill material into waters of the U.S., including wetlands and those waters listed in 33 CFR 328.3. The Corps, with oversight from the U.S. Environmental Protection Agency (EPA), has the principal authority to issue CWA Section 404 permits. A water quality certification or waiver pursuant to

Section 401 of the CWA is required for all Section 404 permitted actions. The Regional Water Quality Control Boards (RWQCBs), divisions of the State Water Resources Control Board, provide oversight of the 401-permit process in California. The RWQCBs are required to provide “certification that there is reasonable assurance that an activity that may result in the discharge to waters of the United States will not violate water quality standards.” Water Quality Certification must be based on the finding that a proposed discharge will comply with applicable water quality standards. The National Pollutant Discharge Elimination System (NPDES) permit program regulates discharge of pollutants into surface waters of the U.S. under Section 402 of the CWA. Under the permit program, a project causing substantial impacts on wetlands may require an Individual Permit whereas those projects only minimally affecting wetlands may meet the conditions of one of the existing Nationwide Permits.

2.2 STATE REGULATIONS

2.2.1 California Endangered Species Act

The California Endangered Species Act (CESA) of 1984, in combination with the California Native Plant Protection Act of 1977, regulates the listing and take of plant and animal species designated as endangered, threatened, or rare within the state. California also lists species of special concern based on limited distribution, declining populations, diminishing habitat, or unusual scientific, recreational, or educational value.

The CESA defines an endangered species as “a native species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant which is in serious danger of becoming extinct throughout all, or a significant portion, of its range due to one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, or disease.”

The CESA defines a threatened species as “a native species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant that, although not presently threatened with extinction, is likely to become an endangered species in the foreseeable future in the absence of the special protection and management efforts required by this chapter. Any animal determined by the commission as rare on or before January 1, 1985 is a threatened species.”

Candidate species are defined as “a native species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant that the commission has formally noticed as being under review by the department for addition to either the list of endangered species or the list of threatened species, or a species for which the commission has published a notice of proposed regulation to add the species to either list.” Candidate species may be afforded temporary protection as though they were already listed as threatened or endangered at the discretion of the California Fish and Game Commission (CFGC).

Article 3, Sections 2080 through 2085 of the CESA address the taking of threatened, endangered, or candidate species by stating “no person shall import into this state, export out of this state, or take, possess, purchase, or sell within this state, any species, or any part or product thereof, that the commission determines to be an endangered species or a threatened species, or attempt any of those acts, except as otherwise provided.” Under the CESA, “take” is defined as to “hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill.”

Exceptions authorized by the state to allow “take” require permits or memoranda of understanding and can be authorized for endangered species, threatened species, or candidate species for scientific, educational, or management purposes and for take incidental to otherwise lawful activities. Sections 1901 and 1913 of the CFGC provide that notification is required prior to disturbance. California Department of Fish and Wildlife (CDFW) is responsible for assessing development projects for their potential to impact listed species and their habitats.

State-listed special-status species are addressed through the issuance of a 2081 permit (Memorandum of Understanding). California Environmental Quality Act CEQA was established in 1970 as California's counterpart to the National Environmental Policy Act (NEPA). This statute requires state and local agencies to identify significant environmental impacts related to their actions and to avoid or mitigate those impacts, where feasible. A public agency must comply with CEQA when it undertakes an activity defined by CEQA as a "project." A project is an activity undertaken by a public agency or a private activity that must receive some discretionary approval (meaning that the agency has the authority to deny the requested permit or approval). The purpose of CEQA is to provide information as to whether the project may cause either a direct physical change in the environment or a reasonably foreseeable indirect change in the environment.

2.2.2 Natural Community Conservation Planning Act

In 1991, the California Natural Community Conservation Planning (NCCP) Act was approved and the NCCP Coastal Sage Scrub program was initiated in Southern California. California law (CFGC Section 2800 et seq.) established the NCCP program "to provide for regional protection and perpetuation of natural wildlife diversity while allowing compatible land use and appropriate development and growth." The NCCP Act encourages preparation of plans that address habitat conservation and management on an ecosystem basis rather than one species or habitat at a time.

2.2.3 California Fish and Game Code Sections 1600-1602

Pursuant to Division 2, Chapter 6, Section 1602 of the CFGC, CDFW regulates all diversions, obstructions, or changes to the natural flow or bed, channel or bank of any river, stream or lake that supports fish or wildlife. CDFW has jurisdiction over riparian habitats associated with watercourses. These jurisdictional waters are delineated by the outer edge of riparian vegetation or at the top of the bank of streams or lakes, whichever is wider. CDFW jurisdiction does not extend to tidal areas or isolated resources. A Lake or Streambed Alteration Application must be submitted to CDFW for "any activity that may substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake." CDFW reviews the proposed actions and, if necessary, submits (to the applicant) a proposal that includes measures to protect affected fish and wildlife resources. The final proposal that CDFW and the applicant mutually agree upon is termed the Lake or Streambed Alteration Agreement.

2.2.4 California Fish and Game Code Sections 3503, 3511, 3513, 3800, 4700, 5050, and 5515

Within California, fish, wildlife, and native plant resources are protected and managed by CDFW. The CFGC and/or CDFW are responsible for issuing permits for the take or possession of protected species. The following sections of the CFGC address protected species: Section 3511 (birds), Section 4700 (mammals), Section 5050 (reptiles and amphibians), and Section 5515 (fish). In addition, the protection of birds of prey is provided in Sections 3503, 3513, and 3800 of the CFGC.

2.2.5 Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act (Water Code Section 13000 et seq.) provides for statewide coordination of water quality regulations through establishment of the State Water Resources Control Board (WRCB) which serves as the statewide authority and nine separate RWQCBs which oversee water quality on a day-to-day basis. The WRCB is the primary agency responsible for protecting water quality in California. As discussed above, the WRCB regulates discharges to surface waters under the CWA and is responsible for administering the Porter-Cologne Water Quality Control Act. Pursuant to the Porter-Cologne Water Quality Control Act, the state is given authority to regulate waters of the state, which are defined as any surface water or groundwater, including saline waters. As such, any person proposing to discharge waste into a water body must first file a Report of Waste Discharge if the discharge could affect the water quality of the water body and Section 404 of the CWA is not applicable. “Waste” is partially defined as any waste substance associated with human habitation, including fill material discharged into water bodies.

2.2.6 Regional and Local Plans County of San Bernardino

Land Use Services, Planning Division According to the County’s Biotic Resources Overlay Map the project site is located within the Burrowing Owl (*Athene cunicularia*) Overlay Zone (County of San Bernardino 2012). The burrowing owl is listed as a species of special concern (SSC) by CDFW.

3.0 METHODOLOGY

The methodology consisted of: 1) a review of applicable federal, state, and local regulations; 2) a review of relevant background literature and resources (existing information); and 3) a general biological survey. Each effort was performed to map vegetation communities, determine presence/absence of habitat for sensitive plants or animals, determine and map potential habitat for the federally listed species DSFLF previously known to occur within the Survey Area, and to determine if potential jurisdictional waters and/or wetlands occur within the Survey Area.

3.1 LITERATURE REVIEW

NV5 conducted a preliminary literature review prior to conducting the general biological survey. The task involved reviewing available information about the Project Site and conducting database inquiries of the CDFW California Natural Diversity Database (CNDDB; CDFW 2020a, b, and c), the California Native Plant Society (CNPS) online Inventory of Rare and Endangered Plants of California (CNPS 2020), and the USFWS for existing records of species-status species occurrences within approximately 5 miles of the Survey Area boundary. Results of the CNDDB search are shown on Figure 5 (Appendix A).

The following desktop data sources were reviewed:

- Calflora (2020) wild plant observations
- Google Earth aerial photographs of the Survey Area and vicinity
- U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS) soils information (2020)
- CDFW California Natural Diversity Database (CNDDB, [CDFW 2020a])
- California Native Plant Society (CNPS), Rare Plant Program, Electronic Inventory (CNPSEI) of Rare and Endangered Plants of California (CNPS 2020)
- USFWS National Wetlands Inventory Website (USFWS 2020)

3.2 GENERAL BIOLOGICAL SURVEY

NV5 personnel conducted a general biological survey on June 5, 2020 to document the existing conditions and map biological resources present within the Survey Area. The biological survey occurred primarily on foot and binoculars were utilized as needed. During the biological survey, NV5 biologists mapped vegetation communities, mapped and/or recorded plant and animal observations, documented bird nests, evaluated the potential for the presence of special-status plant and animal species and their habitats, and documented any sensitive plant communities. Photographs were also taken to document site conditions and biological resources present at the time of the survey (Appendix D). An evaluation of potentially jurisdictional aquatic features that occur within the Survey

Area was also conducted to determine if a jurisdictional delineation would be recommended. These included the potential presence of jurisdictional waters of the United States and State of California, including wetlands. The DSFLF Conservation Area owned by the Rivers and Land Conservancy is inaccessible to the public and was not surveyed on foot. A binocular survey was conducted for bird nests on lattice towers within the 500-ft Buffer.

Two NV5 personnel conducted the general biological survey site visit on June 5 2020, and weather conditions during the visit were recorded (see Table 2). The survey for potential DSFLF habitat was led by permitted biologist Jeremiah George (TE-837760-8).

Table 2. Weather Conditions Onsite During Surveys

Date	Site Visit	Surveyors	Temperature (Start/End)	Precipitation	Cloud Cover	Wind (Start/End)
June 5, 2020	Survey	Robin Kinmont Jeremiah George (USFWS Permit TE-837760-8)	63 F 62 F	None Drizzle	100% 100%	2-5 mph S 2-3 mph S

The vegetation communities were mapped and classified in accordance with the Manual of California Vegetation (Sawyer et al. 2009). An inventory of all plant species observed was compiled (Plant Species Observations during the Survey, Appendix E).

Plant species nomenclature and taxonomy followed *The Jepson Manual: Vascular Plants of California, Second Edition* (Baldwin et al. 2012). Wildlife identification and nomenclature follow standard reference texts.

3.3 SPECIAL-STATUS SPECIES

The habitat requirements for each regionally occurring special-status species were assessed and compared to the type and quality of the habitats observed within the Survey Area during the general biological survey. An evaluation of the potential for other special-status species habitat to occur within the Survey Area was also conducted to determine if special-status protocol-level surveys would be recommended. The Survey Area was evaluated for DSFLF potential habitat.

4.0 RESULTS

A general biological survey was conducted to map vegetation communities and document plant and animal observations within the Survey Area. Incidental sightings of bird nests, or special-status species or habitats were also recorded. Survey results are provided below. Focused rare plant surveys or specific special-status species protocol-level surveys were not conducted. The evaluation of potential jurisdictional features within the Survey Area is provided below in Section 4.4.

4.1 VEGETATION

A total of 4 vegetation community types were observed and documented within the Survey Area during the general biological survey. The 102.6-acres of the Survey Area is comprised of Wild Oats and Annual Brome Grasslands (*Avena* spp. – *Bromus* spp. Herbaceous Semi-Natural Alliance) and California Buckwheat Scrub (*Eriogonum fasciculatum* Shrubland Alliance) (Sawyer et al. 2009).

All of the vegetation communities are represented within the Project Site. Of the 29.48 acres of the Project Site, a total of approximately 3.89 acres are comprised of California Buckwheat Scrub and 15.32 acres are comprised of Wild Oats and Annual Brome Grasslands habitats. Approximately 0.65

acre are Disturbed and 9.62 acres are Developed areas. The DSFLF Conservation Area is not accessible by the public and was not surveyed, therefore approximately 9.24 acres of the Buffer was not mapped for vegetation communities (Figure 6, Appendix A).

Acreages per vegetation community type that occur within the Project Site and 500-ft Buffer, as well as, the total acreages for each type within the Survey Area are shown on Table 3. Note that the Project Site and 500-ft Buffer comprise the total Survey Area. The vegetation communities mapped within the Survey Area are illustrated on Figure 6 (Appendix A). All plant observations within the Survey Area were documented (Appendix E, Plant Species Observations). Each vegetation community is described below.

Table 3 – Vegetation Communities Mapped within the Project Site, 500-ft Buffer and Survey Area

VEGETATATION COMMUNITY (Acronym)	PROJECT SITE (Acres)	500-FT BUFFER (Acres)	SURVEY AREA (Total Acres)
California Buckwheat Scrub (CBS)	3.89	-	**3.89**
Developed (DEV)	9.62	28.44	**38.05**
Disturbed (DIST)	0.65	11.13	**11.79**
Wild Oats and Annual Brome Grasslands (WOABG)	15.32	24.34	**39.66**
No Public Access-Vegetation Not Mapped	-	9.24	**9.24**
Total Acres	**29.48**	**73.15**	**102.63**

California Buckwheat Scrub (CBS)

(*Eriogonum fasciculatum* Shrubland Alliance)

This scrub community is characterized by California buckwheat greater than 50% relative cover in the shrub canopy with other shrubs if present, less than 50% relative cover (Evens and San 2005, Keeler-Wolf and Evens 2006). Characteristic species include: California buckwheat, California sagebrush (*Artemisia californica*), coyote brush (*Baccharis pilularis*), sticky monkey-flower (*Diplacus aurantiacus*), brittlebush (*Encelia farinosa*), coastal goldenbush (*Isocoma mensiesii*), deerweed (*Acmispon glaber*), chaparral mallow (*Malacothamnus fasciculatus*), white sage (*Saliva apiana*), or black sage (*Salvia mellifera*).

Developed (DEV)

These areas include hardscaped portions within the Survey Area, and include paved roads and parking lots, and buildings.

Disturbed (DIST)

Disturbed areas include dirt and gravel roads, dirt and gravel parking areas, equipment locations, and storage areas where vegetation is very low and occupies less than 10% vegetative cover or not present. Disturbed areas are also present within the Agua Mansa Properties water treatment plant parcel to the north.

Wild Oats and Annual Brome Grasslands (WOABG)

(*Avena* spp. – *Bromus* spp. Herbaceous Semi-Natural Alliance)

This grassland classification is composed of many native and non-native annual and perennial species; composition varies among stands. Grass species are dominant or codominant with other non-natives in the herbaceaous layer such as Australian saltbush (*Atriplex semibaccata*) and barley grasses (*Hordeum* spp.). Emergent trees and shrubs may be present at low cover. Characteristic species include: slender wild oat (*Avena barbata*), wild oat (*Avena fatua*), purple false brome

(*Brachypodium distachyon*), greater quaking grass (*Briza maxima*), ripgut brome (*Bromus diandrus*), soft chess (*Bromus hordeaceus*), and/or hare barley (*Hordeum murinum*).

4.2 WILDLIFE

Wildlife activity was generally low during the general biological survey. Bird species observed within the Survey Area include lesser goldfinch (*Spinus psaltria*), Bullock's oriole (*Icterus bullockii*), northern mockingbird (*Mimus polyglottos*), Say's phoebe (*Sayornis saya*), red-tailed hawk (*Buteo jamaicensis*) house finch (*Haemorhous mexicanus*), western kingbird (*Tyrannus verticalis*), and northern rough-winged swallow (*Stelgidopteryx serripennis*). A few mammals were also observed and include Audobon's rabbit (*Sylvilagus audubonii*) and California ground squirrel (*Otospermophilus beecheyi*). Coyote (*Canis latrans*) sign was also observed. One reptile was observed which included the western fence lizard (*Sceloporus occidentalis*).

An active Red-tailed hawk nest was observed in the SCE lattice tower at the northern end of the Survey Area just outside of the Project Site (Figure 7, Appendix A). Two adults with two fledglings were observed occupying the lattice tower with the nest and the lattice tower immediately adjacent. Two inactive corvid nests were observed on the cross-arms of the two SCE lattice towers at the northeastern boundary just outside of the Project Area. All wildlife species observed within the Survey Area were documented.

4.3 SPECIAL-STATUS SPECIES

Local, state, and federal agencies regulate special-status species and may require an assessment of their presence or potential presence be conducted prior to the approval of proposed development on a property. Assessments for the potential occurrence of special-status species are based upon known ranges, habitat preferences, species occurrence records from the CNDDB, the presence of known occurrences in the vicinity of the Survey Area, and previous reports for the Project Site. A CNNDB records search was performed for 5-miles surrounding the Survey Area. The species search results were combined into a table and analyzed to determine if known species records occur and / or if potential habitat is present within the Survey Area. See Appendix F for the Species Potential to Occur Table. A 5-mile search was also performed for California Fish and Wildlife Observations (CFWO). In order to display search results within and adjacent to the Survey Area a 1-mile buffer of the search area is shown, Special-status plants and animals search results within 1-mile of the Survey Area are shown on Figure 5 (Appendix A).

For the purpose of this Report, special-status species are those plants and animals listed, proposed for listing, or candidates for listing as Threatened or Endangered by the USFWS under the ESA; those listed or candidates for listing as Rare, Threatened, Endangered under CESA or the Native Plant Protection Act; those identified as Fully Protected under Sections 3511, 4700, 5050, and 5515 of the CFGC; SSC identified by the CDFW; and plants occurring on Ranks 1 and 2 of the California Native Plant Society's California Rare Plant Rank system.

4.3.1 Special-Status Plant Species

No special-status plant species were detected during the general biological surveys.

4.3.2 Special-Status Wildlife Species

4.3.2.1 Delhi Sands Flower-loving Fly

The Delhi Sands flower-loving fly (DSFLF) was listed as an endangered species by the USFWS on September 23, 1993 (58 Federal Register 49881) and is protected under the provisions of the ESA of 1973, as amended (USFWS 1993). The DSFLF is currently placed in the Dipteran (fly) family Mydidae (mydid flies) and is brown-orange in color, with dark brown ovoid spots on the dorsal surface of the abdomen. Adults are approximately one inch in size. This species is a rapid flyer with a long proboscis utilized for obtaining nectar in a manner superficially similar to a hummingbird. The peak adult flight period lasts on average several weeks during July, August, and September. The historic range of the DSFLF is estimated to have been approximately 40 square miles in northwestern Riverside and southwestern San Bernardino counties (USFWS 1996). Habitat has been lost and fragmented by a variety of activities including agriculture, livestock operations, urbanization, sandmining, illegal dumping, off-road vehicles, and non-native plant invasion. It is estimated that the DSFLF's present distribution is less than a few percent of its former range (USFWS 2006). Known current DSFLF populations occur in isolated pockets of habitat surrounded by urban development and invasive exotic vegetation (USFWS 1997, 2006).

DSFLF habitat is limited to areas that include Delhi fine sand. The USFWS has identified the presence of Delhi sand soils as the baseline criterion for the determination of suitable or potentially suitable habitat for this species (USFWS, 1996). Fine unconsolidated sand is required for oviposition (egg laying) as females must insert their abdomens deep into the sand during this process (Rogers and Mattoni 1993). All species of flower-loving flies (genus Rhaphiomidas) are restricted to sandy soils. The larval and pupal portion of the DSFLF's life cycle is largely unknown. Larval and pupal development takes place in the sandy soils. The length of time for larval development in DSFLF is unknown but captive-rearing experiments with the closely related Valley mydas fly (*Rhaphiomidas trochilus*) showed that species is capable of indeterminate development, molting two to three time per year for at least three years prior to pupation (Osborne and Ballmer in USFWS 2006). The specifics of the larval diet are unknown. Appropriate vegetative cover is often sparse (0 to 50% cover) to absent in blowout areas of dune formations and sand pits. However, populations have been found within habitat that has a higher cover of nonnative annuals. Perennial plant species present at most occupied DSFLF habitat includes California buckwheat (*E. f.* var. *polifolium*), California croton (*Croton californicus*), and telegraph weed (*Heterotheca grandiflora*). Areas with known extant, historically documented DSFLF or presumed appropriate habitat within the range of Delhi fine sands have been divided into three recovery units the Colton, Jurupa, and Ontario Recovery Units. The Project Site is within the Colton Recovery Unit.

Potential habitat for DSFLF was mapped within the Survey Area (Figure 7; Appendix A). The DSFLF has been historically recorded within the Project Site and adjacent parcels. The DSFLF is assumed to still be extant onsite per previous survey results for the area and the presence of suitable habitat. Since the DSFLF is known to occur nearby and Dehli fine sands soil occurs within the Survey Area, there is a potential for DSFLF to occur within the Project Site and 500-ft Buffer. Assuming compliance with the Habitat Conservation Plan and all requirements of the Angelus Block et. al. Incidental Take Permit and associated Implementation Agreement have been met, no DSFLF surveys are recommended at this time. See Appendix B for the Amendment to the Implementation Agreement and associated Federal Fish and Wildlife Incidental Take Permit.

No special-status wildlife species were observed during the survey.

4.4 POTENTIAL JURISDICTIONAL FEATURES

No potential jurisdictional features were observed within the Project Site or 500-ft Buffer during the surveys and no jurisdictional delineation was performed.

5.0 LIMITATIONS AND ASSUMPTIONS

The findings summarized in this Report are the results of a general biological survey to document biological resources within the Survey Area and it is assumed that some resources were not present or obvious at the time the field work was conducted. The general biological survey was conducted during late spring, and some late blooming plants may not have been present or identifiable at the time of surveys. No potential jurisdictional features were observed within the Survey Area and no jurisdictional delineation was performed.

6.0 RECOMMENDATIONS

Assuming all requirements of the Angelus Block Incidental Take Permit (ITP) and associated implementation agreement, including the amendment to the implementation agreement, have been met, no DSFLF surveys are recommended at this time.

However, consultation with state and County wildlife agencies is recommended to determine if further assessment is appropriate, due to identification of appropriate habitat for the Los Angeles Pocket Mouse (*Perognathus longimembris brevinasus*), and that the San Bernardino County Burrowing Owl (*Athene cunicularia*) Survey area overlay includes this area of the County. No special-status plant or wildlife species were detected during the general biological assessment of the site.

7.0 REFERENCES

Baldwin, B.G., D.H. Goldman, D.J. Keil, R. Patterson, T.J. Rosatti, and D.H. Wilken. 2012. The Jepson Manual: Vascular Plants of California. Second Edition. Univ. of California Press, Berkeley.

Calflora. 2020. California wild plants observation online database. Available at: https://calflora.org//. Accessed: 4 June 2020.

California Department of Fish and Wildlife (CDFW). 2020a. California Natural Diversity Database (CNDDB) RareFind 5 online mapping and database. Query of Project Site and vicinity. Available by subscription only at: https://www.wildlife.ca.gov/Data/CNDDB/Maps-and-Data. Accessed: 4 June 2020.

CDFW 2020b. CNDDB State and Federally Listed Endangered, Threatened, and Rare Plants of California. Accessed: 4 June 2020.

CDFW. 2020c. CNDDB Special Animals List. Accessed: 4 June 2020.

California Native Plant Society (CNPS). 2020. Inventory of Rare and Endangered Plants of California online database. Available at: http://rareplants.cnps.org/. Accessed: 4 June 2020.

City. 1986. Agua Mansa Specific Plan: https://www.yourrialto.com/wp-content/uploads/2015/06/Agua-Mansa-Specific-Plan-1.pdf

City. 2010. Rialto General Plan: http://yourrialto.com/wp-content/uploads/2016/08/General-Plan-Update-2010.pdf

County of San Bernardino. 2012. San Bernardino County Biotic Resources Overlay Map. December 4, 2012. http://www.sbcounty.gov/Uploads/lus/BioMaps/cnty_all_biotic_resources_map_final.pdf

Evens and San 2005. Evens, J., and S. San. Vegetation Alliances of the San Dieguito River Park region, San Diego County, California. Unpublished report, revised 2006. California Native Plant Society, Sacramento, CA.

Keeler-Wolf and Evens 2006. Keeler-Wolf, T., and J. M. Evans. Vegetation classification of the Santa Monica Mountains. National Recreation Area and environs In Tiszler, J. and P.W. Rundel. 2007. Santa Monica Mountains: Biogeography and cultural history. In Flora and ecology of the Santa Monica Mountains: Proceedings of the 32nd annual Southern California Botanists symposium, ed. D.A. Knapp, 1-17. Southern California Botanists Special Publication No. 4, Fullerton, CA.

Michael Brandman Associates. 1999. Final Habitat Conservation Plan. In Support of the Issuance of a Section 10(a) Permit for Incidental Take of the Endangered Delhi Sands Flower-loving Fly in Connection with the Development of Approximately 65 Acres in the City of Rialto, California. Prepared for the Edward Antonini Residuary Trust Angelus Block Company, Inc., and E-Z Mix, Inc. July 1, 1999.

Quigley, John. 2020. Personal communication regarding previously vegetation treatments on site June 5, 2020, with Robin Kinmont NV5.

Rogers, R. and R. Mattoni 1993. Observations on the natural history and conservation biology of the giant flower loving flies, Rhaphiomidas (*Diptera: Apioceridae*). Dipterological Research 4(l-2):21-34.

Sawyer et al. 2009. John O. Sawyer, Todd Keeler-Wolf, and Julie M. Evens. A Manual of California Vegetation. Second Edition. Accessed online edition on June 8, 2020: http://vegetation.cnps.org/.

U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS). 2020. Web Soil Survey Online Mapping Tool. Query of Survey Area. Available at: https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx. Accessed: 4 June 2020.

United States Fish & Wildlife Service (USFWS). 1993. Endangered and Threatened Wildlife and Plants; Determination of Endangered Status for the Delhi Sands Flower-loving Fly. Final Rule. Federal Register Volume 58: 49881-49887. September 23.

USFWS. 1996. Interim General Survey Guidelines for the Delhi Sands Flower-Loving Fly.

USFWS. 1997. Delhi sands flower-loving fly (*Rhaphiomidas terminates abdominalis*) recovery plan. U.S. Fish & Wildlife Service, Portland, Oregon. 1-51.

USFWS. 2006. Delhi Sands Flower-loving Fly (*Rhaphiomidas terminates abdominalis*) 5-Year Review: Summary and Evaluation. Carlsbad Fish and Wildlife Office Carlsbad, California. 1-29.

USFWS. 2020. National Wetlands Inventory, Wetlands Data KML (last modified on February 27, 2020). Available at: https://www.fws.gov/wetlands/data/Mapper.html Accessed: 29 June 2020.

Western Regional Climate Center (WRCC). 2020. Available at: https://wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca3120

APPENDICES

Appendix A – Figures

NV5

15092 Avenue of Science, Suite 200
San Diego, California 92128
PH: 858-927-3626 FX: 858-385-0400

Figure 1 - Project Vicinity

Biological Resources Study

Angelus Block Company, Inc.

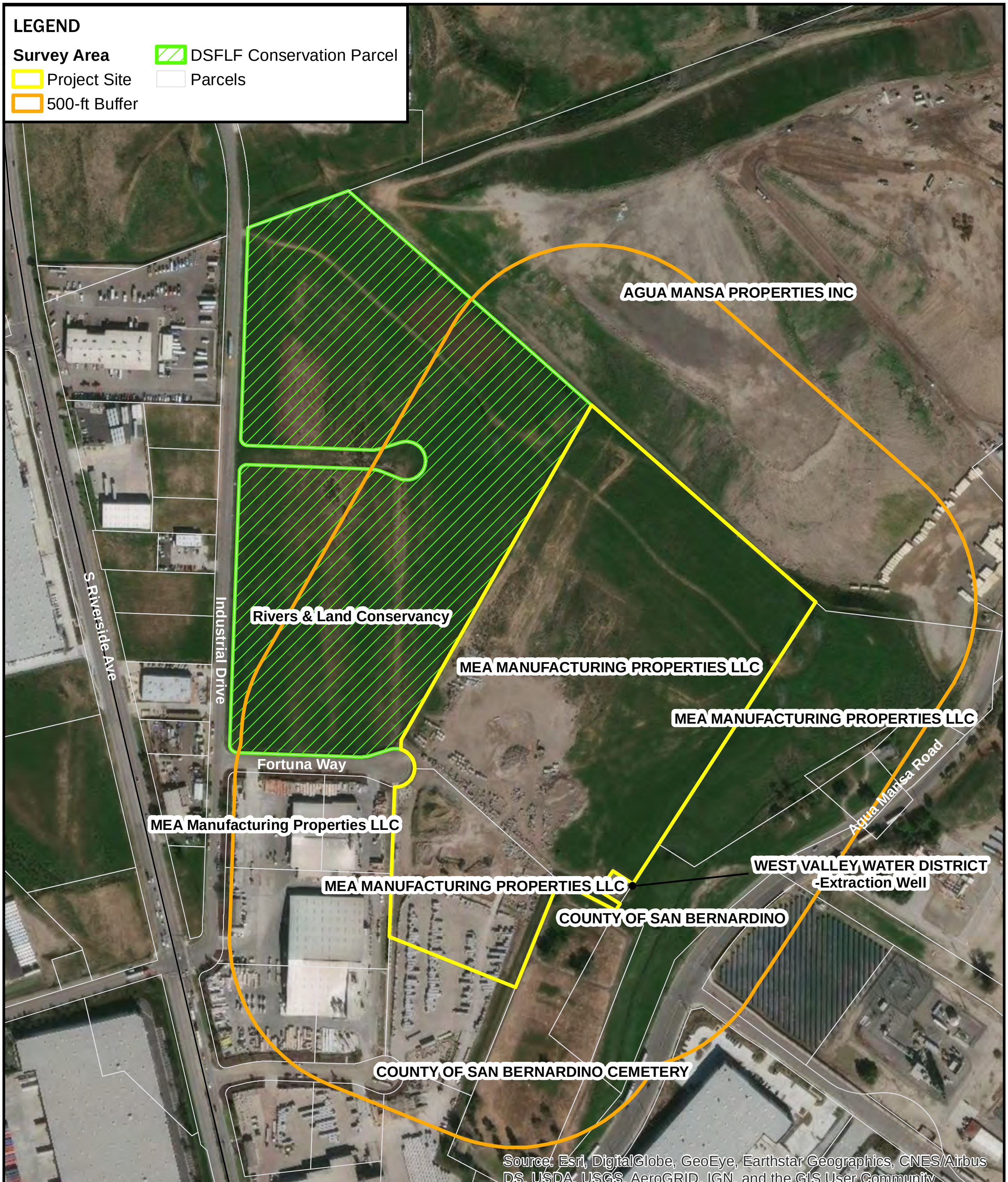
Rialto, Riverside County, California

NV5
15092 Avenue of Science, Suite 200
San Diego, California 92128
PH: 858-927-3626 FX: 858-385-0400

Figure 2 - Project Location

Biological Resources Study
Angelus Block Company, Inc.
Rialto, Riverside County, California

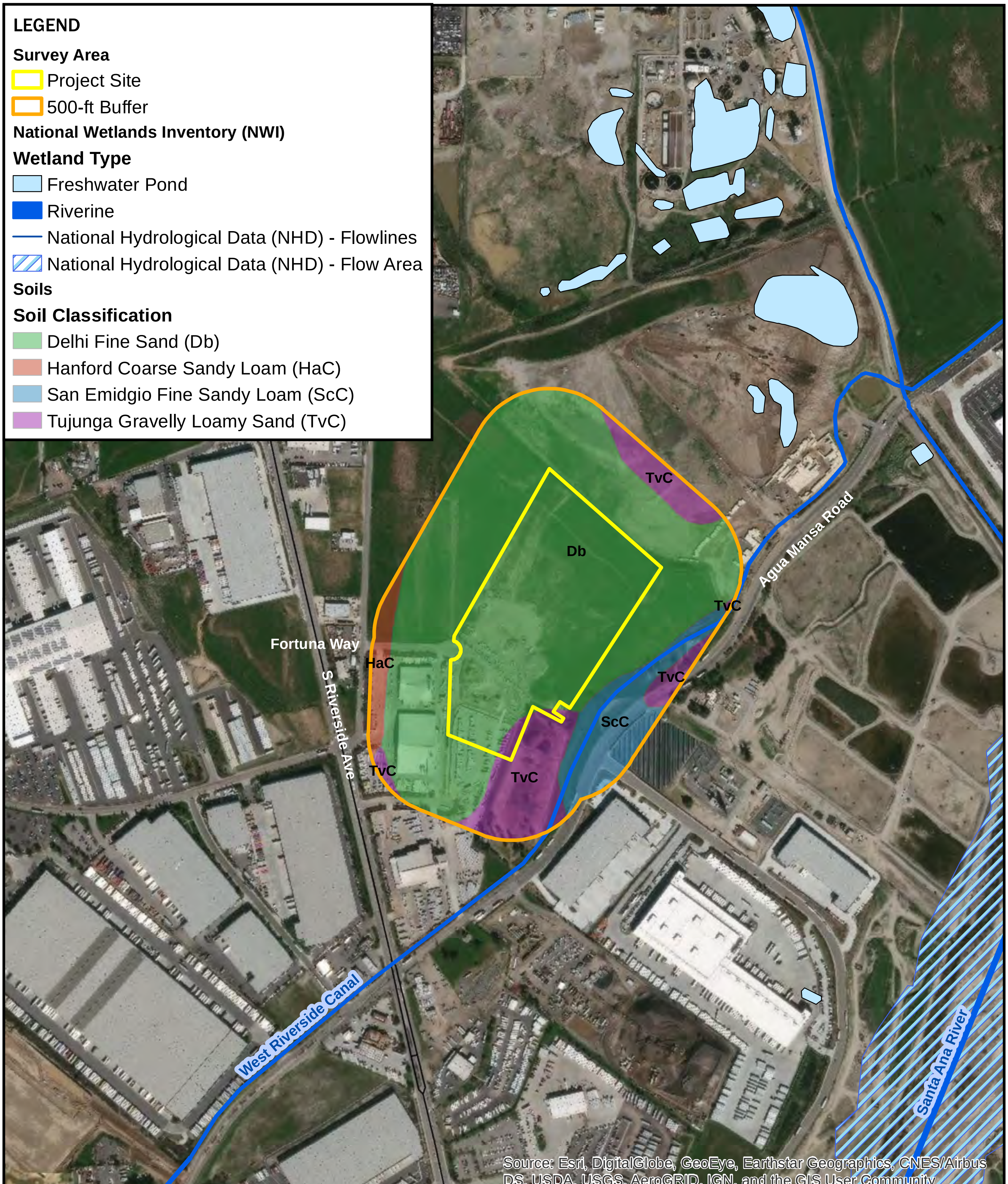
0 0.175 0.35 Miles
N



NV5
15092 Avenue of Science, Suite 200
San Diego, California 92128
PH: 858-927-3626 FX: 858-385-0400

Figure 3 - Parcels and Land Ownership within and Adjacent to the Survey Area

Biological Resources Study
Angelus Block Company, Inc.
Rialto, Riverside County, California



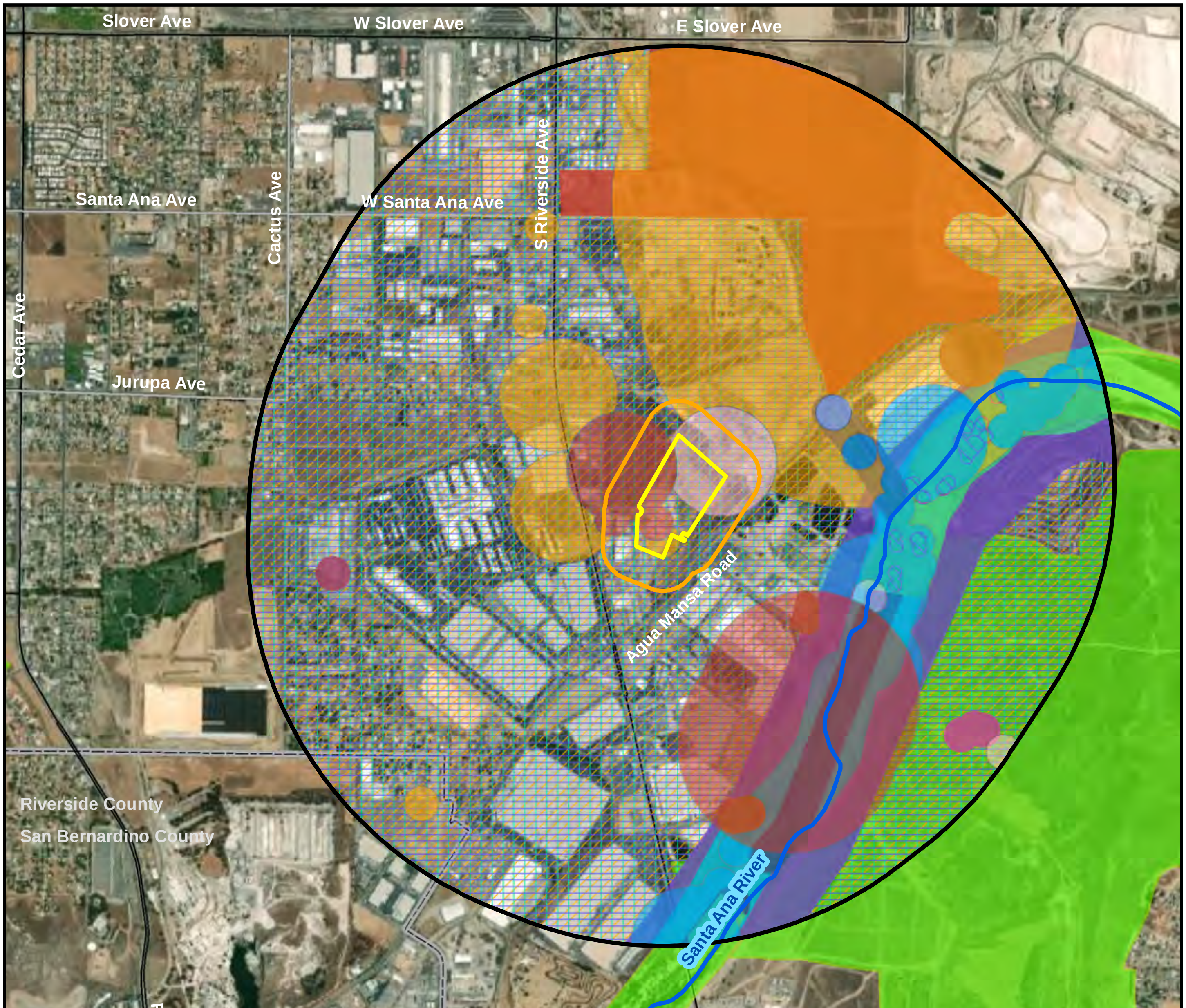
15092 Avenue of Science, Suite 200
San Diego, California 92128
PH: 858-927-3626 FX: 858-385-0400

Figure 4 - Wetlands, Waters and Soils within or Adjacent to the Survey Area

Biological Resources Study
Angelus Block Company, Inc.
Rialto, Riverside County, California

0 0.075 0.15 Miles

N



LEGEND

Survey Area
- Project Site
- 500-ft Buffer
- CNDDB/CFWO 1-Mile Search Area
- Major Rivers and Creeks

California Fish and Wildlife-Observations (CFWO)
Common Name
- Delhi Sands flower-loving fly
- coastal California gnatcatcher
- least Bell's vireo
- Los Angeles pocket mouse
- Santa Ana sucker

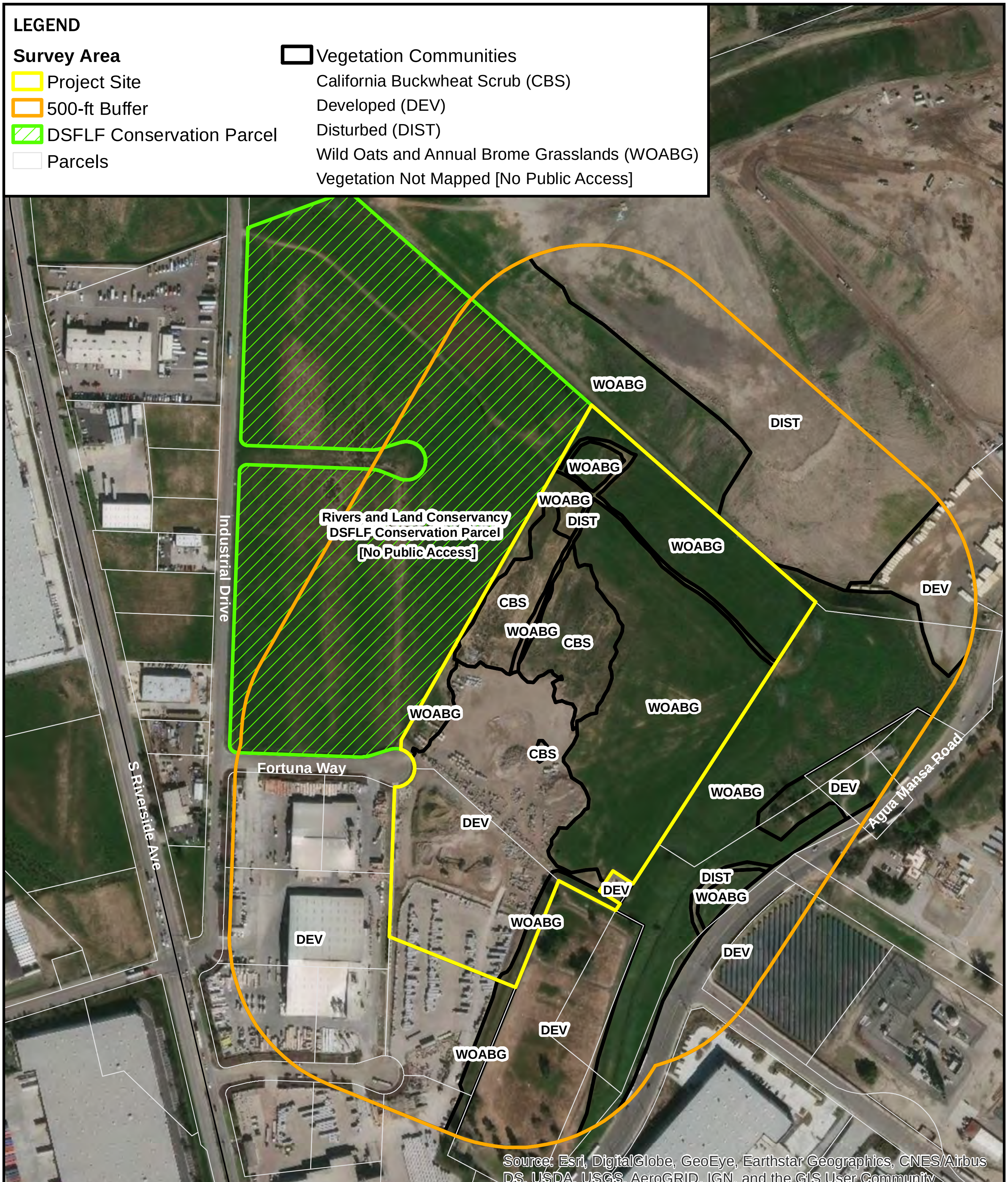
California Natural Diversity Database (CNDDB)
Common Name
- arroyo chub
- burrowing owl
- California glossy snake
- Delhi Sands flower-loving fly
- least Bell's vireo
- Los Angeles pocket mouse
- marsh sandwort
- mesa horkelia
- orange-throated whiptail
- Pringle's monardella
- salt marsh bird's-beak
- Santa Ana River woollystar
- Santa Ana sucker
- southern California legless lizard
- steelhead - southern California DPS
- western yellow-billed cuckoo
- USFWS Critical Habitat
- San Bernardino County

NV5
15092 Avenue of Science, Suite 200
San Diego, California 92128
PH: 858-927-3626 FX: 858-385-0400

Figure 5 - Special-status Species Search Results within 1-mile of the Survey Area

Biological Resources Study
Angelus Block Company, Inc.
Rialto, Riverside County, California

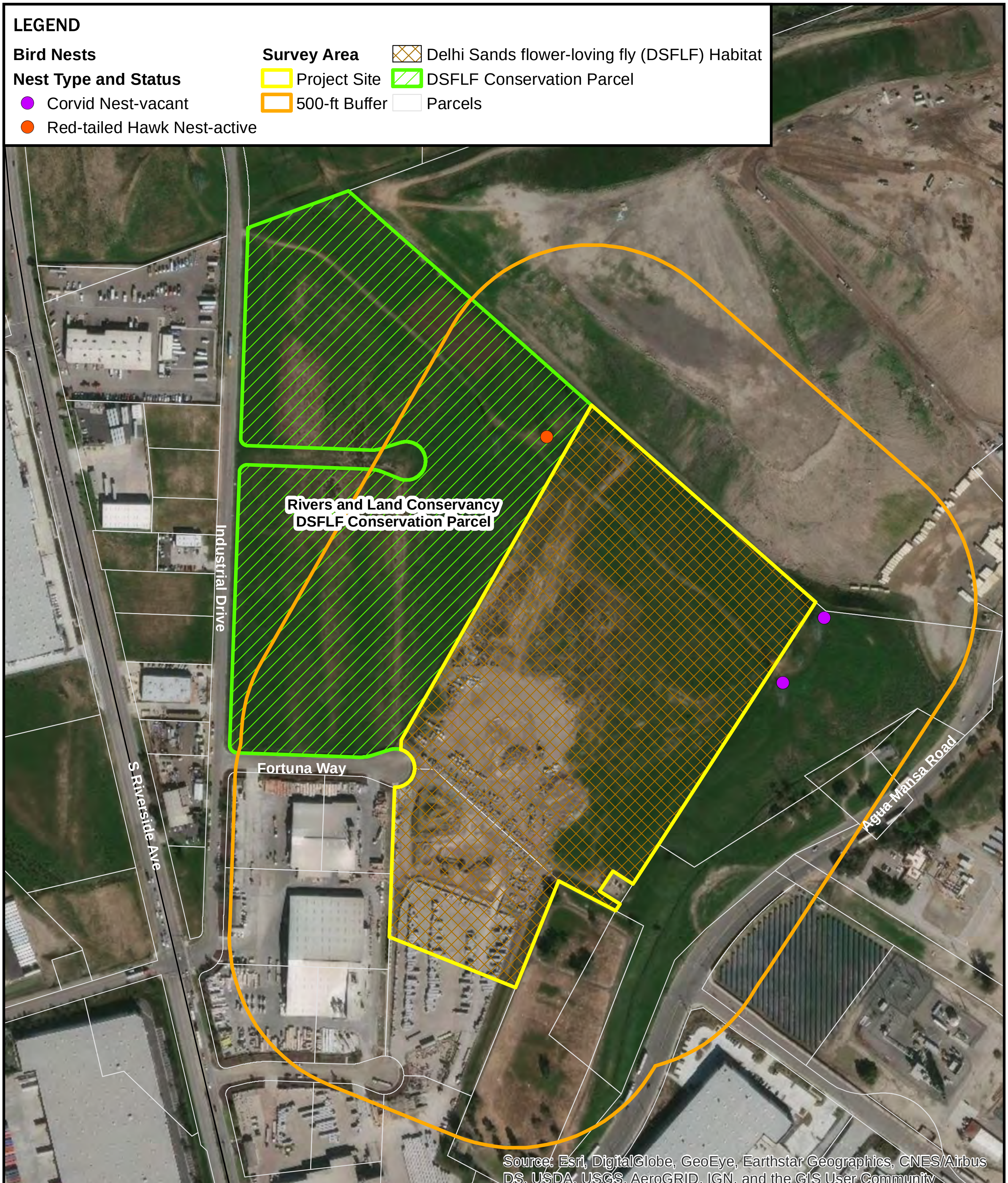
N
0 0.2 0.4 Miles



NV5
15092 Avenue of Science, Suite 200
San Diego, California 92128
PH: 858-927-3626 FX: 858-385-0400

Figure 6 - Vegetation Communities within the Survey Area

Biological Resources Study
Angelus Block Company, Inc.
Rialto, Riverside County, California



NV5
15092 Avenue of Science, Suite 200
San Diego, California 92128
PH: 858-927-3626 FX: 858-385-0400

Figure 7 - DSFLF Habitat and Survey Results

Biological Resources Study
Angelus Block Company, Inc.
Rialto, Riverside County, California

0 0.0375 0.075 Miles
N

Appendix B – Implementation Agreement Amendment and Federal Fish and Wildlife Permit

O'NEIL LLP

ATTORNEYS AT LAW

KATHLEEN A. DONAHUE
DEAN DUNN-RANKIN
SANDRA A. GALLE
WILLIAM E. HALLE
ANDREW K. HARTZELL
LAWRENCE J. HILTON

19900 MACARTHUR BOULEVARD, SUITE 1050
IRVINE, CALIFORNIA 92612
(949) 798-0500 • (949) 798-0511 (FAX)
WEBSITE: www.oneil-llp.com

WRITER'S DIRECT DIAL: (949) 798-0714
EMAIL: ahartzell@oneil-llp.com

JOHN D. HUDSON
DENNIS D. O'NEIL
JAY F. PALCHIKOFF
PAUL A. ROWE
WILLIAM L. TWOMEY
JOHN P. YEAGER

October 17, 2014

G. Mendel Stewart
Field Supervisor
U.S. Fish and Wildlife Service
Carlsbad Fish and Wildlife Office
2177 Salk Avenue, Suite 250
Carlsbad, CA 92008

Re: Amendment to the Implementing Agreement by and among The Edward Antonini Residuary Trust, Angelus Block Co., Inc., E-Z Mix, Inc. and the United States Fish and Wildlife Service, dated August 27, 1999 (Habitat Conservation Plan for 30.5 acres located in City of Rialto, San Bernardino County, California) (FWS-13B0302-14CPA0241)

Dear Mr. Stewart:

Enclosed please find a copy of the written consents to the Service's proposed amendment to the above-referenced Implementing Agreement contained in your letter of September 23, 2014. The enclosed written consents are from the signatories to the original Implementing Agreement dated August 27, 1999. As such, the Implementing Agreement is now amended as per Section 21.0 of that agreement.

This written consent to the September 23, 2014 amendment to the Implementing Agreement should be maintained with the original Implementing Agreement in the U.S. Fish and Wildlife Service's files.

#145375 v1 3011.6 10/17/2014

I appreciate the efforts of your staff, in particular Karen Goebel and Mary Beth Woulfe, in relation to the Angelus Block Co., Inc. Habitat Conservation Plan and Conservation Bank. Should you have any questions regarding the enclosed, please do not hesitate to contact me.

Sincerely,

Andrew K. Hartzell

AKH/mlc
Encl.
cc: Ken Corey, Asst. Field Supervisor, Palm Springs Fish & Wildlife Office (w/Encl.)
Karen Goebel, Asst. Field Supervisor, Carlsbad Fish & Wildlife Office (w/Encl.)
Mary Beth Woulfe, Carlsbad Fish & Wildlife Office (w/Encl.)
Marla Richmond (w/Encl.)

Consent to the Amendment to the Implementing Agreement by and among The Edward Antonini Residuary Trust, Angelus Block Co., Inc., E-Z Mix, Inc. and the United States Fish and Wildlife Service, dated August 27, 1999

The undersigned are parties to the Implementing Agreement by and among The Edward Antonini Residuary Trust, Angelus Block Co., Inc., E-Z Mix, Inc. and the United States Fish and Wildlife Service, dated August 27, 1999 (the "IA"). The IA relates to the establishment of a program for the conservation of the endangered Delhi Sands Flower-loving Fly in connection with development of approximately 65 acres for industrial uses in the City of Rialto, California.

By letter dated September 23, 2014, the U.S. Fish and Wildlife Service offered an amendment to the IA. That written offer of an amendment and the amendment itself is attached hereto as Exhibit A and incorporated herein by reference (the "Amendment"). Section 21.0 of the IA provides that the IA may be amended only with the written consent of each of the parties to the IA.

The U.S. Fish and Wildlife Service has provided its written consent to the Amendment as shown on Exhibit A. The undersigned hereby consent to the Amendment as proposed and described in Exhibit A.

Mario E. Antonini, Trustee
The Edward Antonini Residuary Trust

Date: Oct. 13, 2014

Angelus Block Co., Inc.

Date: Oct. 13, 2014

E-Z Mix, Inc.

Date: Oct. 13, 2014

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Carlsbad Fish and Wildlife Office
2177 Salk Avenue, Suite 250
Carlsbad, California 92008

In Reply Refer To:
FWS-13B0302-14CPA0241

SEP 23 2014

Ms. Marla Richmond
Angelus Block Company, Inc.
11374 Tuxford Street
Sun Valley, California 91352

Mr. Andrew Hartzell
O'Neil LLP
19900 MaCarthur Boulevard, Suite 1050
Irvine, California 92612

Subject: Letter Amendment to the Implementing Agreement for the Angelus Block Company, Inc. Habitat Conservation Plan, City of Rialto, San Bernardino County, California

Dear Ms. Richmond and Mr. Hartzell:

This letter serves as an amendment to the *Implementing Agreement by and among The Edward Antonini Residuary Trust, Angelus Block Company, Inc., E-Z Mix, Inc., and the U.S. Fish and Wildlife Service* (IA). Consistent with the Angelus Block, Inc. Habitat Conservation Plan (Angelus Block, Inc. HCP) and associated IA, the U.S. Fish and Wildlife Service (Service) and the Permittees have selected the Riverside Land Conservancy (RLC) as the Conservation Organization responsible for the 30.5-acre Conservation Area. Exhibit 3 of the IA includes the Conveyance Agreement and Declaration of Special Land Use Restrictions (SLUR). The SLUR has been modified slightly to accommodate the conveyance of the land and responsibilities to RLC ("modified SLUR"; enclosure). This letter amendment will become effective once the enclosed modified SLUR is executed.

This letter amendment memorializes Service concurrence with the language in the modified SLUR and our determination that the changes are consistent with the intent of the Angelus Block, Inc. HCP and IA. As such, the Service's commitments and obligations to the Permittees (and any successors) identified in the IA will remain in full force and effect subsequent to the transfer of the 30.5-acre Conservation Area to the RLC and irrespective of RLC's (and any successors') management performance and associated effects on the Conservation Area.

Specifically, the Service agrees that:

(1) The Antonini Trust's obligations in Section 9.1(d) of the IA with regard to the execution of the Conveyance Agreement (including the recordation of the SLUR), in substantially the form as Exhibit 3 to the IA, have been fully complied with by executing the Conveyance Agreement and modified SLUR.

(2) The modified SLUR, and the selection of the RLC as the Conservation Organization responsible for the implementation of the Angelus Block, Inc. HCP with respect to the 30.5-acres Conservation Area, does not change the conditions of the IA with respect to the permit suspension, revocation, or termination nor does it change the Permittees' (and any successors') rights associated with the 5-acre Conservation Bank referenced in Section 10 of the IA irrespective of RLC (and any successors') performance and associated effects on the 30.5-acre Conservation Area.

Further, we acknowledge and honor the availability of the conservation bank credits and ability of the Permittees to sell the 5 acres of conservation credits within the 5-acre Conservation Bank referenced in Section 10 of the IA for the direct and indirect impacts to the Delhi Sands flower-loving fly (*Rhaphiomidas terminatus abdominalis*) or its habitat on properties within the Credit Area. The Service will enter the existence of the 5-acre Conservation Bank into the Regulatory In-lieu Fee and Bank Information Tracking System (RIBITS) program, which is accessible to the public and identifies mitigation banks approved by the Service and the U.S. Army Corps of Engineers. The Service agrees to recognize and honor the use and availability of these 5 acres of conservation credits to serve as mitigation for adverse biological impacts to land within the Credit Area consistent with the HCP and Section 10.3 of the IA.

Thank you for your efforts to complete the Conveyance Agreement and SLUR. We look forward to expeditiously completing the transfer of the 30.5-acre Conservation Area and the associated responsibilities to RLC, as described in the Angelus Block, Inc. HCP and IA. If you have any questions, please contact Mary Beth Woulfe at (760) 431-9440, extension 294.

Sincerely,

G. Mendel Stewart

G. Mendel Stewart
Field Supervisor

Enclosure

cc: Ken Corey, Assistant Field Supervisor, Palm Springs Fish and Wildlife Office
Gail Egenes, Riverside Land Conservancy

RECORDING REQUESTED BY:

WHEN RECORDED MAIL TO:

(Space Above For Recorder's Use)

DECLARATION OF SPECIAL LAND USE RESTRICTIONS

THIS DECLARATION OF SPECIAL LAND USE RESTRICTIONS (this "Declaration") is made as of _____________, 2014, by and between THE EDWARD ANTONINI RESIDUARY TRUST ("Declarant"), and RIVERSIDE LAND CONSERVANCY, a California non-profit public benefit corporation ("Grantee"), with reference to the following facts:

A. Pursuant to a Conveyance Agreement and Escrow Instructions between Grantee and Declarant dated as of ___________ __, 2014, Grantee is concurrently herewith acquiring from Declarant the real property (the "Land") situated in San Bernardino County, California, described and/or depicted on EXHIBIT A attached hereto and by this reference incorporated herein.

B. The Land provides habitat for the Delhi Sands flower-loving fly ("DSF") and suitable or potentially restorable habitat for other wildlife species (which species may or may not presently occupy such habitat), and possesses other wildlife and native habitat values (collectively, "conservation values") of great importance to Declarant, Grantee, the people of San Bernardino County and the people of the State of California.

C. The Land is situated adjacent to that certain real property described and/or depicted on EXHIBIT B attached hereto (the "Benefitted Property"), which Benefitted Property is or may be developed by Declarant for commercial, industrial and/or other uses.

D. It is the purpose of this Declaration to (i) enforceably restrict the use of the Land to conservation purposes and to protect the conservation values of the Land and to satisfy certain conditions set forth in that certain Implementing Agreement by and among Declarant, Angelus Block Co., Inc., E-Z Mix, Inc. and the United States Fish and Wildlife Service ("USFWS") dated August 27, 1999 ("Implementing Agreement") for Section 10(a)(1)(B) Permit Nos. TE015985-0, TE015986-0, and TE015987-0, and (ii) to ensure that the Grantee will manage and maintain the Land in accordance with the terms of the Habitat Conservation Plan prepared for Declarant, Angelus Block Company, Inc., and E-Z Mix, Inc., dated July 1, 1999 ("HCP"), which HCP is the subject of the Implementing Agreement.

E. Grantee has represented to Declarant that it has the expertise and ability to maintain, operate and manage the Land so as to enhance and protect the conservation values of the Land in accordance with the terms of this Declaration, the Implementing Agreement, and the HCP, and Declarant is conveying the Land to Grantee on the basis of Grantee's agreement to maintain, operate and manage the Land solely for such purposes (collectively, the "Conservation Purpose") and to comply with the transfer, use and development restrictions set forth herein (collectively, the "Restrictions").

NOW, THEREFORE, in consideration of the foregoing (including the conveyance of the Land by Declarant to Grantee), and other good and valuable consideration, the receipt and adequacy of which are hereby acknowledged by Grantee, the parties hereto agree as follows:

ARTICLE I

GENERAL PROVISIONS

1.1 Certain Definitions.

(a) "Declarant" shall mean THE EDWARD ANTONINI RESIDUARY TRUST as identified above and all successors, assigns or designees who shall assume the obligation, and to whom THE EDWARD ANTONINI RESIDUARY TRUST shall specifically assign in writing the right, to enforce these Restrictions.

(b) "Grantee" shall mean the Grantee identified above and each and every successor, assign, owner, lessee, licensee or other occupant during its ownership or occupancy of the Land or any portion thereof or interest therein, as the context may require.

ARTICLE II

GENERAL AND SPECIFIC USE RESTRICTIONS

2.1 General Use Restrictions.

(a) Conservation Purpose; Use Limitation. Grantee shall use, manage, operate and maintain the Land solely for the Conservation Purpose and shall not use or develop or attempt to use or develop the Land or any portion thereof for any other purpose unless expressly approved by Declarant and USFWS, which approval may be withheld by Declarant in its sole discretion.

(b) Development or Use. Without limitation on the foregoing, Grantee shall not construct, maintain, operate or use, or affirmatively permit any third party to construct, maintain, operate or use, any structure or improvements on the Land except for those structures or improvements allowed by existing matters of record, including, but not limited to, that certain easement in favor of Southern California Edison.

2.2 Specific Requirements.

(a) Commencement of Conservation Activities. Grantee shall, from and after the date of recordation of this Declaration, commensurate with available Funding (as hereinafter defined): (i) commence and diligently pursue Conservation Purpose activities on the Land, and (ii) maintain, manage (which activities may include the enhancement or restoration of native habitats, vegetation or ecological communities), and monitor the Land in a manner fully consistent with the terms of the HCP and Implementing Agreement, and shall abide by, and fully comply with, all of the terms in the HCP applicable to the "conservation organization," as that term is used in the HCP. As provided herein, Grantee's obligations hereunder are commensurate with available Funding; in other words, Grantee's obligations hereunder are limited to those obligations that can be satisfied out of the Funding.

(b) No Transfer or Encumbrance. Grantee shall not consummate any sale, lease, conveyance, transfer, exchange, encumbrance or other disposition of the Land or any portion thereof or facilities thereon, whether by agreement for sale or in any other manner (herein collectively, an "assignment") for any purpose without first obtaining the written approval of the USFWS and Declarant. Declarant's approval shall not be unreasonably withheld. Without limitation, it is agreed that Declarant's approval shall not be considered unreasonably withheld if (i) the proposed assignee is not a recognized conservation organization willing and able to take on the obligations of the "Grantee" under this Declaration, (ii) the assignment does not include a transfer to the assignee, at Grantee's expense, of the Endowment and all then unexpended Funding, (iii) the proposed assignee refuses to execute a "non-opposition" letter agreement in favor of Declarant substantially similar to the "non-opposition" letter agreement executed by Grantee in favor of Declarant substantially concurrently with this Declaration, or (iv) the USFWS fails to approve the assignment. Any assignment in violation of this Section shall, at Declarant's option, be voidable by Declarant. If Grantee desires to effect an assignment, it shall first notify Declarant of its desire and shall submit in writing to Declarant the name and address of the proposed assignee, financial statements for the proposed assignee (or, in the case of a change of ownership or control, for the proposed new controlling entity(ies)), evidence that the proposed assignee will comply with the requirements of subclause (iii) above, a copy of the proposed assignment documentation, and such other information as Declarant may reasonably request. Within 20 business days after receipt of the required information and documentation, Declarant shall, by written notice to Grantee, either: (a) approve the assignment by execution of an approval agreement in a form reasonably designated by Declarant; or (b) refuse to approve the assignment, in which case Declarant shall advise Grantee of the reasonable grounds for such refusal. If Declarant fails to timely respond to Grantee within such 20 business day period, then Grantee may deliver a second notice requesting Declarant's response to its approval request and stating in bold 14-point text that Declarant's failure to respond shall be deemed an approval. If Declarant thereafter fails to respond to such second notice within 10 business days, Declarant's approval shall be deemed granted. If Grantee or any proposed assignee claims that Declarant has unreasonably withheld its approval under this Section, their sole remedies shall be a declaratory judgment and an injunction for the relief sought without any monetary damages, and Grantee hereby waives all other remedies on its own behalf and, to the extent permitted under applicable law, on behalf of the proposed assignee. For purposes of this paragraph, an assignment shall not include a transfer to any entity which controls, is controlled by or is under common control with Grantee. For purposes hereof, "control" shall mean possession of the voting power to direct the management and policies of the applicable entity. Except as provided above, the transfer, assignment, or hypothecation, whether in one transaction or a series of transactions, of a controlling interest of any stock or interest in Grantee shall be deemed an "assignment" within the meaning and provisions of this Section.

ARTICLE III

FUNDING FOR MAINTENANCE, MANAGEMENT AND

MONITORING OF THE LAND IN PERPETUITY

3.1 Endowment; Funding. Concurrently with the recordation of this Declaration, Declarant is providing to Grantee an endowment (the "Endowment"), to be used by Grantee for the maintenance, management and monitoring of the Land to maintain the habitat and species conservation value of the Land, consistent with the terms of the HCP and the Implementing Agreement, and for no purposes that involve other property or that pertain to other purposes not directly related to the Land and the Conservation Purpose. The Endowment consists of a United States Treasury bond, with a maturity date of February 2026 and yielding interest payments after the date hereof of $5,250 on February 15 and August 15 of each year ("Treasury Bond"). Grantee shall treat the principal associated with the United States Treasury Bond as a non-wasting portion of the Endowment, and shall use either the: (i) interest payments from the Treasury Bond, or (ii) if, in coordination with the USFWS, Grantee elects to sell the Treasury Bond, the interest payments on the re-investment of the Treasury Bond proceeds (the "Funding") for purposes of fulfilling its obligations hereunder.

3.2 Initial and Capital Costs. Concurrently with the recordation of this Declaration, Declarant shall also deliver to Grantee, in immediately available funds, the sum of $157,787.67 (the "Initial and Capital Costs"), which Initial and Capital Costs shall be used by Grantee for the administrative cost of accepting the Property, and to pay certain management costs for the first few years following the recordation of this Declaration.

3.3 Mitigation Credit Funding. Declarant shall provide up to a maximum of $14,681.07, but only in the event of Declarant's sale of the mitigation credits specifically identified and recognized by USFWS in Paragraph 10 of the Implementing Agreement and at a time consistent with this Section 3.3. Each time Declarant sells one (1) acre of such mitigation credits, Declarant shall provide Grantee with an amount equal to one-fifth (1/5) of the $14,681.07 (or $2,936.21) until all of the mitigation credits are sold, but in no event shall total payment to Grantee under this Section 3.3 exceed $14,681.07. Declarant shall have no further obligation under this Section 3.3 after providing Grantee with payments under this Section totaling $14,681.07.

ARTICLE IV

ENFORCEMENT OF RESTRICTIONS

4.1 General Purpose and Constructive Notice. The Restrictions shall run and pass with each and every portion of the Land and be binding upon Grantee and its successors and assigns, are established in accordance with Section 1468 of the California Civil Code, and shall benefit the

Benefitted Property and be enforceable by Declarant and/or USFWS notwithstanding any transfers of the Benefitted Property or any portion thereof by Declarant. Except as specifically set forth herein, the Restrictions shall remain in full force and effect in perpetuity, notwithstanding Declarant's exercise of any right or remedy herein due to a previous or repeated violation of any one or more of the Restrictions (and in that regard, if this Declaration is deemed to have expired by operation of law, either Declarant or the USFWS shall have the right to reinstate this Declaration, to the extent such reinstatement is not in violation of any law). Every person or entity who now or hereafter owns or acquires any right, title or interest in or to any portion of the Land is and shall be conclusively deemed to have consented and agreed to the Restrictions and each provision, covenant, condition, right and limitation contained herein, whether or not any reference to this Declaration is contained in the instrument by which such person or entity acquired an interest in the Land.

4.2 Inspection. After notice to Grantee, Declarant or its authorized representatives or USFWS may from time to time, at any reasonable hours, enter upon and inspect the Land or any portion thereof to ascertain compliance with the Restrictions (but without obligation to do so or liability therefor) and/or for any of the purposes set forth in Section 5.1 below. Declarant agrees to indemnify, defend and hold harmless Grantee from any and all losses, damages, costs, liabilities and expenses, including, without limitation, attorneys' fees, disbursements and court costs incurred by Grantee, arising out of the negligent acts or omissions of Declarant or its representatives during any of their entries on the Land after the execution of this Declaration, except to the extent that any such losses, damages, costs, liabilities and expense are the result of the negligent acts or omissions of Grantee or its agents, representatives, employees, contractors or subcontractors. As a condition precedent to Declarant's entry provided hereunder, Declarant shall cause to be maintained (or shall cause each of Declarant's representatives who makes entry on the Land to maintain) commercial general liability insurance covering each such entry, which insurance may be obtained by Declarant or the representative making such entry. Such insurance shall provide coverage in an amount not less than One Million Dollars ($1,000,000) for injury or death of any number of persons in any one accident or occurrence, shall name Grantee as an additional insured, and shall be issued by an insurance company with a "Best's" rating of B+/VII or the equivalent. At Grantee's request, Declarant shall prior to such entry deliver to Grantee certificates of insurance in such form as Grantee may reasonably require, showing compliance with the aforesaid insurance requirements.

4.3 Default and General Remedies. In the event of any breach, violation or failure to perform or satisfy any of the Restrictions which has not been cured within the applicable cure period set forth below, Declarant at its sole option and discretion may enforce any one or more of the following remedies or any other rights or remedies to which Declarant may be entitled by law or equity, whether or not set forth herein. Unless a cure period is otherwise specifically designated, such cure period shall commence when written notice is given to Grantee of a violation hereunder and shall end thirty (30) business days thereafter; provided that if a default is not reasonably susceptible of cure within such 30 day period, then Grantee shall have a reasonable time to cure same so long as Grantee has commenced such cure promptly within the 30 day period and thereafter diligently prosecutes the cure to completion. To the maximum extent allowable by law, all remedies provided herein or by law or equity shall be cumulative and not exclusive.

(a) Damages. Declarant may bring a suit for damages for any compensable breach of or noncompliance with any of the Restrictions, or declaratory relief to determine the enforceability of any of the Restrictions; provided, however, Declarant shall not seek to satisfy any damage judgment it may obtain against Grantee against the corpus of the Endowment.

(b) Equity. It is recognized that a particular or ongoing violation by Grantee of one or more of the foregoing Restrictions may cause Declarant to suffer material injury or damage not compensable in money (including, but not limited to irreparable damage to the conservation values and irreparable effects on the type and quality of development on the Benefited Property or portions thereof), and that Declarant shall be entitled to bring an action in equity or otherwise for specific performance to enforce compliance with the Restrictions or an injunction to enjoin the continuance of any such breach or violation thereof, whether or not Declarant exercises any other remedy set forth herein.

(c) Abatement. Any such breach or violation of these Restrictions or any provision hereof if not timely cured as provided above is hereby declared to be a nuisance, and Declarant shall be entitled to enter the Land and summarily abate and remove, without further legal process to the maximum extent permitted by law, any structure, thing or condition that may exist in violation of any of these Restrictions, or to prosecute any remedy allowed by law or equity for the abatement of such nuisance against any person or entity acting or failing to act in violation of these Restrictions, all at the sole cost and expense of Grantee or any person having possession under Grantee. Any costs or expenses paid or incurred by Declarant in abating such nuisance or prosecuting any such remedy (including all reasonable attorneys' fees and costs of collection) and all other sums owing to Declarant hereunder, together with interest thereon at the maximum rate permitted by law then in effect, shall be a charge against the Land, shall be a continuing lien thereon until paid, and shall also be the personal obligation of Grantee or other person who was owner of the Land when such charges became due and who committed such breach or violation.

4.4 Enforcement by USFWS. USFWS is a third party beneficiary of this Declaration and shall have the same rights as Declarant to enforce the terms of this Declaration as enumerated in Section 4.3 in accordance with the provisions of this Section 4.4. Any action taken by USFWS shall be solely on behalf of USFWS and not Declarant. In the event of any breach, violation or failure to perform or satisfy any of the Restrictions which has not been cured within the applicable cure period USFWS shall send written notice to Declarant indicating its intent to enforce the Restrictions. Such notice shall be delivered to Declarant prior to USFWS taking any action to enforce the Restrictions. USFWS shall provide periodic reports to Declarant during the enforcement action to keep Declarant fully apprised of the status of such action. In addition, Declarant may join any litigation action commenced by USFWS to enforce the Restrictions.

ARTICLE V

RESERVED RIGHTS; MISCELLANEOUS PROVISIONS

5.1 Reserved Rights of Declarant; Mitigation Credits. Declarant hereby reserves the following rights, including, but subject to the terms of Section 4.2 above, the right, after reasonable prior notice, to enter the Land for such purposes (but Declarant shall in no event be required to perform any such activities):

(i) to observe, study and make scientific evaluations of all parts of the Land ecosystem;

(ii) to conduct habitat enhancement and/or restoration and/or creation and/or species protection, recovery and/or enhancement measures as provided in the Implementing Agreement, provided that such measures do not materially interfere with the conservation values of the Land, subject to the reasonable approval of Grantee and subject to compliance with all applicable laws and regulations; and/or

(iii) to preserve and protect the conservation values of the Land.

Without limitation on the foregoing, Declarant also reserves and retains: (a) all interest in the mitigation credits received and recognized by USFWS in Paragraph 10 of the Implementing Agreement; and (b) at Declarant's sole cost and effort, the right to elect to seek additional "mitigation credits" consistent with Paragraph 9.1(d) of the Implementing Agreement for or with respect to the conservation values of the Land or the enhancement, restoration, creation and/or protection measures described above.

5.2 Waiver. No waiver by Declarant of a breach of any of the Restrictions by Grantee and no delay or failure to enforce any of the Restrictions shall be construed or held to be a waiver of any succeeding or preceding breach of the same or any other of the Restrictions. No waiver of any breach or default of Grantee hereunder shall be implied from any omission by Declarant to take any action on account of such breach or default if such breach or default persists or is repeated, and no express waiver shall affect a breach or default other than as specified in said waiver. The consent or approval by Declarant to or of any act by Grantee requiring Declarant's consent or approval shall not be deemed to waive or render unnecessary Declarant's consent or approval to or of any subsequent similar acts by Grantee.

5.3 Costs of Enforcement. In the event any legal or equitable action or proceeding shall be instituted between Declarant and Grantee to enforce any provision of this Declaration, the party prevailing in such action shall be entitled to recover from the losing party all of its costs, including court costs and reasonable attorneys' fees.

5.4 Assignment by Declarant. Any and all of the rights, powers, duties and reservations of Declarant herein contained may be assigned, on an exclusive or non-exclusive basis, to any person(s) or entity(ies) which will assume the duties of Declarant pertaining to the particular rights, powers and reservations assigned, and upon any such person(s) or entity(ies) evidencing its consent in writing to accept such assignment and assume such duties, he or it shall, to the extent of such assignment, have the same rights and powers and be subject to the same obligations and duties as are given to and assumed by Declarant herein. Upon an exclusive assignment, the assigning Declarant shall have no further obligations under this Declaration relating to the particular rights, powers and reservations assigned.

5.5 Termination or Amendment. The Restrictions may be validly terminated, amended, modified or extended, in whole or in part, only by recordation by the San Bernardino County Recorder of a proper instrument duly executed and acknowledged by Declarant, USFWS and Grantee to that effect.

5.6 Captions. The captions used herein are for convenience only and are not a part of this Declaration and do not in any way limit or amplify the scope or intent of the terms and provisions hereof.

5.7 Invalidity of Provision. If any provision of this Declaration as applied to Declarant or Grantee or to any circumstance shall be adjudged by a court of competent jurisdiction to be void, invalid, illegal or unenforceable for any reason, the same shall in no way affect (to the maximum extent permissible by law) any other provision of this Declaration, the application of any such provision under circumstances different from those adjudicated by the court, or the validity or enforceability of the Declaration as a whole.

5.8 Application to Declarant. Notwithstanding anything herein contained to the contrary, if Declarant reacquires title to the Land or any portion thereof at any time after the date hereof, the Restrictions shall remain in full force and effect as to Declarant and such reacquired property, and any subsequent successor to Declarant.

5.9 Time of Essence. Time is of the essence of each provision of this Declaration in which time is an element.

5.10 Other Restrictions. This Declaration is not the exclusive source of restrictions on the use of the Land, and nothing herein contained shall prejudice or diminish in any way Declarant's rights under any other documents of record from time to time affecting all or any portion of the Land.

5.11 Notices. All notices, consents, requests, demands and other communications provided for herein shall be in writing and shall be deemed to have been duly given if and when personally served or seventy-two (72) hours after being sent by United States registered mail, return receipt requested, postage prepaid, to the other party at the following respective addresses:

If to GRANTEE at:

Riverside Land Conservancy
4075 Mission Inn Avenue
Riverside, CA 92501
Phone: (951) 788-0670
Fax: (951) 788-0679
Attn: Gail Egenes, Executive Director

With a copy to:

Gresham Savage Nolan & Tilden
550 East Hospitality Lane, Suite 300
San Bernardino, CA 92408-4205
Phone: (909) 890-4499
Fax: (909) 890-9877
Attn: Matt Wilcox

If to DECLARANT at:

c/o Angelus Block Co., Inc.
11374 Tuxford Street
Sun Valley, CA 91352
Phone: (818) 767-8576
Fax: (818) 768-0473
Attn: Marla Richmond

With a copy to:

O'Neil, LLP
19900 MacArthur Blvd, Suite 1050
Irvine, CA 92612
Phone: (949) 798-0500
Fax: (949) 798-0511
Attn: Andrew K. Hartzell

USFWS:

Carlsbad Fish and Wildlife Office
2177 Salk Avenue, Suite 250
Carlsbad, CA 92008

or at such other address as Declarant, Grantee or USFWS may designate to the other in writing.

IN WITNESS WHEREOF, the undersigned have executed this Declaration as of the date first above written.

DECLARANT:

THE EDWARD ANTONINI RESIDUARY TRUST

By: ______________________________
Name: ______________________________
Title: ______________________________

ACCEPTED AND AGREED TO:

GRANTEE:

RIVERSIDE LAND CONSERVANCY, a California non-profit public benefit corporation

By: ______________________________
Name: ______________________________
Title: ______________________________

STATE OF CALIFORNIA)
) ss
COUNTY OF ORANGE)

On ____________________, before me, ____________________________, a Notary Public, personally appeared ________________________________, who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument, and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Notary Public	

STATE OF CALIFORNIA)
) ss
COUNTY OF ORANGE)

On ____________________, before me, ____________________________, a Notary Public, personally appeared ________________________________, who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument, and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Notary Public	

EXHIBIT A TO SLUR

THE LAND

Parcel 1 as described in and shown on that certain Certificate of Compliance No. 99-19, recorded in the Official Records of the County of San Bernardino, as Document No. 19990502160, recorded December 7, 1999, and depicted on Exhibit A-1 hereto.

EXHIBIT A-1 TO SLUR

DEPICTION OF LAND

[to be added]

EXHIBIT B TO SLUR

THE BENEFITTED PROPERTY

In the City of Rialto, County of San Bernardino, State of California, a portion of Parcel Map 13069, as per map recorded in Parcel Map Book 185, Pages 44-47, in the Office of the County Recorder of said county, specifically being Lots 2 through 15, a portion of Lot 1, and Fortuna Way and Singleton Drive.

The Benefitted Property is shown on Exhibit B to that Certificate of Compliance No. 99-19, recorded in the Official Records of the County of San Bernardino as Document No. 19990502160, recorded December 7, 1999, as Parcel 2 and Lots 2 through 15, including Fortuna Way and Singleton Drive. The Benefitted Property is also depicted as the "Developable Permit Area" in Exhibit 7 of the HCP, and is roughly 65 acres in size.

DEPARTMENT OF THE INTERIOR
U.S. FISH AND WILDLIFE SERVICE

3-201
(1/97)

FEDERAL FISH AND WILDLIFE PERMIT

1. PERMITTEE

ANTONINI TRUST
11374 TUXFORD STREET
SUN VALLEY, LOS ANGELES COUNTY, CA 91352

2. AUTHORITY-STATUTES
16 USC 1539(A)

REGULATIONS *(Attached)*
50 CFR 17.22
50 CFR 13

3. NUMBER
TE015986-0

4. RENEWABLE
[X] YES
[ ] NO

5. MAY COPY
[X] YES
[ ] NO

6. EFFECTIVE
8/27/99

7. EXPIRES
8/27/2029

8. NAME AND TITLE OF PRINCIPAL OFFICER *(If #1 is a business)*
MARIO E. ANTONINI
TRUSTEE

9. TYPE OF PERMIT
ENDANGERED SPECIES

10. LOCATION WHERE AUTHORIZED ACTIVITY MAY BE CONDUCTED
City of Rialto, County of San Bernardino, California, on lands described in the Habitt Conservation Plan prepared for the Edward Antonini Residuary Trust, Angelus Block company, Inc., and E-Z Mix, Inc.

11. CONDITIONS AND AUTHORIZATIONS:

A. GENERAL CONDITIONS SET OUT IN SUBPART D OF 50 CFR 13, AND SPECIFIC CONDITIONS CONTAINED IN FEDERAL REGULATIONS CITED IN BLOCK #2 ABOVE, ARE HEREBY MADE A PART OF THIS PERMIT. ALL ACTIVITIES AUTHORIZED HEREIN MUST BE CARRIED OUT IN ACCORD WITH AND FOR THE PURPOSES DESCRIBED IN THE APPLICATION SUBMITTED. CONTINUED VALIDITY, OR RENEWAL, OF THIS PERMIT IS SUBJECT TO COMPLETE AND TIMELY COMPLIANCE WITH ALL APPLICABLE CONDITIONS, INCLUDING THE FILING OF ALL REQUIRED INFORMATION AND REPORTS.

B. THE VALIDITY OF THIS PERMIT IS ALSO CONDITIONED UPON STRICT OBSERVANCE OF ALL APPLICABLE FOREIGN, STATE, LOCAL OR OTHER FEDERAL LAW.

C. VALID FOR USE BY PERMITTEE NAMED ABOVE.

D. Further conditions of authorization are contained in the attached Special Terms and Conditions.

[X] ADDITIONAL CONDITIONS AND AUTHORIZATIONS ALSO APPLY

12. REPORTING REQUIREMENTS

ISSUED BY
Elizabeth H. Stevens

TITLE
Elizabeth H. Stevens
DEPUTY MANAGER, CA/NV OPERATIONS OFFICE

DATE
8/27/99

E. All sections of Title 50 *Code of Federal Regulations*, §§ 13, 17.22, and 17.32 are conditions of this permit (Attachment 1).

F. The authorization granted by this permit is subject to compliance with, and implementation of, the final Habitat Conservation Plan (HCP), and the executed Implementation Agreement (IA), for Angelus Block Company, Inc., E-Z Mix, Inc., and the Edward Antonini Residuary Trust, in connection with development of approximately 65 acres in the City of Rialto, San Bernardino County, California. The HCP and IA are hereby incorporated into the permit.

G. Except as conditioned below, the permittees and their designated agents are authorized under the Federal Endangered Species Act of 1973, as amended (Act), to incidentally take (harass; or harm through habitat loss, including injury or kill) the Delhi Sands flower-loving fly (*Rhaphiomidas terminatus abdominalis*), listed as endangered under the Act, to the extent that take of this species would otherwise be prohibited under section 9 of the Act and its implementing regulations, or pursuant to a rule promulgated under section 4(d) of the Act. Take must be incidental to the construction and operation of the Industrial Project on the 65-acre Development Area, and management of the approximately 30.5 acre Conservation Area, as described in the HCP, and as conditioned herein. Pesticide and herbicide use is not covered by this permit.

Conditions

(i) This permit is not effective until authorized individuals from Angelus Block Company, Inc., E-Z Mix, Inc., and the Edward Antonini Residuary Trust have signed the IA.

(ii) Prior to any ground disturbance on lots 1-3, Antonini Trust shall provide evidence to the Service of recordation of deed restrictions for the Conservation Area.

(iii) Prior to any ground disturbance on lot 1-3, Antonini Trust shall provide the Service with proof of the purchase of the United States Treasury Bond. Antonini Trust shall transfer the Endowment to a Conservation Organization, pursuant to the terms of the IA. Permittees agree that the Endowment may need to be replaced by an alternative funding mechanism, the cost of which shall not exceed $195,251, if necessary to select an acceptable Conservation Organization.

(iv) The Conservation Bank Credits will be available for purchase after the permittees have completed the initial trash and weed removal throughout the Conservation Area (required within 6 months of permit issuance), where appropriate, in coordination with the Service.

(v) Prior to the commencement of construction activities, the Applicants shall notify the Service that fencing and signing, and the education program have been successfully implemented.

H. Upon finding dead, injured, or sick endangered or threatened wildlife species, the permittees or their designated agents must notify orally within 1 working day the Service's Carlsbad Fish and Wildlife Office, 2730 Loker Avenue West, Carlsbad, California 92008, telephone (760) 431-9440. Written notification to the Carlsbad Fish and Wildlife Office must be made within 3 working days and must include the date, time, and location of the specimen and any other pertinent information. Dead animals may be marked in an appropriate manner, photographed, and left on site. Should any sick or injured animals survive, the Service should be contacted regarding final disposition of the animals. In the event that a species has been taken in contravention of any Federal, State, or local law, all relevant information shall be reported within 24 hours to the Carlsbad Fish and Wildlife Office or to the Service's Division of Law Enforcement in San Diego, (619) 557-5063.

I. Annual reports shall be prepared as described in the HCP, due by December 31 of each year, beginning in 2000 and continuing until at least 2004. At the end of the 5th year, the conservation organization shall submit a status report to the Service. If the performance criteria have not been met as established in the enhancement/restoration plan prepared by the land manager for the Conservation Area and approved by the Service's Carlsbad Fish and Wildlife Office, maintenance or re-seeding shall be prescribed and monitoring will be extended until performance criteria are met. Upon completion of the 5-year maintenance and monitoring period, the conservation organization shall implement a long-term maintenance program that will include its own reporting schedule.

One copy of the annual report, and any subsequent reporting, shall be submitted to the Field Supervisor of the Carlsbad Fish and Wildlife Office, and one copy shall be submitted to the Assistant Regional Director, Ecological Services, Fish and Wildlife Service, 911 N.E. 11th Avenue, Portland, Oregon 97232.

J. A copy of this permit must be in the possession of the permittees and designated agents while conducting taking activities. Please refer to the permit number in all correspondence concerning permit activities. Any questions you may have about this permit should be directed to the Field Supervisor, Carlsbad Fish and Wildlife Office.

Attachment

[39 FR 1161, Jan. 4, 1974, as amended at 42 FR 10465, Feb. 22, 1977; 42 FR 32377, June 24, 1977; 44 FR 54006, Sept. 17, 1979; 44 FR 59083, Oct. 12, 1979; 45 FR 56673, Aug. 25, 1980; 45 FR 78154, Nov. 25, 1980; 46 FR 42680, Aug. 24, 1981; 48 FR 31607, July 8, 1983; 48 FR 57300, Dec. 29, 1983; 50 FR 39687, Sept. 30, 1985; 50 FR 45408, Oct. 31, 1985; 54 FR 38147, Sept. 14, 1989]

Subpart C—Permit Administration

§ 13.21 Issuance of permits.

(a) No permit may be issued prior to the receipt of a written application therefor, unless a written variation from the requirements, as authorized by § 13.4, is inserted into the official file of the Bureau. An oral or written representation of an employee or agent of the United States Government, or an action of such employee or agent, shall not be construed as a permit unless it meets the requirements of a permit as defined in 50 CFR 10.12.

(b) Upon receipt of a properly executed application for a permit, the Director shall issue the appropriate permit unless:

(1) The applicant has been assessed a civil penalty or convicted of any criminal provision of any statute or regulation relating to the activity for which the application is filed, if such assessment or conviction evidences a lack of responsibility.

(2) The applicant has failed to disclose material information required, or has made false statements as to any material fact, in connection with his application;

(3) The applicant has failed to demonstrate a valid justification for the permit and a showing of responsibility;

(4) The authorization requested potentially threatens a wildlife or plant population, or

(5) The Director finds through further inquiry or investigation, or otherwise, that the applicant is not qualified.

(c) *Disqualifying factors.* Any one of the following will disqualify a person from receiving permits issued under this part.

(1) A conviction, or entry of a plea of guilty or nolo contendere, for a felony violation of the Lacey Act, the Migratory Bird Treaty Act, or the Bald and Golden Eagle Protection Act disqualifies any such person from receiving or exercising the privileges of a permit, unless such disqualification has been expressly waived by the Director in response to a written petition.

(2) The revocation of a permit for reasons found in § 13.28 (a)(1) or (a)(2) disqualifies any such person from receiving or exercising the privileges of a similar permit for a period of five years from the date of the final agency decision on such revocation.

(3) The failure to pay any required fees or assessed costs and penalties, whether or not reduced to judgement disqualifies such person from receiving or exercising the privileges of a permit as long as such moneys are owed to the United States. This requirement shall not apply to any civil penalty presently subject to administrative or judicial appeal; provided that the pendency of a collection action brought by the United States or its assignees shall not constitute an appeal within the meaning of this subsection.

(4) The failure to submit timely, accurate, or valid reports as required may disqualify such person from receiving or exercising the privileges of a permit as long as the deficiency exists.

(d) *Use of supplemental information.* The issuing officer, in making a determination under this subsection, may use any information available that is relevant to the issue. This may include any prior conviction, or entry of a plea of guilty or nolo contendere, or assessment of civil or criminal penalty for a violation of any Federal or State law or regulation governing the permitted activity. It may also include any prior permit revocations or suspensions, or any reports of State or local officials. The issuing officer shall consider all relevant facts or information available, and may make independent inquiry or investigation to verify information or substantiate qualifications asserted by the applicant.

(e) *Conditions of issuance and acceptance.* (1) Any permit automatically incorporates within its terms the conditions and requirements of subpart D of this part and of any part(s) or section(s) specifically authorizing or governing the activity for which the permit is issued.

(2) Any person accepting and holding a permit under this subchapter B acknowledges the necessity for close regulation and monitoring of the permitted activity by the Government. By accepting such permit, the permittee consents to and shall allow entry by agents or employees of the Service upon premises where the permitted activity is conducted at any reasonable hour. Service agents or employees may enter such premises to inspect the location; any books, records, or permits required to be kept by this subchapter B; and any wildlife or plants kept under authority of the permit.

(f) *Term of permit.* Unless otherwise modified, a permit is valid during the period specified on the face of the permit. Such period shall include the effective date and the date of expiration.

(g) *Denial.* The issuing officer may deny a permit to any applicant who fails to meet the issuance criteria set forth in this section or in the part(s) or section(s) specifically governing the activity for which the permit is requested.

[39 FR 1161, Jan. 4, 1974, as amended at 42 FR 32377, June 24, 1977; 47 FR 30785, July 15, 1982; 54 FR 38148, Sept. 14, 1989]

§ 13.22 Renewal of permits.

(a) *Application for renewal.* Applicants for renewal of a permit must submit a written application at least 30 days prior to the expiration date of the permit. Applicants must certify in the form required by § 13.12(a)(5) that all statements and information in the original application remain current and correct, unless previously changed or corrected. If such information is no longer current or correct, the applicant must provide corrected information.

(b) *Renewal criteria.* The Service shall issue a renewal of a permit if the applicant meets the criteria for issuance in § 13.21(b) and is not disqualified under § 13.21(c).

(c) *Continuation of permitted activity.* Any person holding a valid, renewable permit, who has complied with this section, may continue the activities authorized by the expired permit until the Service has acted on such person's application for renewal.

(d) *Denial.* The issuing officer may deny renewal of a permit to any applicant who fails to meet the issuance criteria set forth in § 13.21 of this part, or in the part(s) or section(s) specifically governing the activity for which the renewal is requested.

[54 FR 38148, Sept. 14, 1989]

§ 13.23 Amendment of permits.

(a) *Permittee's request.* Where circumstances have changed so that a permittee desires to have any condition of his permit modified, such permittee must submit a full written justification and supporting information in conformity with this part and the part under which the permit was issued.

(b) *Service reservation.* The Service reserves the right to amend any permit for just cause at any time during its term, upon written finding of necessity.

(c) *Change of name or address.* A permittee is not required to obtain a new permit if there is a change in the legal individual or business name, or in the mailing address of the permittee. A permittee is required to notify the issuing office within 10 calendar days of such change. This provision does not authorize any change in location of the conduct of the permitted activity when approval of the location is a qualifying condition of the permit.

[54 FR 38148, Sept. 14, 1989]

§ 13.24 Right of succession by certain persons.

(a) Certain persons, other than the permittee are granted the right to carry on a permitted activity for the remainder of the term of a current permit provided they comply with the provisions of paragraph (b) of this section. Such persons are the following:

(1) The surviving spouse, child, executor, administrator, or other legal representative of a deceased permittee; and

(2) A receiver or trustee in bankruptcy or a court designated assignee for the benefit of creditors.

(b) In order to secure the right provided in this section the person or persons desiring to continue the activity shall furnish the permit to the issuing officer for endorsement within 90 days

from the date the successor begins to carry on the activity.

[54 FR 38149, Sept. 14, 1989]

§ 13.25 Permits not transferable; agents.

(a) Permits issued under this part are not transferable or assignable. Some permits authorize certain activities in connection with a business or commercial enterprise and in the event of any lease, sale, or transfer of such business entity, the successor must obtain a permit prior to continuing the permitted activity. However, certain limited rights of succession are provided in § 13.24.

(b) Except as otherwise stated on the face of the permit, any person who is under the direct control of the permittee, or who is employed by or under contract to the permittee for purposes authorized by the permit, may carry out the activity authorized by the permit, as an agent for the permittee.

[54 FR 38149, Sept. 14, 1989]

§ 13.26 Discontinuance of permit activity.

When a permittee, or any successor to a permittee as provided for by § 13.24, discontinues activities authorized by a permit, the permittee shall within 30 calendar days of the discontinuance return the permit to the issuing office together with a written statement surrendering the permit for cancellation. The permit shall be deemed void and cancelled upon its receipt by the issuing office. No refund of any fees paid for issuance of the permit or for any other fees or costs associated with a permitted activity shall be made when a permit is surrendered for cancellation for any reason prior to the expiration date stated on the face of the permit.

[54 FR 38149, Sept. 14, 1989]

§ 13.27 Permit suspension.

(a) *Criteria for suspension.* The privileges of exercising some or all of the permit authority may be suspended at any time if the permittee is not in compliance with the conditions of the permit, or with any applicable laws or regulations governing the conduct of the permitted activity. The issuing officer may also suspend all or part of the privileges authorized by a permit if the permittee fails to pay any fees, penalties or costs owed to the Government. Such suspension shall remain in effect until the issuing officer determines that the permittee has corrected the deficiencies.

(b) *Procedure for suspension.* (1) When the issuing officer believes there are valid grounds for suspending a permit the permittee shall be notified in writing of the proposed suspension by certified or registered mail. This notice shall identify the permit to be suspended, the reason(s) for such suspension, the actions necessary to correct the deficiencies, and inform the permittee of the right to object to the proposed suspension. The issuing officer may amend any notice of suspension at any time.

(2) Upon receipt of a notice of proposed suspension the permittee may file a written objection to the proposed action. Such objection must be in writing, must be filed within 45 calendar days of the date of the notice of proposal, must state the reasons why the permittee objects to the proposed suspension, and may include supporting documentation.

(3) A decision on the suspension shall be made within 45 days after the end of the objection period. The issuing officer shall notify the permittee in writing of the Service's decision and the reasons therefore. The issuing officer shall also provide the applicant with the information concerning the right to request reconsideration of the decision under § 13.29 of this part and the procedures for requesting reconsideration.

[54 FR 38149, Sept. 14, 1989]

§ 13.28 Permit revocation.

(a) *Criteria for revocation.* A permit may be revoked for any of the following reasons:

(1) The permittee willfully violates any Federal or State statute or regulation, or any Indian tribal law or regulation, or any law or regulation of any foreign country, which involves a violation of the conditions of the permit or of the laws or regulations governing the permitted activity; or

(2) The permittee fails within 60 days to correct deficiencies that were the cause of a permit suspension; or

(3) The permittee becomes disqualified under § 13.21(c) of this part; or

(4) A change occurs in the statute or regulation authorizing the permit that prohibits the continuation of a permit issued by the Service; or

(5) The population(s) of the wildlife or plant that is subject of the permit declines to the extent that continuation of the permitted activity would be detrimental to maintenance or recovery of the affected population.

(b) *Procedure for revocation.* (1) When the issuing officer believes there are valid grounds for revoking a permit, the permittee shall be notified in writing of the proposed revocation by certified or registered mail. This notice shall identify the permit to be revoked, the reason(s) for such revocation, the proposed disposition of the wildlife, if any, and inform the permittee of the right to object to the proposed revocation. The issuing officer may amend any notice of revocation at any time.

(2) Upon receipt of a notice of proposed revocation the permittee may file a written objection to the proposed action. Such objection must be in writing, must be filed within 45 calendar days of the date of the notice of proposal, must state the reasons why the permittee objects to the proposed revocation, and may include supporting documentation.

(3) A decision on the revocation shall be made within 45 days after the end of the objection period. The issuing officer shall notify the permittee in writing of the Service's decision and the reasons therefore, together with the information concerning the right to request and the procedures for requesting reconsideration.

(4) Unless a permittee files a timely request for reconsideration, any wildlife held under authority of a permit that is revoked must be disposed of in accordance with instructions of the issuing officer. If a permittee files a timely request for reconsideration of a proposed revocation, such permittee may retain possession of any wildlife held under authority of the permit until final disposition of the appeal process.

[54 FR 38149, Sept. 14, 1989]

§ 13.29 Review procedures.

(a) *Request for reconsideration.* Any person may request reconsideration of an action under this part if that person is one of the following:

(1) An applicant for a permit who has received written notice of denial;

(2) An applicant for renewal who has received written notice that a renewal is denied;

(3) A permittee who has a permit amended, suspended, or revoked, except for those actions which are required by changes in statutes or regulations, or are emergency changes of limited applicability for which an expiration date is set within 90 days of the permit change; or

(4) A permittee who has a permit issued or renewed but has not been granted authority by the permit to perform all activities requested in the application, except when the activity requested is one for which there is no lawful authority to issue a permit.

(b) *Method of requesting reconsideration.* Any person requesting reconsideration of an action under this part must comply with the following criteria:

(1) Any request for reconsideration must be in writing, signed by the person requesting reconsideration or by the legal representative of that person, and must be submitted to the issuing officer.

(2) The request for reconsideration must be received by the issuing officer within 45 calendar days of the date of notification of the decision for which reconsideration is being requested.

(3) The request for reconsideration shall state the decision for which reconsideration is being requested and shall state the reason(s) for the reconsideration, including presenting any new information or facts pertinent to the issue(s) raised by the request for reconsideration.

(4) The request for reconsideration shall contain a certification in substantially the same form as that provided by § 13.12(a)(5). If a request for reconsideration does not contain such certification, but is otherwise timely

and appropriate, it shall be held and the person submitting the request shall be given written notice of the need to submit the certification within 15 calendar days. Failure to submit certification shall result in the request being rejected as insufficient in form and content.

(c) *Inquiry by the Service.* The Service may institute a separate inquiry into the matter under consideration.

(d) *Determination of grant or denial of a request for reconsideration.* The issuing officer shall notify the permittee of the Service's decision within 45 days of the receipt of the request for reconsideration. This notification shall be in writing, shall state the reasons for the decision, and shall contain a description of the evidence which was relied upon by the issuing officer. The notification shall also provide information concerning the right to appeal, the official to whom an appeal may be addressed, and the procedures for making an appeal.

(e) *Appeal.* A person who has received an adverse decision following submission of a request for reconsideration may submit a written appeal to the Regional Director for the region in which the issuing office is located, or to the Director for offices which report directly to the Director. An appeal must be submitted within 45 days of the date of the notification of the decision on the request for reconsideration. The appeal shall state the reason(s) and issue(s) upon which the appeal is based and may contain any additional evidence or arguments to support the appeal.

(f) *Decision on appeal.* (1) Before a decision is made concerning the appeal the appellant may present oral arguments before the Regional Director or the Director, as appropriate, if such official judges oral arguments are necessary to clarify issues raised in the written record.

(2) The Service shall notify the appellant in writing of its decision within 45 calendar days of receipt of the appeal, unless extended for good cause and the appellant notified of the extension.

(3) The decision of the Regional Director or the Director shall constitute the final administrative decision of the Department of the Interior.

[54 FR 38149, Sept. 14, 1989]

Subpart D—Conditions

§ 13.41 Humane conditions.

Any live wildlife possessed under a permit must be maintained under humane and healthful conditions.

[54 FR 38150, Sept. 14, 1989]

§ 13.42 Permits are specific.

The authorizations on the face of a permit which set forth specific times, dates, places, methods of taking, numbers and kinds of wildlife or plants, location of activity, authorize certain circumscribed transactions, or otherwise permit a specifically limited matter, are to be strictly construed and shall not be interpreted to permit similar or related matters outside the scope of strict construction.

[39 FR 1161, Jan. 4, 1974, as amended at 42 FR 32377, June 24, 1977]

§ 13.43 Alteration of permits.

Permits shall not be altered, erased, or mutilated, and any permit which has been altered, erased, or mutilated shall immediately become invalid. Unless specifically permitted on the face thereof, no permit shall be copied, nor shall any copy of a permit issued pursuant to this subchapter B be displayed, offered for inspection, or otherwise used for any official purpose for which the permit was issued.

§ 13.44 Display of permit.

Any permit issued under this part shall be displayed for inspection upon request to the Director or his agent, or to any other person relying upon its existence.

§ 13.45 Filing of reports.

Permittees may be required to file reports of the activities conducted under the permit. Any such reports shall be filed not later than March 31 for the preceding calendar year ending December 31, or any portion thereof, during which a permit was in force, unless the regulations of this subchapter B or the provisions of the permit set forth other reporting requirements.

§ 13.46 Maintenance of records.

From the date of issuance of the permit, the permittee shall maintain complete and accurate records of any taking, possession, transportation, sale, purchase, barter, exportation, or importation of plants obtained from the wild (excluding seeds) or wildlife pursuant to such permit. Such records shall be kept current and shall include names and addresses of persons with whom any plant obtained from the wild (excluding seeds) or wildlife has been purchased, sold, bartered, or otherwise transferred, and the date of such transaction, and such other information as may be required or appropriate. Such records shall be legibly written or reproducible in English and shall be maintained for five years from the date of expiration of the permit.

[39 FR 1161, Jan. 4, 1974, as amended at 42 FR 32377, June 24, 1977; 54 FR 38150, Sept. 14, 1989]

§ 13.47 Inspection requirement.

Any person holding a permit under this subchapter B shall allow the Director's agent to enter his premises at any reasonable hour to inspect any wildlife or plant held or to inspect, audit, or copy any permits, books, or records required to be kept by regulations of this subchapter B.

[39 FR 1161, Jan. 4, 1974, as amended at 42 FR 32377, June 24, 1977]

§ 13.48 Compliance with conditions of permit.

Any person holding a permit under subchapter B and any person acting under authority of such permit must comply with all conditions of the permit and with all appllicable laws and regulations governing the permitted activity.

[54 FR 38150, Sept. 14, 1989]

§ 13.49 Surrender of permit.

Any person holding a permit under subchapter B shall surrender such permit to the issuing officer upon notification that the permit has been suspended or revoked by the Service, and all appeal procedures have been exhausted.

[54 FR 38150, Sept. 14, 1989]

§ 13.50 Acceptance of liability.

Any person holding a permit under subchapter B assumes all liability and responsibility for the conduct of any activity conducted under the authority of such permit.

[54 FR 38150, Sept. 14, 1989]

PART 14—IMPORTATION, EXPORTATION, AND TRANSPORTATION OF WILDLIFE

Subpart A—Introduction

Subpart B—Importation and Exportation at Designated Ports

Subpart C—Designated Port Exception Permits

Subpart D—[Reserved]

Subpart E—Inspection and Clearance of Wildlife

270—52 FR 21480; June 5, 1987.
271—52 FR 21484; June 5, 1987.
274—52 FR 22589; June 12, 1987.
275—52 FR 22933; June 16, 1987.
276—52 FR 22936; June 16, 1987.
277—52 FR 22939; June 16, 1987.
285—52 FR 32929; September 1, 1987.
286—52 FR 34917; September 16, 1987.
291—52 FR 36270; September 28, 1987.
293—52 FR 37420; October 6, 1987.
295—52 FR 41440; October 28, 1987.
297—52 FR 42071; November 2, 1987.
298—52 FR 42657; November 6, 1987.
300—52 FR 44401; November 19, 1987.
301—52 FR 46087; December 4, 1987.
302—53 FR 3565; February 5, 1988.
303—53 FR 3567; February 5, 1988.
305—53 FR 4629; February 17, 1988.
306—53 FR 10884; April 4, 1988.
307—53 FR 11612; April 7, 1988.
308—53 FR 11615; April 7, 1988.
309—53 FR 23742; June 23, 1988.
310—53 FR 23745; June 23, 1988.
311—53 FR 23748; June 23, 1988.
314—53 FR 27137; July 18, 1988.
315—53 FR 27141; July 18, 1988.
318—53 FR 32827; August 26, 1988.
319—53 FR 32830; August 26, 1988.
321—53 FR 33996; September 1, 1988.
324—53 FR 34701; September 7, 1988.
325—53 FR 34705; September 7, 1988.
326—53 FR 35080; September 9, 1988.
329—53 FR 37972; September 28, 1988.
30—53 FR 37975; September 28, 1988.
31—53 FR 37978; September 28, 1988.
32—53 FR 37982; September 28, 1988.
33—53 FR 38451; September 30, 1988.
35—53 FR 38456; September 30, 1988.
39—53 FR 38474; September 30, 1988.
41—53 FR 45861; November 14, 1988.
43—54 FR 2134; January 19, 1989.
14—54 FR 5938; February 7, 1989.
16—54 FR 10154; March 10, 1989.
17—54 FR 14967; April 14, 1989.
2—54 FR 29658; July 13, 1989.
3—54 FR 29663; July 13, 1989.
4—54 FR 29730; July 14, 1989.
5—54 FR 30554; July 21, 1989.
5—54 FR 31196; July 27, 1989.
—54 FR 35305; August 24, 1989.
—54 FR 38947; September 21, 1989.
—54 FR 38950; September 21, 1989.
—54 FR 39857; September 28, 1989.
—54 FR 39863; September 28, 1989.
—55 FR 433; January 5, 1990.
—55 FR 4157; February 6, 1990.
—55 FR 4159; February 6, 1990.
—55 FR 12790; April 5, 1990.
—55 FR 12793; April 5, 1990.
381—55 FR 12797; April 5, 1990.
385—55 FR 13491; April 10, 1990.
386—55 FR 13911; April 13, 1990.
389—55 FR 24246; June 15, 1990.
392—55 FR 25599; June 21, 1990.
395—55 FR 29370; July 19, 1990.
397—55 FR 32255; August 8, 1990.
398—55 FR 32257; August 8, 1990.
402—55 FR 39864; September 28, 1990.
403—55 FR 39867; September 28, 1990.
406—55 FR 49050; November 26, 1990.
409—55 FR 50187; December 5, 1990.
413—56 FR 1453; January, 14, 1991.
414—56 FR 1457; January, 14, 1991.
418—56 FR 1936; January, 18, 1991.
420—56 FR 16024; April 19, 1991.
422—56 FR 19959; May 1, 1991.
424—56 FR 21091; May 7, 1991.
425—56 FR 21096; May 7, 1991.
429—56 FR 32983; July 18, 1991.
430—56 FR 34154; July 26, 1991.
434—56 FR 46239; September 11, 1991.
435—56 FR 47694; September 20, 1991.
436—56 FR 47699; September 20, 1991.
437—56 FR 48751; September 20, 1991.
438—56 FR 48755; September 20, 1991.
439—56 FR 49636; September 30, 1991.
440—56 FR 49639; September 30, 1991.
441—56 FR 49643; September 30, 1991.
445—56 FR 49853; October 2, 1991.
448—56 FR 55785; October 29, 1991.
450—56 FR 57849; November 14, 1991.
451—56 FR 60937; November 29, 1991.
452—56 FR 60940; November 29, 1991.
453—56 FR 61182; December 2, 1991.
457—57 FR 1403; January 14, 1992.
458—57 FR 2053; January 17, 1992.
460—57 FR 14653; April 22, 1992.
461—57 FR 14785; April 22, 1992.
463—57 FR 19819; May 8, 1992.
464—57 FR 20588; May 13, 1992.
465—57 FR 20592; May 13, 1992.
466—57 FR 20595; May 13, 1992.
467—57 FR 20787; May 15, 1992.
468—57 FR 21564; May 20, 1992.
470—57 FR 21574; May 20, 1992.
471—57 FR 24199; June 8, 1992.
472—57 FR 27858; June 22, 1992.
473—57 FR 27863; June 22, 1992.
474—57 FR 27867; June 22, 1992.
476—57 FR 30168; July 8, 1992.
477—57 FR 44340; September 25, 1992.
478—57 FR 44708; September 29, 1992.
480—57 FR 46339; October 8, 1992.
481—57 FR 46344; October 8, 1992.
482—57 FR 46747; October 28, 1992.
490—58 FR 8242; February 12, 1993.
491—58 FR 11552; February 26, 1993.
497—58 FR 18035; April 7, 1993.

498—58 FR 18041; April 7, 1993.
500—58 FR 25754; April 27, 1993.
501—58 FR 25758; April 27, 1993.
504—58 FR 32311; June 9, 1993.
506—58 FR 35891; July 2, 1993.
507—58 FR 37443; July 12, 1993.
509—58 FR 40547; July 28, 1993.
510—58 FR 40551; July 28, 1993.
511—58 FR 41383; August 3, 1993.
512—58 FR 41391; August 3, 1993.
515—58 FR 49879; September 23, 1993.
519—58 FR 52030; October 6 1993.
521—58 FR 53807; October 10/18/93.
523—58 FR 62050; November 24, 1993.
524—58 FR 68480; December 27, 1993
528—59 FR 5510; February 4 1994.
529—59 FR 8141; February 18 1994.
530—59 FR 9327; February 25, 1994.
531—59 FR 10324; March 2, 1994.
532—59 FR 10324; March 4, 1994.
535—59 FR 13840; March 23, 1994.
536—59 FR 14493; March 28, 1994.
537—59 FR 15345; April 1, 1994.
541—59 FR 32937; June 27, 1994.
542—59 FR 35864; July 14, 1994.
544—59 FR 42176; August 17, 1994.
547—59 FR 43652; August 24, 1994.
548—59 FR 43652; August 24, 1994.
551—59 FR 46718; September 9, 1994.
553—59 FR 49031; September 26, 1994.
555—59 FR 49863; September 30, 1994.
556—59 FR 50857; October 6, 1994.
558—59 FR 56333; November 10, 1994.
559—59 FR 56350; November 10, 1994.
560—59 FR 59177; November 16, 1994.
564—59 FR 60568; November 25, 1994.
565—59 FR 62352; December 5, 1994.
567—59 FR 64623; December 15, 1994.
570—60 FR 61; January 3, 1995.
572—60 FR 3562; January 18, 1995.
575—60 FR 6684; February 3, 1995.
578—60 FR 12846; March 7, 1995.
581—60 FR 10697; March 15, 1996.
584—61 FR 31058; June 19, 1996.
586—61 FR 41023; August 7, 1996.
587—61 FR 43184; August 21, 1996.

[48 FR 34182, July 27, 1983]

EDITORIAL NOTE 1: For FEDERAL REGISTER citations affecting the table in §17.12(h), see the listing above.

EDITORIAL NOTE: For FEDERAL REGISTER citations affecting §17.12, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

Subpart C—Endangered Wildlife

§ 17.21 Prohibitions.

(a) Except as provided in subpart A of this part, or under permits issued pursuant to §17.22 or §17.23, it is unlawful for any person subject to the jurisdiction of the United States to commit, to attempt to commit, to solicit another to commit or to cause to be committed, any of the acts described in paragraphs (b) through (f) of this section in regard to any endangered wildlife.

(b) *Import or export.* It is unlawful to import or to export any endangered wildlife. Any shipment in transit through the United States is an importation and an exportation, whether or not it has entered the country for customs purposes.

(c) *Take.* (1) It is unlawful to take endangered wildlife within the United States, within the territorial sea of the United States, or upon the high seas. The high seas shall be all waters seaward of the territorial sea of the United States, except waters officially recognized by the United States as the territorial sea of another country, under international law.

(2) Notwithstanding paragraph (c)(1) of this section, any person may take endangered wildlife in defense of his own life or the lives of others.

(3) Notwithstanding paragraph (c)(1) of this section, any employee or agent of the Service, any other Federal land management agency, the National Marine Fisheries Service, or a State conservation agency, who is designated by his agency for such purposes, may, when acting in the course of his official duties, take endangered wildlife without a permit if such action is necessary to:

(i) Aid a sick, injured or orphaned specimen; or

(ii) Dispose of a dead specimen; or

(iii) Salvage a dead specimen which may be useful for scientific study; or

(iv) Remove specimens which constitute a demonstrable but nonimmediate threat to human safety, provided that the taking is done in a humane manner; the taking may involve killing or injuring only if it has not been reasonably possible to eliminate such threat by live-capturing and releasing

the specimen unharmed, in a remote area.

(4) Any taking pursuant to paragraphs (c) (2) and (3) of this section must be reported in writing to the U.S. Fish and Wildlife Service, Division of Law Enforcement, P.O. Box 19183, Washington, DC 20036, within 5 days. The specimen may only be retained, disposed of, or salvaged in accordance with directions from Service.

(5) Notwithstanding paragraph (c)(1) of this section, any qualified employee or agent of a State Conservation Agency which is a party to a Cooperative Agreement with the Service in accordance with section 6(c) of the Act, who is designated by his agency for such purposes, may, when acting in the course of his official duties take those endangered species which are covered by an approved cooperative agreement for conservation programs in accordance with the Cooperative Agreement, provided that such taking is not reasonably anticipated to result in:

(i) The death or permanent disabling of the specimen;

(ii) The removal of the specimen from the State where the taking occurred;

(iii) The introduction of the specimen so taken, or of any progeny derived from such a specimen, into an area beyond the historical range of the species; or

(iv) The holding of the specimen in captivity for a period of more than 45 consecutive days.

(d) *Possession and other acts with unlawfully taken wildlife.* (1) It is unlawful to possess, sell, deliver, carry, transport, or ship, by any means whatsoever, any endangered wildlife which was taken in violation of paragraph (c) of this section.

Example. A person captures a whooping crane in Texas and gives it to a second person, who puts it in a closed van and drives thirty miles, to another location in Texas. The second person then gives the whooping crane to a third person, who is apprehended with the bird in his possession. All three have violated the law—the first by illegally taking the whooping crane; the second by transporting an illegally taken whooping crane; and the third by possessing an illegally taken whooping crane.

(2) Notwithstanding paragraph (d)(1) of this section, Federal and State law enforcement officers may possess, deliver, carry, transport or ship any endangered wildlife taken in violation of the Act as necessary in performing their official duties.

(e) *Interstate or foreign commerce.* It is unlawful to deliver, receive, carry, transport, or ship in interstate or foreign commerce, by any means whatsoever, and in the course of a commercial activity, any endangered wildlife.

(f) *Sale or offer for sale.* (1) It is unlawful to sell or to offer for sale in interstate or foreign commerce any endangered wildlife.

(2) An advertisement for the sale of endangered wildlife which carries a warning to the effect that no sale may be consummated until a permit has been obtained from the U.S. Fish and Wildlife Service shall not be considered an offer for sale within the meaning of this section.

(g) *Captive-bred wildlife.* (1) Notwithstanding paragraphs (b), (c), (e) and (f) of this section, any person may take; import or export; deliver, receive, carry, transport or ship in interstate or foreign commerce, in the course of a commercial activity; or sell or offer for sale in interstate or foreign commerce any endangered wildlife that is bred in captivity in the United States, provided the principal purpose of these activities is to facilitate captive breeding, and provided the following conditions are met:

(i) The wildlife is a species having a natural geographic distribution not including any part of the United States, or the wildlife is a species that the Director has determined to be eligible in accordance with paragraph (g)(5) of this section;

(ii) The purpose of such activity is to enhance the propagation or survival of the affected species;

(iii) Such activity does not involve interstate or foreign commerce, in the course of a commercial activity, with respect to non-living wildlife;

(iv) Each specimen of wildlife to be imported is uniquely identified by a band, tattoo or other means that was reported in writing to an official of the Service at a port of export prior to export from the United States, and

(v) Any person subject to the jurisdiction of the United States who engages in any of the activities authorized by this paragraph does so in accordance with paragraphs (g) (2), (3) and (4) of this section.

(2) Any person subject to the jurisdiction of the United States seeking to engage in any of the activities authorized by this paragraph must first register with the Service (Federal Wildlife Permit Office, U.S. Fish and Wildlife Service, Washington, DC 20240). Requests for registration must be submitted on an official application form (Form 3-200) provided by the Service, and must include the following information:

(i) The types of wildlife sought to be covered by the registration, identified by common and scientific name to the taxonomic level of family, genus or species;

(ii) A description of the applicant's experience in maintaining and propagating the types of wildlife sought to be covered by the registration, or in conducting research directly related to maintaining and propagating such wildlife;

(iii) A description, if appropriate, of the means by which the applicant intends to educate the public about the ecological role and conservation needs of the affected species;

(iv) Photograph(s) or other evidence clearly depicting the facilities where such wildlife will be maintained; and

(v) A copy of the applicant's license or registration, if any, under the animal welfare regulations of the U.S. Department of Agriculture (9 CFR part 2).

(3) Upon receiving a complete application, the Director will decide whether or not the registration will be approved. In making his decision, the Director will consider, in addition to the general criteria in §13.2(b) of this subchapter, whether the expertise, facilities or other resources available to the applicant appear adequate to enhance the propagation or survival of the affected wildlife. Each person so registered must maintain accurate written records of activities conducted under the registration and must submit to the Director a written annual report of such activities.

(4) Any person subject to the jurisdiction of the United States seeking to export or conduct foreign commerce in captive-bred endangered wildlife which will not remain under the care of that person must first obtain approval by providing written evidence to satisfy the Director that the proposed recipient of the wildlife has expertise, facilities or other resources adequate to enhance the propagation or survival of such wildlife and that the proposed recipient will use such wildlife for purposes of enhancing the propagation or survival of the affected species.

(5)(i) The Director shall use the following criteria to determine if wildlife of any species having a natural geographic distribution that includes any part of the United States is eligible for the provisions of this paragraph:

(A) Whether there is a low demand for taking of the species from wild populations, either because of the success of captive breeding or because of other reasons, and

(B) Whether the wild populations of the species are effectively protected from unauthorized taking as a result of the inaccessibility of their habitat to man or as a result of the effectiveness of law enforcement.

(ii) The Director shall follow the procedures set forth in section 4(b) and section 4(f)(2)(A) of the Act and in the regulations promulgated thereunder with respect to petitions and notification of the public and governors of affected States when determining the eligibility of species for purposes of this paragraph.

(iii) In accordance with the criteria in paragraph (g)(5)(i) of this section, the Director has determined the following species to be eligible for the provisions of this paragraph:

Laysan teal (*Anas laysanensis*).

[40 FR 44415, Sept. 26, 1975, as amended at 40 FR 53400, Nov. 18, 1975; 41 FR 19226, May 11, 1976; 44 FR 31580, May 31, 1979; 44 FR 54007, Sept. 17, 1979; 58 FR 68325, Dec. 27, 1993]

§ 17.22 Permits for scientific purposes, enhancement of propagation or survival, or for incidental taking.

Upon receipt of a complete application, the Director may issue a permit authorizing any activity otherwise prohibited by §17.21, in accordance with the issuance criteria of this section, for scientific purposes, for enhancing the

propagation or survival, or for the incidental taking of endangered wildlife. Such permits may authorize a single transaction, a series of transactions, or a number of activities over a specific period of time. (See § 17.32 for permits for threatened species.) The Director shall publish notice in the FEDERAL REGISTER of each application for a permit that is made under this section. Each notice shall invite the submission from interested parties, within 30 days after the date of the notice, of written data, views, or arguments with respect to the application. The 30-day period may be waived by the Director in an emergency situation where the life or health of an endangered animal is threatened and no reasonable alternative is available to the applicant. Notice of any such waiver shall be published in the FEDERAL REGISTER within 10 days following issuance of the permit.

(a)(1) *Application requirements for permits for scientific purposes or for the enhancement of propagation or survival.* Applications for permits under this paragraph must be submitted to the Director, U.S. Fish and Wildlife Service, Federal Wildlife Permit Office, 1000 N. Glebe Road, Room 611, Arlington, Virginia 22201, by the person wishing to engage in the activity prohibited by § 17.21. Each application must be submitted on an official application (Form 3–200) provided by the Service and must include as an attachment, all of the following information:

(i) The common and scientific names of the species sought to the covered by the permit, as well as the number, age, and sex of such species, and the activity sought to be authorized (such as taking, exporting, selling in interstate commerce);

(ii) A statement as to whether, at the time of application, the wildlife sought to be covered by the permit (A) is still in the wild, (B) has already been removed from the wild, or (C) was born in captivity;

(iii) A resume of the applicant's attempts to obtain the wildlife sought to be covered by the permit in a manner which would not cause the death or removal from the wild of such wildlife;

(iv) If the wildlife sought to be covered by the permit has already been removed from the wild, the country and place where such removal occurred; if the wildlife sought to be covered by the permit was born in captivity, the country and place where such wildlife was born;

(v) A complete description and address of the institution or other facility where the wildlife sought to be covered by the permit will be used, displayed, or maintained;

(vi) If the applicant seeks to have live wildlife covered by the permit, a complete description, including photographs or diagrams, of the facilities to house and/or care for the wildlife and a resume of the experience of those person who will be caring for the wildlife;

(vii) A full statement of the reasons why the applicant is justified in obtaining a permit including the details of the activities sought to be authorized by the permit;

(viii) If the application is for the purpose of enhancement of propagation, a statement of the applicant's willingness to participate in a cooperative breeding program and to maintain or contribute data to a studbook;

(ix) The information collection requirements contained in this paragraph have been approved by the Office of Management and Budget under 44 U.S.C. 3507 and assigned Clearance Number 1018–0022. This information is being collected to provide information necessary to evaluate permit applications and make decisions, according to criteria established in various Federal wildlife and plant conservation statutes and regulations, on the issuance or denial of permits. The obligation to respond is required to obtain or retain a permit.

(2) *Issuance criteria.* Upon receiving an application completed in accordance with paragraph (a)(1) of this section, the Director will decide whether or not a permit should be issued. In making this decision, the Director shall consider, in addition to the general criteria in § 13.21(b) of this subchapter, the following factors:

(i) Whether the purpose for which the permit is required is adequate to justify removing from the wild or otherwise changing the status of the wildlife sought to be covered by the permit;

(ii) The probable direct and indirect effect which issuing the permit would have on the wild populations of the wildlife sought to be covered by the permit;

(iii) Whether the permit, if issued, would in any way, directly or indirectly, conflict with any known program intended to enhance the survival probabilities of the population from which the wildlife sought to be covered by the permit was or would be removed;

(iv) Whether the purpose for which the permit is required would be likely to reduce the threat of extinction facing the species of wildlife sought to be covered by the permit;

(v) The opinions or views of scientists or other persons or organizations having expertise concerning the wildlife or other matters germane to the application; and

(vi) Whether the expertise, facilities, or other resources available to the applicant appear adequate to successfully accomplish the objectives stated in the application.

(3) *Permit conditions.* In addition to the general conditions set forth in part 13 of this subchapter, every permit issued under this paragraph shall be subject to the special condition that the escape of living wildlife covered by the permit shall be immediately reported to the Service office designated in the permit.

(4) *Duration of permits.* The duration of permits issued under this paragraph shall be designated on the face of the permit.

(b)(1) *Application requirements for permits for incidental taking.* Applications for permits under this paragaph must be submitted to the Director, U.S. Fish and Wildlife Service, Federal Wildlife Permit Office, 1000 N. Glebe Road, Room 611, Arlington, Virginia 22201, by the person wishing to engage in the activity prohibited by § 17.21(c). Each application must be submitted on an official application (Form 3–200) provided by the Service and must include as an attachment all of the following information:

(i) A complete description of the activity sought to be authorized;

(ii) The common and scientific names of the species sought to be covered by the permit, as well as the number, age, and sex of such species, if known;

(iii) A conservation plan that specifies:

(A) The impact that will likely result from such taking;

(B) What steps the applicant will take to monitor, minimize, and mitigate such impacts, the funding that will be available to implement such steps, and the procedures to be used to deal with unforeseen circumstances;

(C) What alternative actions to such taking the applicant considered and the reasons why such alternatives are not proposed to be utilized; and

(D) Such other measures that the Director may require as being necessary or appropriate for purposes of the plan;

(iv) The information collection requirements contained in this paragraph have been approved by the Office of Management and Budget under 44 U.S.C. 3507 and assigned Clearance Number 1018–0022. This information is being collected to provide information necessary to evaluate permit applications. This information will be used to review permit applications and make decisions, according to criteria established in various Federal wildlife and plant conservation statutes and regulations, on the issuance or denial of permits. The obligation to respond is required to obtain or retain a permit.

(2) *Issuance criteria.* Upon receiving an application completed in accordance with paragraph (b)(1) of this section, the Director will decide whether or not a permit should be issued. The Director shall consider the general criteria in § 13.21(b) of this subchapter and shall issue the permit if he finds that: (i) The taking will be incidental; (ii) the applicant will, to the maximum extent practicable, minimize and mitigate the impacts of such taking; (iii) the applicant will ensure that adequate funding for the conservation plan and procedures to deal with unforeseen circumstances will be provided; (iv) the taking will not appreciably reduce the likelihood of the survival and recovery of the species in the wild; (v) the measures, if any, required under paragraph (b)(1)(iii)(D) of this section will be met; and (vi) he has received such other assurances as he may require that the plan will be implemented. In making

his decision, the Director shall also consider the anticipated duration and geographic scope of the applicant's planned activities, including the amount of listed species habitat that is involved and the degree to which listed species and their habitats are affected.

(3) *Permit conditions.* In addition to the general conditions set forth in part 13 of this subchapter, every permit issued under this paragraph shall contain such terms and conditions as the Director deems necessary or appropriate to carry out the purposes of the permit and the conservation plan including, but not limited to, monitoring and reporting requirements deemed necessary for determining whether such terms and conditions are being complied with. The Director shall rely upon existing reporting requirements to the maximum extent practicable.

(4) *Duration of permits.* The duration of permits issued under this paragraph shall be sufficient to provide adequate assurances to the permittee to commit funding necessary for the activities authorized by the permit, including conservation activities and land use restrictions. In determining the duration of a permit, the Director shall consider the duration of the planned activities, as well as the possible positive and negative effects associated with permits of the proposed duration on listed species, including the extent to which the conservation plan will enhance the habitat of listed species and increase the long-term survivability of such species.

(c) *Objection to permit issuance.* (1) In regard to any notice of a permit application published in the FEDERAL REGISTER, any interested party that objects to the issuance of a permit, in whole or in part, may, during the comment period specified in the notice, request notification of the final action to be taken on the application. A separate written request shall be made for each permit application. Such a request shall specify the Service's permit application number and state the reasons why that party believes the applicant does not meet the issuance criteria contained in §§ 13.21 and 17.22 of this subchapter or other reasons why the permit should not be issued.

(2) If the Service decides to issue a permit contrary to objections received pursuant to paragraph (c)(1) of this section, then the Service shall, at least ten days prior to issuance of the permit, make reasonable efforts to contact by telephone or other expedient means, any party who has made a request pursuant to paragraph (c)(1) of this section and inform that party of the issuance of the permit. However, the Service may reduce the time period or dispense with such notice if it determines that time is of the essence and that delay in issuance of the permit would: (i) Harm the specimen or population involved; or (ii) unduly hinder the actions authorized under the permit.

(3) The Service will notify any party filing an objection and request for notice under paragraph (c)(1) of this section of the final action taken on the application, in writing. If the Service has reduced or dispensed with the notice period referred to in paragraph (c)(2) of this section, it will include its reasons therefore in such written notice.

[50 FR 39687, Sept. 30, 1985]

§ 17.23 Economic hardship permits.

Upon receipt of a complete application, the Director may issue a permit authorizing any activity otherwise prohibited by § 17.21, in accordance with the issuance criteria of this section in order to prevent undue economic hardship. The Director shall publish notice in the FEDERAL REGISTER of each application for a permit that is made under this section. Each notice shall invite the submission from interested parties, within 30 days after the date of the notice, of written data, views, or arguments with respect to the application. The 30-day period may be waived by the Director in an emergency situation where the life or health of an endangered animal is threatened and no reasonable alternative is available to the applicant. Notice of any such waiver shall be published in the FEDERAL REGISTER within 10 days following issuance of the permit.

(a) *Application requirements.* Applications for permits under this section must be submitted to the Director by the person allegedly suffering undue economic hardship because his desired activity is prohibited by § 17.21. Each

application must be submitted on an official application form (Form 3–200) provided by the Service, and must include, as an attachment, all of the information required in § 17.22 plus the following additional information:

(1) The possible legal, economic or subsistence alternatives to the activity sought to be authorized by the permit;

(2) A full statement, accompanied by copies of all relevant contracts and correspondence, showing the applicant's involvement with the wildlife sought to be covered by the permit (as well as his involvement with similar wildlife), including, where applicable, that portion of applicant's income derived from the taking of such wildlife, or the subsistence use of such wildlife, during the calendar year immediately preceding either the notice in the FEDERAL REGISTER of review of the status of the species or of the proposal to list such wildlife as endangered, whichever is earliest;

(3) Where applicable, proof of a contract or other binding legal obligation which:

(i) Deals specifically with the wildlife sought to be covered by the permit;

(ii) Became binding prior to the date when the notice of a review of the status of the species or the notice of proposed rulemaking proposing to list such wildlife as endangered was published in the FEDERAL REGISTER, whichever is earlier; and

(iii) Will cause monetary loss of a given dollar amount if the permit sought under this section is not granted.

(b) *Issuance criteria.* Upon receiving an application completed in accordance with paragraph (a) of this section, the Director will decide whether or not a permit should be issued under any of the three categories of economic hardship, as defined in section 10(b)(2) of the Act. In making his decisions, the Director shall consider, in addition to the general criteria in § 13.21(b) of this subchapter, the following factors:

(1) Whether the purpose for which the permit is being requested is adequate to justify removing from the wild or otherwise changing the status of the wildlife sought to be covered by the permit;

(2) The probable direct and indirect effect which issuing the permit would have on the wild populations of the wildlife sought to be covered by the permit;

(3) The economic, legal, subsistence, or other alternatives or relief available to the applicant;

(4) The amount of evidence that the applicant was in fact party to a contract or other binding legal obligation which;

(i) Deals specifically with the wildlife sought to be covered by the permit; and

(ii) Became binding prior to the date when the notice of a review of the status of the species or the notice of proposed rulemaking proposing to list such wildlife as endangered was published in the FEDERAL REGISTER, whichever is earlier.

(5) The severity of economic hardship which the contract or other binding legal obligation referred to in paragraph (b)(4) of this section would cause if the permit were denied;

(6) Where applicable, the portion of the applicant's income which would be lost if the permit were denied, and the relationship of that portion to the balance of his income;

(7) Where applicable, the nature and extent of subsistence taking generally by the applicant; and

(8) The likelihood that applicant can reasonably carry out his desired activity within one year from the date a notice is published in the FEDERAL REGISTER to review status of such wildlife, or to list such wildlife as endangered, whichever is earlier.

(c) *Permit conditions.* In addition to the general conditions set forth in part 13 of this subchapter, every permit issued under this section shall be subject to the following special conditions:

(1) In addition to any reporting requirements contained in the permit itself, the permittee shall also submit to the Director a written report of his activities pursuant to the permit. Such report must be postmarked or actually delivered no later than 10 days after completion of the activity.

(2) The death or escape of all living wildlife covered by the permit shall be immediately reported to the Service's office designated in the permit.

(d) Duration of permits issued under this section shall be designated on the face of the permit. No permit issued under this section, however, shall be valid for more than one year from the date a notice is published in the FEDERAL REGISTER to review status of such wildlife, or to list such wildlife as endangered, whichever is earlier.

[40 FR 44415, Sept. 26, 1975, as amended at 40 FR 53400, Nov. 18, 1975; 40 FR 58307, Dec. 16, 1975; 50 FR 39688, Sept. 30, 1985]

Subpart D—Threatened Wildlife

§ 17.31 Prohibitions.

(a) Except as provided in subpart A of this part, or in a permit issued under this subpart, all of the provisions in § 17.21 shall apply to threatened wildlife, except § 17.21(c)(5).

(b) In addition to any other provisions of this part 17, any employee or agent of the Service, of the National Marine Fisheries Service, or of a State conservation agency which is operating a conservation program pursuant to the terms of a Cooperative Agreement with the Service in accordance with section 6(c) of the Act, who is designated by his agency for such purposes, may, when acting in the course of his official duties, take those threatened species of wildlife which are covered by an approved cooperative agreement to carry out conservation programs.

(c) Whenever a special rule in §§ 17.40 to 17.48 applies to a threatened species, none of the provisions of paragraphs (a) and (b) of this section will apply. The special rule will contain all the applicable prohibitions and exceptions.

[43 FR 18181, Apr. 28, 1978, as amended at 44 FR 31580, May 31, 1979]

§ 17.32 Permits—general.

Upon receipt of a complete application the Director may issue a permit for any activity otherwise prohibited with regard to threatened wildlife. Such permit shall be governed by the provisions of this section unless a special rule applicable to the wildlife, appearing in §§ 17.40 to 17.48, of this part provides otherwise. Permits issued under this section must be for one of the following purposes: Scientific purposes, or the enhancement of propagation or survival, or economic hardship, or zoological exhibition, or educational purposes, or incidental taking, or special purposes consistent with the purposes of the Act. Such permits may authorize a single transaction, a series of transactions, or a number of activities over a specific period of time.

(a)(1) *Application requirements for scientific purposes, or the enhancement of propagation or survival, or economic hardship, or zoological exhibition, or educational purposes, or special purposes consistent with the purposes of the Act.* Applications for permits under this paragraph must be submitted to the Director, U.S. Fish and Wildlife Service, Federal Wildlife Permit Office, 1000 N. Glebe Road, Room 611, Arlington, Virginia 22201, by the person wishing to engage in the prohibited activity. Each application must be submitted on an official application (Form 3–200), provided by the Service, and must include, as an attachment, as much of the following information which relates to the purpose for which the applicant is requesting a permit:

(i) The Common and scientific names of the species sought to be covered by the permit, as well as the number, age, and sex of such species, and the activity sought to be authorized (such as taking, exporting, selling in interstate commerce);

(ii) A statement as to whether, at the time of application, the wildlife sought to be covered by the permit (A) is still in the wild, (B) has already been removed from the wild, or (C) was born in captivity;

(iii) A resume of the applicant's attempts to obtain the wildlife sought to be covered by the permit in a manner which would not cause the death or removal from the wild of such wildlife;

(iv) If the wildlife sought to be covered by the permit has already been removed from the wild, the country and place where such removal occurred; if the wildlife sought to be covered by permit was born in captivity, the country and place where such wildlife was born;

(v) A complete description and address of the institution or other facility where the wildlife sought to be covered by the permit will be used, displayed, or maintained;

(vi) If the applicant seeks to have live wildlife covered by the permit, a complete description, including photographs or diagrams, of the facilities to house and/or care for the wildlife and a resume of the experience of those persons who will be caring for the wildlife;

(vii) A full statement of the reasons why the applicant is justified in obtaining a permit including the details of the activities sought to be authorized by the permit;

(viii) If the application is for the purpose of enhancement of propagation, a statement of the applicant's willingness to participate in a cooperative breeding program and to maintain or contribute data to a studbook;

(ix) The information collection requirements contained in this paragraph have been approved by the Office of Management and Budget under 44 U.S.C. 3507 and assigned Clearance Number 1018–0022. This information is being collected to provide information necessary to evaluate permit applications and make decisions, according to criteria established in various Federal wildlife and plant conservation statutes and regulations, on the issuance or denial of permits. The obligation to respond is required to obtain or retain a permit.

(2) *Issuance criteria.* Upon receiving an application completed in accordance with paragraph (a)(1) of this section, the Director will decide whether or not a permit should be issued. In making this decision, the Director shall consider, in addition to the general criteria in § 13.21(b) of this subchapter, the following factors:

(i) Whether the purpose for which the permit is required is adequate to justify removing from the wild or otherwise changing the status of the wildlife sought to be covered by the permit;

(ii) The probable direct and indirect effect which issuing the permit would have on the wild populations of the wildlife sought to be covered by the permit;

(iii) Whether the permit, if issued, would in any way, directly or indirectly, conflict with any known program intended to enhance the survival probabilities of the population from which the wildlife sought to be covered by the permit was or would be removed;

(iv) Whether the purpose for which the permit is required would be likely to reduce the threat of extinction facing the species of wildlife sought to be covered by the permit;

(v) The opinions or views of scientists or other persons or organizations having expertise concerning the wildlife or other matters germane to the application; and

(vi) Whether the expertise, facilities, or other resources available to the applicant appear adequate to successfully accomplish the objectives stated in the application.

(3) *Permit conditions.* In addition to the general conditions set forth in part 13 of this subchapter, every permit issued under this paragraph shall be subject to the special condition that the escape of living wildlife covered by the permit shall be immediately reported to the Service office designated in the permit.

(4) *Duration of permits.* The duration of permits issued under this paragraph shall be designated on the face of the permit.

(b)(1) *Application requirements for permits for incidental taking.* (i) Applications for permits under this paragraph must be submitted to the Director, U.S. Fish and Wildlife Service, Federal Wildlife Permit Office, 1000 N. Glebe Road, Room 611, Arlington, VA 22201, by the person wishing to engage in the activity prohibited by § 17.31.

(ii) The director shall publish notice in the FEDERAL REGISTER of each application for a permit that is made under this section. Each notice shall invite the submission from interested parties, within 30 days after the date of the notice, of written data, views, or arguments with respect to the application.

(iii) Each application must be submitted on an official application (Form 3–200) provided by the Service, and must include as an attachment, all of the following information:

(A) A complete description of the activity sought to be authorized;

(B) The common and scientific names of the species sought to be covered by the permit, as well as the number, age, and sex of such species, if known;

(C) A conservation plan that specifies:

(*1*) The impact that will likely result from such taking;

(*2*) What steps the applicant will take to monitor, minimize, and mitigate such impacts, the funding that will be available to implement such steps, and the procedures to be used to deal with unforeseen circumstances;

(*3*) What alternative actions to such taking the applicant considered and the reasons why such alternatives are not proposed to be utilized; and

(*4*) Such other measures that the Director may require as being necessary or appropriate for purposes of the plan.

(iv) The information collection requirements contained in this paragraph have been approved by the Office of Management and Budget under 44 U.S.C. 3507 and assigned Clearance Number 1018–0022. This information is being collected to provide information necessary to evaluate permit applications and make decisions, according to criteria established in various Federal wildlife and plant conservation statutes and regulations on the issuance or denial of permits. The obligation to respond is required to obtain or retain a permit.

(2) *Issuance criteria.* Upon receiving an application completed in accordance with paragraph (b)(1) of this section, the Director will decide whether or not a permit should be issued. The Director shall consider the general criteria in §13.21(b) of this subchapter and shall issue the permit if he finds that: (i) The taking will be incidental; (ii) the applicant will, to the maximum extent practicable, minimize and mitigate the impacts of such taking; (iii) the applicant will ensure that adequate funding for the conservation plan and procedures to deal with unforeseen circumstances will be provided; (iv) the taking will not appreciably reduce the likelihood of the survival and recovery of the species in the wild; (v) the measures, if any, required under paragraph (b)(1)(iii)(D) will be met; and (vi) he has received such other assurances as he may require that the plan will be implemented. In making his decision, the Director shall also consider the anticipated duration and geographic scope of the applicant's planned activities, including the amount of listed species habitat that is involved and the degree to which listed species and their habitats are affected.

(3) *Permit conditions.* In addition to the general conditions set forth in part 13 of this subchapter, every permit issued under this paragraph shall contain such terms and conditions as the Director deems necessary or appropriate to carry out the purposes of the permit and the conservation plan including, but not limited to, monitoring and reporting requirements deemed necessary for determining whether such terms and conditions are being complied with. The Director shall rely upon existing reporting requirements to the maximum extent practicable.

(4) *Duration of permits.* The duration of permits issued under this paragraph shall be sufficient to provide adequate assurances to the permittee to commit funding necessary for the activities authorized by the permit, including conservation activities and land use restrictions. In determining the duration of a permit, the Director shall consider the duration of the planned activities, as well as the possible positive and negative effects associated with permits of the proposed duration on listed species, including the extent to which the conservation plan will enhance the habitat of listed species and increase the long-term survivability of such species.

[50 FR 39689, Sept. 30, 1985]

§17.40 Special rules—mammals.

(a) [Reserved]

(b) Grizzly bear (*Ursus arctos*)—(1) *Prohibitions.* The following prohibitions apply to the grizzly bear:

(i) *Taking.* (A) Except as provided in paragraphs (b)(1)(i)(B) through (F) of this section, no person shall take any grizzly bear in the 48 conterminous states of the United States.

(B) Grizzly bears may be taken in self-defense or in defense of others, but such taking shall be reported, within 5 days of occurrence, to the Assistant Regional Director, Division of Law Enforcement, U.S. Fish and Wildlife Service, P.O. Box 25486, Denver Federal Center, Denver, Colorado 80225 (303/236–7540 or FTS 776–7540), if occurring in Montana or Wyoming, or to the Assistant Regional Director, Division of Law Enforcement, U.S. Fish and Wildlife Service, Lloyd 500 Building, Suite 1490, 500 Northeast Multnomah Street, Portland, Oregon 97232 (503/231–6125 or FTS 429–6125), if occurring in Idaho or Washington, and to appropriate State and Indian Reservation Tribal authorities. Grizzly bears or their parts taken in self-defense or in defense of others shall not be possessed, delivered, carried, transported, shipped, exported, received, or sold, except by Federal, State, or Tribal authorities.

(C) *Removal of nuisance bears.* A grizzly bear consituting a demonstrable but non immediate threat to human safety or committing significant depredations to lawfully present livestock, crops, or beehives may be taken, but only if:

(*1*) It has not been reasonably possible to eliminate such threat or depredation by live-capturing and releasing unharmed in a remote area the grizzly bear involved; and

(*2*) The taking is done in a humane manner by authorized Federal, State, or Tribal authorities, and in accordance with current interagency guidelines covering the taking of such nuisance bears; and

(*3*) The taking is reported within 5 days of occurrence to the appropriate Assistant Regional Director, Division of Law Enforcement, U.S. Fish and Wildlife Service, as indicated in paragraph (b)(1)(i)(B) of this section, and to appropriate State and Tribal authorities.

(D) *Federal, State, or Tribal scientific or research activities.* Federal, State, or Tribal authorities may take grizzly bears for scientific or research purposes, but only if such taking does not result in death or permanent injury to the bears involved. Such taking must be reported within 5 days of occurrence to the appropriate Assistant Regional Director, Division of Law Enforcement, U.S. Fish and Wildlife Service, as indicated in paragraph (b)(1)(i)(B) of this section, and to appropriate State and Tribal authorities.

(E) [Reserved]

(F) *National Parks.* The regulations of the National Park Service shall govern all taking of grizzly bears in National Parks.

(ii) *Unlawfully taken grizzly bears.* (A) Except as provided in paragraphs (b)(1)(ii)(B) and (iv) of this section, no person shall possess, deliver, carry, transport, ship, export, receive, or sell any unlawfully taken grizzly bear. Any unlawful taking of a grizzly bear shall be reported within 5 days of occurrence to the appropriate Assistant Regional Director, Division of Law Enforcement, U.S. Fish and Wildlife Service, as indicated in paragraph (b)(1)(i)(B) of this section, and to appropriate State and Tribal authorities.

(B) Authorized Federal, State, or Tribal employees, when acting in the course of their official duties, may, for scientific or research purposes, possess, deliver, carry, transport, ship, export, or receive unlawfully taken grizzly bears.

(iii) *Import or export.* Except as provided in paragraphs (b)(1)(iii) (A) and (B) and (iv) of this section, no person shall import any grizzly bear into the United States.

(A) *Federal, State, or Tribal scientific or research activities.* Federal, State, or Tribal authorities may import grizzly bears into the United States for scientific or research purposes.

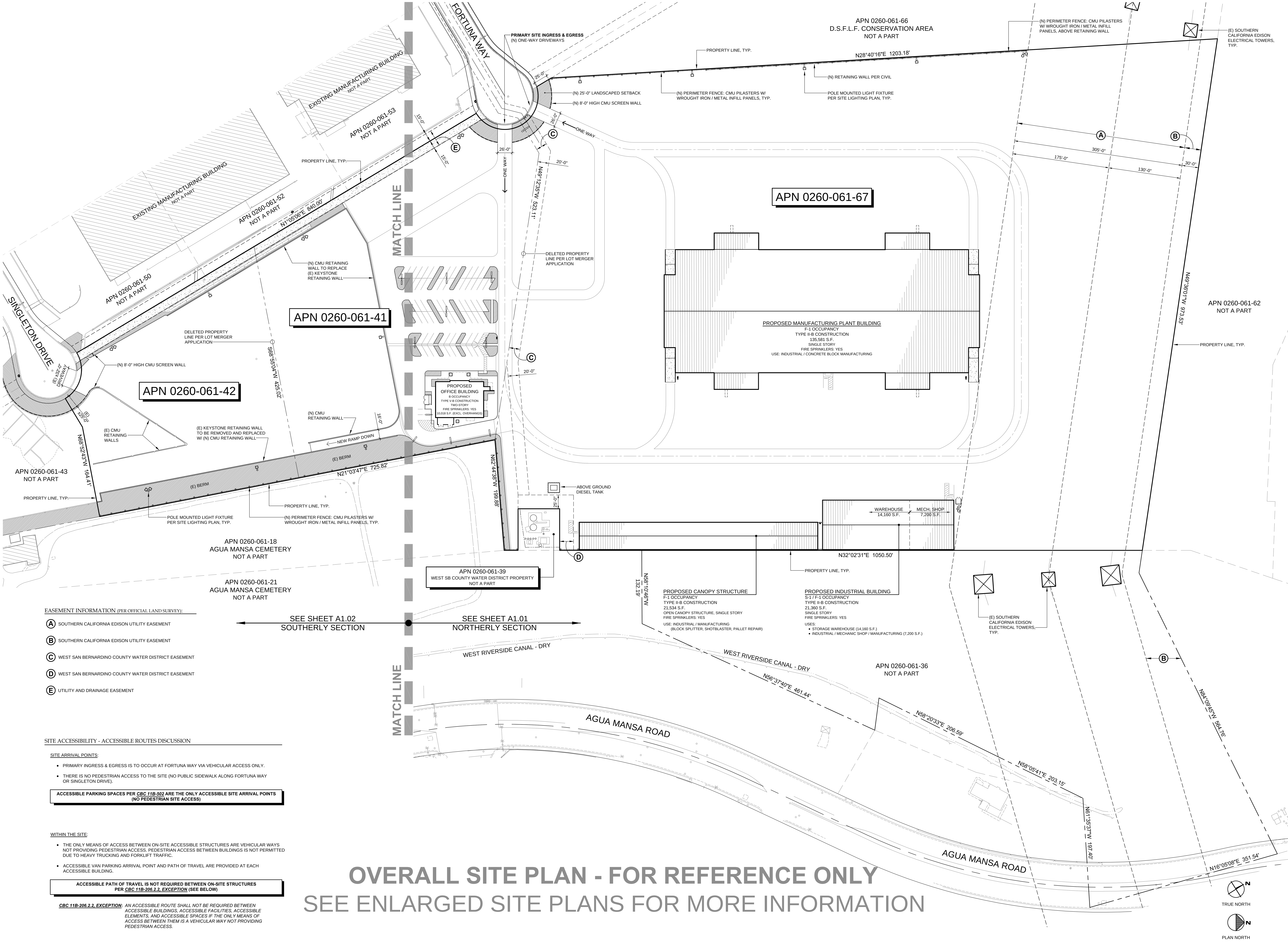
(B) *Public zoological institution.* Public zoological institutions (see 50 CFR 10.12) may import grizzly bears into the United States.

(iv) *Commercial transactions.* (A) Except as provided in paragraph (b)(1)(iv)(B) of this section, no person shall, in the course of commercial activity, deliver, receive, carry, transport, or ship in interstate or foreign commerce any grizzly bear.

(B) A public zoological institution (see 50 CFR 10.12) dealing with other public zoological institutions may sell grizzly bears or offer them for sale in interstate or foreign commerce, and may, in the course of commercial activity, deliver, receive, carry, transport, or ship grizzly bears in interstate or foreign commerce.

(v) *Other violations.* No person shall attempt to commit, cause to be committed, or solicit another to commit

Appendix C – Project Site Plans



EASEMENT INFORMATION (PER OFFICIAL LAND SURVEY):

- (A) SOUTHERN CALIFORNIA EDISON UTILITY EASEMENT
- (B) SOUTHERN CALIFORNIA EDISON UTILITY EASEMENT
- (C) WEST SAN BERNARDINO COUNTY WATER DISTRICT EASEMENT
- (D) WEST SAN BERNARDINO COUNTY WATER DISTRICT EASEMENT
- (E) UTILITY AND DRAINAGE EASEMENT

SITE ACCESSIBILITY - ACCESSIBLE ROUTES DISCUSSION

SITE ARRIVAL POINTS:

- PRIMARY INGRESS & EGRESS IS TO OCCUR AT FORTUNA WAY VIA VEHICULAR ACCESS ONLY.
- THERE IS NO PEDESTRIAN ACCESS TO THE SITE (NO PUBLIC SIDEWALK ALONG FORTUNA WAY OR SINGLETON DRIVE).

ACCESSIBLE PARKING SPACES PER *CBC 11B-502* ARE THE ONLY ACCESSIBLE SITE ARRIVAL POINTS (NO PEDESTRIAN SITE ACCESS)

WITHIN THE SITE:

- THE ONLY MEANS OF ACCESS BETWEEN ON-SITE ACCESSIBLE STRUCTURES ARE VEHICULAR WAYS NOT PROVIDING PEDESTRIAN ACCESS. PEDESTRIAN ACCESS BETWEEN BUILDINGS IS NOT PERMITTED DUE TO HEAVY TRUCKING AND FORKLIFT TRAFFIC.
- ACCESSIBLE VAN PARKING ARRIVAL POINT AND PATH OF TRAVEL ARE PROVIDED AT EACH ACCESSIBLE BUILDING.

ACCESSIBLE PATH OF TRAVEL IS NOT REQUIRED BETWEEN ON-SITE STRUCTURES PER *CBC 11B-206.2.2, EXCEPTION* (SEE BELOW)

CBC 11B-206.2.2, EXCEPTION: *AN ACCESSIBLE ROUTE SHALL NOT BE REQUIRED BETWEEN ACCESSIBLE BUILDINGS, ACCESSIBLE FACILITIES, ACCESSIBLE ELEMENTS, AND ACCESSIBLE SPACES IF THE ONLY MEANS OF ACCESS BETWEEN THEM IS A VEHICULAR WAY NOT PROVIDING PEDESTRIAN ACCESS.*

OVERALL SITE PLAN - FOR REFERENCE ONLY

SEE ENLARGED SITE PLANS FOR MORE INFORMATION

ANGELUS BLOCK CO., INC.
PROPOSED MANUFACTURING FACILITY
APN'S: 0260-061-67-0000, 0260-061-41-0000, 0260-061-42-0000
RIALTO, CA 92316

Mark | Revisions | Date

LICENSED ARCHITECT
FRANK J. LONI
C-35616
REN. 7/31/2021
STATE OF CALIFORNIA

LONI architects
LONI, INC.
architecture + engineering
1050 Lakes Dr. #225 | West Covina, CA 91790
T: 626.588.1977
E: admin@loniarchitects.com
www.loniarchitects.com

Permit No.
Permit Date
Drawn By: F. LONI
Signed: 2/10/2021
Sheet: A1.00
Job Number: 19-050

Appendix D – Photographs from the Survey Area

APPENDIX D. PHOTOGRAPHS FROM THE ANGELES BLOCK COMPANY SURVEY AREA

Photo 1 – Project Site view from southeast corner facing northeast. Looking across the developed area (DEV) in the southern portion of the Project Site.

Photo 2 – Project Site view from northeast corner facing south at the Wild Oats and Annual Brome Grasslands (WOABG) vegetation and disturbed (DIST) area along the dirt road.

APPENDIX D. PHOTOGRAPHS FROM THE ANGELES BLOCK COMPANY SURVEY AREA

Photo 3 – Project Site view of northeast corner from center of the Project Site, facing southeast. View of the California Buckwheat Scrub (CBS) vegetation community.

Photo 4 – View of Project Site from the center of northwest perimeter fence, facing north. View of the California Buckwheat Scrub (CBS) vegetation community.

APPENDIX D. PHOTOGRAPHS FROM THE ANGELES BLOCK COMPANY SURVEY AREA

Photo 5 –Project Site view from southern center facing north. View of Wild Oats and Annual Brome Grasslands (WOABG) vegetation that covers much of the Project Site.

Photo 6 – South side of the Project Site facing northwest. View of Wild Oats and Annual Brome Grasslands (WOABG) vegetation that covers much of the Project Site.

APPENDIX D. PHOTOGRAPHS FROM THE ANGELES BLOCK COMPANY SURVEY AREA

Photo 7 – View of the small portion of California Buckwheat Scrub (CBS) vegetation community with a few representatives of coyote bush, surrounded by developed (DEV) area within the center of the Project Site.

Photo 8 – View of Rivers and Land Conservancy Parcel for Delhi Sands flower-loving fly (DSFLF) that borders the west-side of the Project Site. The Project Site perimeter fence between the two parcels in the foreground. View facing northwest. Note: There is no public access to this parcel. This area was not surveyed.

APPENDIX D. PHOTOGRAPHS FROM THE ANGELES BLOCK COMPANY SURVEY AREA

Photo 9 – Redtail-hawk nest in the lattice tower on the right at the center top. Adult and fledglings in the lattice tower on the top left. Project site perimeter fence in the foreground. View facing northwest.

Photo 10 – View of the Project Site from the southeast side, facing north. The vacant corvid nests are located in the lattice tower furthest north. View of Wild Oats and Annual Brome Grasslands (WOABG) vegetation that covers much of the Project Site.

Photo 11 – Corvid nest, vacant. Located at the end of the lattice tower lower crossarm.

Photo 12 – Corvid nest, vacant. Located at the end of the lattice tower middle crossarm.

Appendix E – Plant Species Observations during the Survey

Appendix E. Plant Species Observations during the Survey

SCIENTIFIC NAME (* introduced/nonnative species)	COMMON NAME
AMARANTHACEAE – AMARANTH FAMILY	
**Amaranthus albus*	prostrate pigweed
APIACEAE – CARROT FAMILY	
**Ciclospermum leptophyllum*	marsh parsley
ASTERACEAE – SUNFLOWER FAMILY	
Ambrosia acanthicarpa	annual bur-sage
Ambrosia psilostachya	Ragweed
Artemisia californica	California sagebrush
Baccharis salicifolia	mule fat
Baccharis sarothroides	desertbroom baccharis
**Cirsium vulgare*	bullthistle
Centaurea melitensis	Tocalote
Corethrogyne filaginifolia	common sandaster
Dicoria canescens	Desert dicoria
Erigeron canadensis	Canadian horseweed
Encelia farinosa	Brittle bush
Gutierrezia californica	California matchweed
Logfia californica	California cottonrose
Helianthus annuus	Common sunflower
Heterotheca grandiflora	telegraph weed
**Lactuca serriola*	prickly lettuce
Lessingia glandulifera	valley vinegar weed
Malacothrix saxatilis	short leaved aster
**Oncosiphon piluliferum*	Stinknet
Stephanomeria diegensis	San Diego wreathplant
**Verbesina encelioides*	
BORAGINACEAE – BORAGE FAMILY	
Amsinckia intermedia	common fiddleneck
Cryptantha muricata	pointed cryptantha
Cyrptantha sp.	
BRASSICACEAE – MUSTARD FAMILY	
**Hirshfeldia incana*	short-podded mustard
**Sisymbrium irio*	London rocket
CACTACEAE – CACTUS FAMILY	
Opuntia ×vaseyi	Vasey's prickly pear
CARYOPHYLLACEAE – CARNATION FAMILY	
Loeflingia squarrosa	spreading loeflingia

CHENOPODIACEAE – GOOSEFOOT FAMILY	
Chenopodium berlandieri	pit-seeded goosefoot
**Salsola tragus*	Russian thistle
EUPHORBIACEAE – SPURGE FAMILY	
Croton californicus	California croton
Croton setigerus	turkey-mullein
**Euphorbia maculata*	spotted spurge
Stillingia linearifolia	narrow leaved stillingia
FABACEAE (LEGUMINOSAE) – PEA FAMILY	
Acmispon americanus	Parish's lotus
Acmispon glaber	short winged deerweed
Astragalus pomonensis	Pomona milkvetch
GERANIACEAE – GERANIUM FAMILY	
**Erodium cicutarium*	red-stem Filaree
LAMIACEAE (LABIATAE) – MINT FAMILY	
**Marrubium vulgare*	horehound
ONAGRACEAE – EVENING PRIMROSE FAMILY	
Camissonia micrantha	miniature suncup
Eulobus californicus	
Oenothera californica	California primrose
PLANTAGINACEAE – PLANTAIN FAMILY	
Plantago erecta	California plantain
POACEAE (GRAMINEAE) – GRASS FAMILY	
**Avena barbata*	slender wild oat
**Bromus diandrus*	
**Bromus madritensis* subsp. *rubens*	red brome
Eragrostis mexicana	Mexican lovegrass
**Festuca myuros*	rattail six weeks grass
**Hordeum murinum*	mouse barley
**Schismus barbatatus*	common Mediterranean grass
**Triticum aestivum*	common wheat
POLYGONACEAE – BUCKWHEAT FAMILY	
Eriastrum sapphirinum	Sapphire eriastrum
Eriogonum fasciculatum var. *polifolium*	California buckwheat
Eriogonum gracile	Slender buckwheat
Lastarriaea coriacea	leather spineflower
Rumex hymenosepalus	Wild rhubarb
SALICACEAE – WILLOW FAMILY	

Salix exigua	sandbar willow
SOLANACEAE – NIGHTSHADE FAMILY	
Datura wrightii	Wright's datura
**Nicotiana glauca*	tree tobacco
Nicotiana quadrivalis	Indian tobacco
ZYGOPHYLLACEAE – CALTROP FAMILY	
**Tribulus terrestris*	puncture vine

Appendix F – Potential to Occur Table

Scientific Name	Common Name	Federal Status	State Status	CDFW Status (FP: Fully Protected, SSC: Species of Special Concern, WL: Watch List)	CA Rare Plant Rank	Family	Potential to Occur
AMPHIBIANS							
Rana draytonii	California red-legged frog	Threatened	None	SSC	-	Ranidae	Absent: no suitable habitat, wetland/riparian species.
Rana muscosa	southern mountain yellow-legged frog	Endangered	Endangered	WL	-	Ranidae	Absent: no suitable habitat, wetland/riparian species.
Taricha torosa	Coast Range newt	None	None	SSC	-	Salamandridae	Absent: no suitable habitat, wetland/riparian species.
Spea hammondii	western spadefoot	None	None	SSC	-	Scaphiopodidae	Absent: no suitable habitat, riparian species.
BIRDS							
Accipiter cooperii	Cooper's hawk	None	None	WL	-	Accipitridae	Potential: Foraging habitat only.
Accipiter gentilis	northern goshawk	None	None	SSC	-	Accipitridae	Absent: no suitable habitat.
Accipiter striatus	sharp-shinned hawk	None	None	WL	-	Accipitridae	Potential: Foraging habitat only.
Aquila chrysaetos	golden eagle	None	None	FP ; WL	-	Accipitridae	Potential: Foraging habitat only.
Buteo regalis	ferruginous hawk	None	None	WL	-	Accipitridae	Potential: Foraging habitat only.
Buteo swainsoni	Swainson's hawk	None	Threatened	-	-	Accipitridae	Potential: Foraging habitat only.
Circus hudsonius	northern harrier	None	None	SSC	-	Accipitridae	Potential: Foraging habitat only.
Elanus leucurus	white-tailed kite	None	None	FP	-	Accipitridae	Potential: Foraging habitat only.
Haliaeetus leucocephalus	bald eagle	Delisted	Endangered	FP	-	Accipitridae	Absent: no suitable habitat.
Eremophila alpestris actia	California horned lark	None	None	WL	-	Alaudidae	Potential
Chaetura vauxi	Vaux's swift	None	None	SSC	-	Apodidae	Absent: no suitable habitat.
Gymnogyps californianus	California condor	Endangered	Endangered	FP	-	Cathartidae	Absent: no suitable habitat.
Coccyzus americanus occidentalis	western yellow-billed cuckoo	Threatened	Endangered	-	-	Cuculidae	Absent: no suitable habitat, riparian species.
Falco columbarius	merlin	None	None	WL	-	Falconidae	Absent: no suitable habitat.
Falco mexicanus	prairie falcon	None	None	WL	-	Falconidae	Low potential: Foraging only.
Falco peregrinus anatum	American peregrine falcon	Delisted	Delisted	FP	-	Falconidae	Low potential: Foraging only.
Progne subis	purple martin	None	None	SSC	-	Hirundinidae	Low potential: Foraging only.
Agelaius tricolor	tricolored blackbird	None	Threatened	SSC	-	Icteriidae	Absent: no suitable habitat, riparian species.
Xanthocephalus xanthocephalus	yellow-headed blackbird	None	None	SSC	-	Icteriidae	Absent: no suitable habitat, riparian species.
Icteria virens	yellow-breasted chat	None	None	SSC	-	Icteriidae	Absent: no suitable habitat, riparian species.
Lanius ludovicianus	loggerhead shrike	None	None	SSC	-	Laniidae	Potential: Foraging only.
Larus californicus	California gull	None	None	WL	-	Laridae	Potential: Due to dump to the north.
Pandion haliaetus	osprey	None	None	WL	-	Pandionidae	Absent: no suitable habitat, riparian species.
Setophaga petechia	yellow warbler	None	None	SSC	-	Parulidae	Absent: no suitable habitat, riparian species.

Aimophila ruficeps canescens	southern California rufous-crowned sparrow	None	None	WL	-	Passerellidae	Absent: no suitable habitat, prefers open hillsides with rocks and scattered scrubs.
Ammodramus savannarum	grasshopper sparrow	None	None	SSC	-	Passerellidae	Potential: Foraging only.
Artemisiospiza belli belli	Bell's sage sparrow	None	None	WL	-	Passerellidae	Potential: habitat within the California Buckwheat Scrub
Pelecanus erythrorhynchos	American white pelican	None	None	SSC	-	Pelecanidae	Absent: no suitable habitat, wetland species.
Phalacrocorax auritus	double-crested cormorant	None	None	WL	-	Phalacrocoracidae	Absent: no suitable habitat, wetland species.
Polioptila californica californica	coastal California gnatcatcher	Threatened	None	SSC	-	Polioptilidae	Low potential: Due to historical records. No contiguous habitat on site.
Coturnicops noveboracensis	yellow rail	None	None	SSC	-	Rallidae	Absent: no suitable habitat, wetland species.
Laterallus jamaicensis coturniculus	California black rail	None	Threatened	FP	-	Rallidae	Absent: no suitable habitat, wetland species.
Numenius americanus	long-billed curlew	None	None	WL	-	Scolopacidae	Absent: no suitable habitat, wetland species.
Asio flammeus	short-eared owl	None	None	SSC	-	Strigidae	Potential: Foraging only.
Asio otus	long-eared owl	None	None	SSC	-	Strigidae	Potential: Foraging only.
Athene cunicularia	burrowing owl	None	None	SSC	-	Strigidae	Potential: Historical records located approximately 0.8 miles southwest of the Survey Area.
Strix occidentalis occidentalis	California Spotted Owl	None	None	SSC	-	Strigidae	Absent: no suitable habitat, old growth forest species.
Plegadis chihi	white-faced ibis	None	None	WL	-	Threskiornithidae	Absent: no suitable habitat, wetland species.
Contopus cooperi	olive-sided flycatcher	None	None	SSC	-	Tyrannidae	Absent: no suitable habitat, woodland species.
Empidonax traillii	willow flycatcher	None	Endangered	-	-	Tyrannidae	Absent: no suitable habitat, riparian species.
Empidonax traillii extimus	southwestern willow flycatcher	Endangered	Endangered	-	-	Tyrannidae	Absent: no suitable habitat, riparian species.
Pyrocephalus rubinus	vermilion flycatcher	None	None	SSC	-	Tyrannidae	Absent: no suitable habitat, riparian species.
Vireo bellii pusillus	least Bell's vireo	Endangered	Endangered	-	-	Vireonidae	Absent: no suitable habitat, riparian species.
CRUSTACEANS							
Streptocephalus woottoni	Riverside fairy shrimp	Endangered	None	-	-	Streptocephalidae	Absent: no suitable habitat, vernal pool species.
FISH							
Catostomus santaanae	Santa Ana sucker	Threatened	None	-	-	Catostomidae	Absent: no suitable habitat, wetland species.
Gila orcuttii	arroyo chub	None	None	SSC	-	Cyprinidae	Absent: no suitable habitat, wetland species.
Rhinichthys osculus ssp. 3	Santa Ana speckled dace	None	None	SSC	-	Cyprinidae	Absent: no suitable habitat, wetland species.
Oncorhynchus mykiss irideus pop. 10	steelhead - southern California DPS	Endangered	None	-	-	Salmonidae	Absent: no suitable habitat, wetland species.
INSECTS							
Bombus crotchii	Crotch bumble bee	None	Candidate Endangered	-	-	Apidae	Moderate Potential

Rhaphiomidas terminatus abdominalis	Delhi Sands flower-loving fly	Endangered	None	-	-	Mydidae	Present: Assumed present due to adjacent records and historical records on site.
Euphydryas editha quino	quino checkerspot butterfly	Endangered	None	-	-	Nymphalidae	Absent: no suitable habitat.
MAMMALS							
Chaetodipus fallax fallax	northwestern San Diego pocket mouse	None	None	SSC	-	Heteromyidae	Absent: no suitable habitat.
Chaetodipus fallax pallidus	pallid San Diego pocket mouse	None	None	SSC	-	Heteromyidae	Absent: no suitable habitat.
Dipodomys merriami parvus	San Bernardino kangaroo rat	Endangered	Candidate Endangered	SSC	-	Heteromyidae	Absent: no suitable habitat.
Dipodomys stephensi	Stephens' kangaroo rat	Endangered	Threatened	-	-	Heteromyidae	Absent: no suitable habitat.
Perognathus alticola alticola	white-eared pocket mouse	None	None	SSC	-	Heteromyidae	Absent: no suitable habitat.
Perognathus longimembris brevinasus	Los Angeles pocket mouse	None	None	SSC	-	Heteromyidae	Potential: prefers fine sand soils and open ground.
Perognathus longimembris pacificus	Pacific pocket mouse	Endangered	None	SSC	-	Heteromyidae	Absent: no suitable habitat.
Lepus californicus bennettii	San Diego black-tailed jackrabbit	None	None	SSC	-	Leporidae	Low potential: habitat not typical.
Eumops perotis californicus	western mastiff bat	None	None	SSC	-	Molossidae	Low potential: foraging only.
Nyctinomops femorosaccus	pocketed free-tailed bat	None	None	SSC	-	Molossidae	Absent: no suitable habitat
Microtus californicus mohavensis	Mohave river vole	None	None	SSC	-	Muridae	Absent: no suitable habitat.
Neotoma lepida intermedia	San Diego desert woodrat	None	None	SSC	-	Muridae	Absent: no suitable habitat.
Onychomys torridus ramona	southern grasshopper mouse	None	None	SSC	-	Muridae	Absent: no suitable habitat.
Taxidea taxus	American badger	None	None	SSC	-	Mustelidae	Absent: no suitable habitat.
Glaucomys oregonensis californicus	San Bernardino flying squirrel	None	None	SSC	-	Sciuridae	Absent: habitat not suitable
Antrozous pallidus	pallid bat	None	None	SSC	-	Vespertilionidae	Low potential: foraging only.
Lasiurus xanthinus	western yellow bat	None	None	SSC	-	Vespertilionidae	Absent: no suitable habitat.
REPTILES							
Anniella pulchra	northern California legless lizard	None	None	SSC	-	Anniellidae	Moderate: known from Delhi sands.
Charina umbratica	southern rubber boa	None	Threatened	-	-	Boidae	Absent: habitat not suitable
Arizona elegans occidentalis	California glossy snake	None	None	SSC	-	Colubridae	Absent: no suitable habitat
Salvadora hexalepis virgultea	coast patch-nosed snake	None	None	SSC	-	Colubridae	Absent: no suitable habitat.
Emys marmorata	western pond turtle	None	None	SSC	-	Emydidae	Absent: no suitable habitat, wetland species.
Coleonyx variegatus abbotti	San Diego banded gecko	None	None	SSC	-	Gekkonidae	Absent: no suitable habitat.
Thamnophis hammondii	two-striped gartersnake	None	None	SSC	-	Natricidae	Absent: no suitable habitat, wetland species.
Phrynosoma blainvillii	coast horned lizard	None	None	SSC	-	Phrynosomatidae	Potential
Aspidoscelis hyperythra	orange-throated whiptail	None	None	WL	-	Teiidae	Potential
Aspidoscelis tigris stejnegeri	coastal whiptail	None	None	SSC	-	Teiidae	Potential
Crotalus ruber	red-diamond rattlesnake	None	None	SSC	-	Viperidae	Potential
PLANTS							
Centromadia pungens ssp. laevis	smooth tarplant	None	None	-	1B.1	Asteraceae	Absent: no suitable habitat, no occurrences within 5 mi.
Deinandra paniculata	paniculate tarplant	None	None	-	4.2	Asteraceae	Low: Closest populations in the Jurupa hills, not encountered on Delhi series soils.
Eriophyllum lanatum var. obovatum	southern Sierra woolly sunflower	None	None	-	4.3	Asteraceae	Absent: no suitable habitat.

Helianthus nuttallii ssp. parishii	Los Angeles sunflower	None	None	-	1A	Asteraceae	Absent: no suitable habitat, historically known from moist meadows and wetlands in the area
Hulsea vestita ssp. parryi	Parry's hulsea	None	None	-	4.3	Asteraceae	Absent: no suitable habitat.
Lasthenia glabrata ssp. coulteri	Coulter's goldfields	None	None	-	1B.1	Asteraceae	Absent: no suitable habitat, known from alkali and ephemeral wetlands.
Senecio aphanactis	chaparral ragwort	None	None	-	2B.2	Asteraceae	Low: not encounteded on sandy soils.
Symphyotrichum defoliatum	San Bernardino aster	None	None	-	1B.2	Asteraceae	Absent: no suitable habitat
Caulanthus simulans	Payson's jewelflower	None	None	-	4.2	Brassicaceae	Absent: no suitable habitat
Lepidium virginicum var. robinsonii	Robinson's pepper-grass	None	None	-	4.3	Brassicaceae	Low: habitat marginal for species, few records from the area.
Nasturtium gambelii	Gambel's water cress	Endangered	Threatened	-	1B.1	Brassicaceae	Absent: no suitable habitat, wetland species.
Streptanthus campestris	southern jewelflower	None	None	-	1B.3	Brassicaceae	Absent: no suitable habitat.
Arenaria paludicola	marsh sandwort	Endangered	Endangered	-	1B.1	Caryophyllaceae	Absent: no suitable habitat, historically known from wetlands in vicinity of San Bernardino.
Convolvulus simulans	small-flowered morning-glory	None	None	-	4.2	Convolvulaceae	Absent: no suittable habitat, not encountered on sandy soils
Phacelia stellaris	Brand's star phacelia	None	None	-	1B.1	Hydrophyllaceae	Low: species known historically from the area, habiat conditions onsite marginal due to high exotic annual cover.
Monardella macrantha ssp. hallii	Hall's monardella	None	None	-	1B.3	Lamiaceae	Absent: no suitable habitat.
Monardella pringlei	Pringle's monardella	None	None	-	1A	Lamiaceae	Low: specis considered likely extinct , endemic to Delhi sands.
Calochortus palmeri var. palmeri	Palmer's mariposa-lily	None	None	-	1B.2	Liliaceae	Absent: habitat innapropriate, not recorded from Delhi Sands
Abronia villosa var. aurita	chaparral sand-verbena	None	None	-	1B.1	Nyctaginaceae	Low: habitat marginal, not known from area.
Eriastrum densifolium ssp. sanctorum	Santa Ana River woollystar	Endangered	Endangered	-	1B.1	Polemoniaceae	Absent: not recorded from Delhi Sands, found in alluvial scrub in the Santa Ana River drainage.
Chorizanthe leptotheca	Peninsular spineflower	None	None	-	4.2	Polygonaceae	Low: Habiat marginal for the species.
Chorizanthe parryi var. parryi	Parry's spineflower	None	None	-	1B.1	Polygonaceae	Low: Habiat marginal for the species.
Chorizanthe xanti var. leucotheca	white-bracted spineflower	None	None	-	1B.2	Polygonaceae	Low: Habiat marginal for the species.
Dodecahema leptoceras	slender-horned spineflower	Endangered	Endangered	-	1B.1	Polygonaceae	Absent: no suitable habiat
Horkelia cuneata var. puberula	mesa horkelia	None	None	-	1B.1	Plants - Vascular - Rosaceae	Low: Most available habitat onsite marginal.
Thelypteris puberula var. sonorensis	Sonoran maiden fern	None	None	-	2B.2	Thelypteridaceae	Absent: habitat innapropriate for species.

Brodiaea filifolia	thread-leaved brodiaea	Threatened	Endangered	-	1B.1	Themidaceae	Absent: no suitable habiat

KEY:	
California Rare Plant Rank:	
Plants presumed extirpated in California and either rare or extinct elsewhere (CRPR 1A)	California Rare Plant Rank of 1A are presumed extirpated or extinct because they have not been seen or collected in the wild in California for many years. A plant is extinct if it no longer occurs anywhere. A plant that is extirpated from California has been eliminated from California, but may still occur elsewhere in its range.
Plants rare, threatened, or endangered in California and elsewhere (CRPR 1B)	California Rare Plant Rank of 1B are rare throughout their range with the majority of them endemic to California. Most of the plants that are ranked 1B have declined significantly over the last century.
Plants presumed extirpated in California but common elsewhere (CRPR 2A)	California Rare Plant Rank of 2A are presumed extirpated because they have not been observed or documented in California for many years. This list only includes plants that are presumed extirpated in California, but more common elsewhere in their range.
Plants rare, threatened, or endangered in California but more common elsewhere (CRPR 2B)	Except for being common beyond the boundaries of California, plants with a California Rare Plant Rank of 2B would have been ranked 1B. From the federal perspective, plants common in other states or countries are not eligible for consideration under the provisions of the Federal Endangered Species Act.
Review List: Plants about which more information is needed (CRPR 3)	Plants with a California Rare Plant Rank of 3 are united by one common theme – we lack the necessary information to assign them to one of the other ranks or to reject them. Nearly all of the plants constituting California Rare Plant Rank 3 are taxonomically problematic.
Watch List: Plants of limited distribution (CRPR 4)	Plants with a California Rare Plant Rank of 4 are of limited distribution or infrequent throughout a broader area in California, and their status should be monitored regularly.
<u>*Threat Ranks*</u>	
Ranks at each level also include a threat rank (e.g., ,CRPB 4.3) and are determined as follows:	
0.1-Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat)	
0.2-Moderately threatened in California (20-80% occurrences threatened / moderate degree and immediacy of threat)	
0.3-Not very threatened in California (less than 20% of occurrences threatened / low degree and immediacy of threat or no current threats known)	

Appendix E

Cultural Resources Study

Cultural Resources Assessment of the Angelus Block Project, Rialto, San Bernardino County, California

Prepared for
Angelus Block Company, Inc.
3435 S. Riverside Ave.
Rialto, California 97316

Prepared by
WHPacific
AN NV5 COMPANY

9755 SW Barnes Rd, Ste 300, Portland, OR 97225
Enhancing Communities through Creative, Exceptional Service
NMSDC Certified MBE/CPUC Certified MBE

Cultural Resources Assessment of the Angelus Block CEQA Project, Rialto, San Bernardino County, California

Prepared for
John D. Quigley, P.E.
Manager

Angelus Block Co., Inc.
3435 S. Riverside Ave.
Rialto, CA 91316

Prepared by
Karry L. Blake
and
Sarah R. Brownell

Project Manager
Karry L. Blake

WHPacific, Inc. an NV5 Company
9755 SW Barnes Rd, Ste 300
Portland, OR 97225
503.362.4675
www.whpacific.com

Findings:	Negative
Counties:	San Bernardino County, CA
Legal Location (TRS):	T1S, R5W, Sections 35 & 36
USGS Quads:	San Bernardino South, CA
Project Type:	Pedestrian survey
Project Acres:	29
Acres Surveyed:	29
WHPacific Project No.:	444720-0009598.01
Field Notes Location:	WHPacific Office, Portland, OR

November 20, 2020

Table of Contents

List of Figures

List of Tables

Abstract

NV5 archaeological staff conducted a cultural resources survey including background research and pedestrian survey for the proposed development of a 29-acre parcel in Rialto, California. This property is privately held by the Angelus Block Company. A systematic pedestrian survey of the parcel with transects no more than 15 meters apart was conducted. No cultural resources were encountered during the survey. The proposed development is adjacent to a known California Historic Landmark, Agua Mansa Pioneer Cemetery, excavation is not planned at this time near this historic resource. An existing berm is outside of the protective fencing surrounding the cemetery on the Angelus property which is to be enhanced during the construction of an access road. Due to the proximity of the historic period cemetery, it is recommended that an Inadvertent Discovery Plan be followed during the project construction to assure procedures are followed in the unlikely event any archaeological materials, sites, or human remains are discovered. NV5 recommends that no further archaeological work is needed, and project development should proceed as planned.

Introduction

NV5 has been contracted by Angelus Block Company, Inc. (Angelus Block) to provide environmental compliance services including a cultural resources survey for the proposed construction of a new manufacturing facility in Rialto, San Bernardino County, California. The project is located on private property that is primarily undeveloped, but a portion is being used for material discard from the adjacent E-Z Mix facility. The property is in Sections 35 and 36 of Township 1 South, Range 5 West, Willamette Meridian (Figure 1). This technical report presents the results of the cultural resource survey of the proposed development. These results will be included in the California Environmental Quality Act Compliance (CEQA) Initial Study document. Prior to the current survey no previous cultural resources surveys had occurred within the project area.

Project Background

Angelus Block is proposing the construction of a new concrete block production facility in Rialto, CA adjacent to existing manufacturing properties. Angelus Block submitted plans for the proposed facility to the City of Rialto in February 2020 who determined that the project must comply with the CEQA. The area of potential effect (APE) for this project is defined by property boundaries as the entire site will be graded. The property is located on previously undeveloped land between West Agua Mansa Road and Industrial Drive accessed via Fortuna Way. Development plans covers an irregularly shaped 29-acres and includes a new manufacturing facility, two-story administration building, an industrial building, industrial warehouse building, a metal canopy, and associated parking and paving to allow truck access. The southern third of the project area overlaps with the existing Angelus Block and E-Z Mix facilities (Figures 2 and 3). A secured chain link fence currently separates the undeveloped portion of the property from the developed manufacturing facilities (Figure 4). Immediately southeast of the property is the fenced off Agua Mansa Cemetery (Figures 1 and 2). This is buffered by a dirt berm outside of the protective fence line on the Angelus Block property. Public utilities crossing the property include a 20-foot water easement from Fortuna Way to the existing well just north of the Agua Mansa Cemetery. Southern California Edison has a 335-foot easement along the northern boundary of the property for a transmission line.

Regulatory Context

As communicated by the City of Rialto, the proposed project is subject to compliance with CEQA and the CEQA Guidelines, as amended to date. This regulation directs public agencies to avoid damaging archaeological resources when feasible or to evaluate an archaeological resource if avoidance cannot be achieved. Evaluation of the importance of the resource will then be used to determine impact and mitigation measures. As part of this process it must be determined if there is a potential for the project to impact archaeological or historical cultural resources that are significant under CEQA. Significant "historic resource" is one that is listed or determined eligible for listing in the California Register of Historical Resources (CRHR), included in a local register of historical resources, or is determined by a lead agency to be a historical resource. Eligibility criteria for the CRHR are the same as those for the National Register of Historic Places as defined by 36 CFR 60.4. This cultural resource survey was undertaken to determine if historic resources are present with the proposed APE and access their significance.

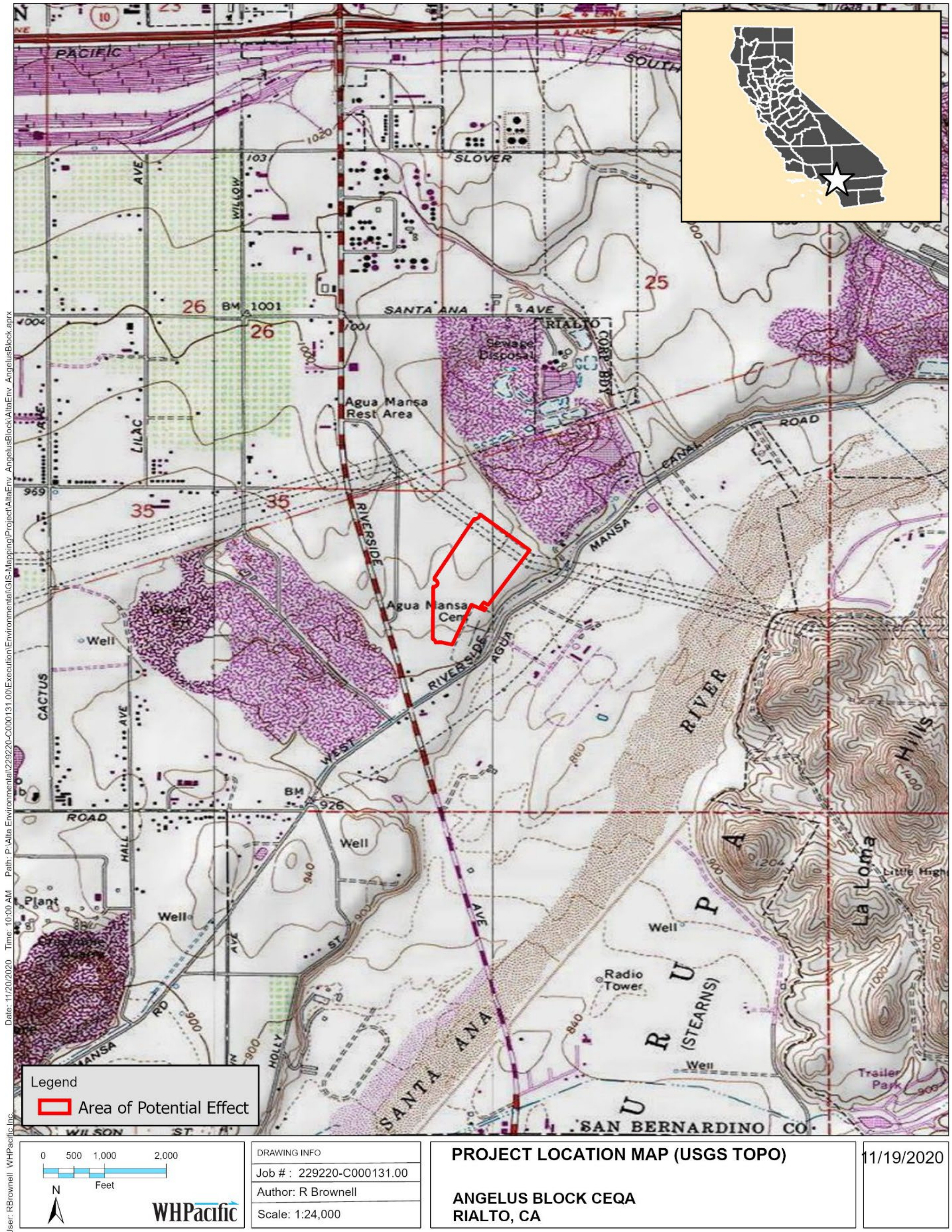


Figure 1. Topographic overview of project area and location of the project APE

Figure 2: Aerial Overview of the APE

Figure 3 Overview of existing facilities in the southern third of the project area, view to the southwest.

Figure 4 Overview of fence line (left), disposal pile (center), and general disturbance, view to the northwest.

Environmental Setting

Ranging in elevation from 914 ft to 938 ft (279 m to 286 m) above sea level, the APE is in the San Bernardino Valley 0.5 miles west of the Santa Ana River in the southern part of the ty of Colton. The Jurupa Mountains rise two miles to the southwest and La Loma Hills are located 0.75 miles away on the east side of the Santa Ana River. The San Bernardino Mountains are 13 miles to the north with the San Gabriel Mountains 12 miles to the northwest. Due to severe flood events, the Prado Dam was constructed on the Santa Ana River in 1936 (Ahlborn 1982).

The project area is in the Inland Valleys portion of the Southern California/Northern Baja Coast ecoregion. The Inland Valleys includes alluvial fans and basin floors immediately south and west of the San Gabriel and San Bernardino Mountains. It also contains some floodplains along the Santa Ana River. Historically, native vegetation would have included Riversidean coastal sage scrub, valley grasslands, and some riparian woodlands (Griffith et al .2016). The region has a Mediterranean climate with hot summers and cool winters with almost all precipitation occurring in the winters (Kauffman 2003).

Today the ecoregion is heavily developed. The southern third of the APE is heavily disturbed by machine activity and use as a materials discard location. Although cut by numerous dirt roads, there is some native vegetation in the north central portion of the APE including sedge and Sacred Datura (*Datura wrightii)* (Figures 5 and 6). Soils in the APE are predominantly Delhi fine sand with a small sliver of Tujunga gravelly loamy sand along the southeastern edge of the project. Delhi fine sand forms on alluvial fans consisting of sandy alluvium derived from granite. It is somewhat excessively drained but classified as prime farmland if irrigated. Tujunga gravelly loamy sand also forms on alluvial fans from granite-derived alluvium. It contains more gravel than Delhi and is "not prime farmland".

Figure 5. Overview of the north central portion of the APE, view to the north.

Archaeological Overview

Cultural resource overviews of the San Bernardino valley and inland southern California indicate that evidence of human occupation in the region begin approximately 8,500 years ago. Archaeological evidence points to early hunter and gatherer cultures exploiting a diversity of resources with an increase in plant food resources over time (Alttschul et al. 1984 and Moratto 1984).

Early Holocene (ca. 11,000 to 1000 B.P.) occupation of the area is evidenced by the San Dieguito Complex. Archaeological sites from the Complex are dominated by flaked stone tool assemblages including large flake-and-core scrapers, choppers, hammers, drills, and gravers with little ground stone evident (Warren 1967). There is no clear interpretation of the cultural group of the period and it has been characterized it as both a hunting-dominant culture and a more generalized foraging culture. Sites from the period are generally found along ancient lake terraces in coastal San Diego County or on the islands off the Pacific coast (Gallegos 1987).

Figure 6 Overview of the northwest quadrant of the project area illustrating native surface and access road, view to the northwest.

The archaeological record becomes more well documented for the Middle Holocene (ca. 8000 and 1000 B.P.). During this period a manifestation of the archaeological phenomenon known as the Millingstone Horizon dominated the archaeological record in California (True 1980). In southern California the expression of this archaeology became known as the Encinitas Tradition and more locally to inland San Bernardino, Riverside, Orange, and Los Angeles Counties, as the Greven Knoll pattern (Sutton and Gardner 2010). The Greven Knoll pattern encompasses sites dating from ca. 9400 to 1000 BP and is further divided into Greven Knoll I, II, and III. However, for these purposes, it can be said that the Greven Knoll pattern generally demonstrates a large shift from the hunting-related assemblages of the Early Holocene to assemblages dominated by plant processing technologies such as large numbers of manos and metates with other finds including core tools, hammerstones, large dart points, flexed inhumations, and occasional cremations. Notably, scrapers are largely absent. The Greven Knoll pattern also lacks evidence of shellfish and shell beads indicating potentially limited contact with the coast (Sutton and Gardner 2010).

During the Late Holocene (ca. 1,000 BP to Euro-American influence and contact in the mid-18th to early-19th centuries) the Greven Knoll pattern generally continued until distinctive new traits emerged around AD 500 (Warren et al. 2008). This period, between AD 500 and European Contact, was characterized by the appearance of small, pressure-flaked arrow points, indicating the arrival of bow-and-arrow technology. In addition, cremations replaced flexed inhumations, and use of mortar and pestle technology was extensive with an emphasis on processing plant foods, particularly acorns. Changes during this period were likely the result of a variety of factors including environmental changes and an influx of Takic speakers from the east (Christenson 1990).

Ethnographic Background

The project is located near the eastern edge of traditional Gabrielino territory (Bean and Smith 1978: 538). Cahuilla lands begin on the opposite side of the Santa Ana River extending east with Serrano lands to the north. Tragically, knowledge of the Gabrielinos lifeways is lacking. The Gabrieleno could have had contact with the Spanish as early as 1542 when the first Spaniard is recorded on Gabrieleno land. In 1769 the

Spanish returned with the intent to colonize the area and established four mission sites within Gabrieleno territory. Relations between the two groups were poor. The Spanish introduced diseases, forceful assimilation and systematic destruction of tribal lifeways which decimated the population and left the Tribe unrecognizable as an identifiable group by 1900 (Bean and Smith 1978).

What is known is the Gabrielino were one of the most powerful groups in southern California with influence south into Baja California, east into the Channel Islands, north to the San Joaquin Valley and as far east as the Colorado River. They spoke a Takic family language, from the Uto-Aztecan group. Studies of settlement patterns indicate the existence of primary subsistence villages occupied year-round and some seasonal occupation areas near water courses. Gabrieleno material culture include various types of groundstone, wooden cooking implements and dishes, shell spoons, objects beautifully inlaid with shell, steatite carvings, bone tools, paintings, and pottery made with a coiling technique (Bean and Smith 1978).

Post-Contact History

As noted above, in 1769 the Spanish came to the region and established missions in the region including San Gabriel (est. 1771) nearest to the project area in modern day Los Angeles, San Diego (est. 1769), San Luis Rey (est. 1798), and San Juan Capistrano (est. 1776). Soon after arrival, the Spanish enforced mass conversions of Gabrielinos and other native peoples most of whom become laborers forced to work for missions or landowners under Apartheid-like policies. There were some efforts to revolt including a major effort by Toypurina, a chief's daughter in 1785 (Bean and Smith 1978).

In 1833, the missions became secularized under an independent Mexico and much of the land "ranchos" was granted to private owners who took over the cattle industry began under the missions. These land grants included an area of former Mission San Gabriel property which contains the current project area where Antonia Maria Lugo and Juan Bandini established the San Bernardino and Jurupa ranchos in the 1830s (Vickery 1977). They then offered land to a group of settlers from New Mexico to settle on the upper Santa Ana River and act as a buffer against raiders on the trading route from Santa Fe to Los Angeles. These settlers arrived in 1843 and established the sister communities of La Placita on the east side of the Santa Ana River and Agua Mansa on the west side. Agua Mansa is the approximate location of the current project area and is adjacent to the Agua Mansa Pioneer Cemetery. Agua Mansa prospered until a huge flood in 1862 destroyed most of the community leaving only the cemetery, chapel, and adjoining store. The community was rebuilt, but never prospered the same way again (San Bernardino County Museum 2018).

Eventually the project area came to become encompassed by the town of Colton, which was founded in 1875, the same year the Southern Pacific Railway was built heading east to Los Angeles and later incorporated in 1887. Today the City of Colton encompasses approximately 16 square miles and has a quickly growing population of over 52,000 (City of Colton 2008).

Records Research and Literature Review

WHP archaeologist, Karry L. Blake, requested a records search of the APE from the California Historical Resources Information System (CHRIS). The search results were received from the South-Central Coastal Information center on July 31, 2020. This kind of search allows for predictions to be made regarding the occurrence and frequency of archaeological sites in areas that have not been previously identified. Results included reports for nine archaeological surveys and three archaeological resources located within a ¼ mile radius of the project APE (Tables 1 and 2). The surveys conducted nearby include those related to pipleline, sewerline, and other energy-related infrastructure development. Resources include the historic Agua Mansa Cemetery and Agua Mansa Chapel, historic canal segments, and historic powerlines. In addition, General Land Office plats dating to 1856, 1873, and 1889 were reviewed for any pertinent cultural information. While the original townsite of Agua Mansa is visible in the 1856 plat, none of the other plats show any subsequent development in or near the APE.

Table 1: Previous Cultural Resource Investigations within 1 mile of the Project Area

CHRIS ID	Report Title and Reference
SB-00711	*Cultural Resources Evaluation of the Rialto Tank Farm Location and Associated Pipeline and Pump Station Locations, San Bernardino County, California* Chavez 1978a
SB-00712	*Cultural Resources Evaluation of The Four Corners Pipeline Interconnect Facilities, San Bernardino and Riverside Counties, California* Chavez 1978b
SB-00713	*Final Cultural Resources Evaluation for the Naval Petroleum Preserve No. 1 (Elk Hills) to Rialto Crude Oil Pipeline, Kern County, California* Chavez 1978c
SB-00714	*Final Cultural Resources Evaluation for the Rialto Crude Oil Tank Farm to the Four Corners Pipeline, Kern County, California* Chavez 1978d
SB-01287	*Cultural Resources Assessment of the Santa Ana Regional Interceptor Reaches IV-D and IV-E, San Bernardino and Riverside Counties, California* *Lerch 1982*
SB-02214	*Update Report: Archaeological Monitoring at the SAWPA RIX Site, Site 1, Colton (Agua Mansa), San Bernardino County, California.* McKenna 1990
SB-02853	*Cultural Resources Investigation: Inland Feeder Project, Metropolitan Water District of Southern California* Foster et al. 1991
SB-05116	*Cultural Resources Assessment of the Southwest Gas Corporation Pipeline for the High Desert Power Project, San Bernardino County, CA* William Self Associates 1998
SB-07123	*Supplemental Archaeological Survey Report, 66KV Transmission Lines Access Roads, Tehachapi Renewable Transmission Project Segments 7 and 8, Los Angeles and San Bernardino Counties, California* Panich and Holson 2010

Table 2: Previously Recorded Sites within 1 mile of the Project Area

Resource ID	Site Age	Site Type	Site Attributes	Eligibility
SBCM-113	Historic Ca. 1800s to 1960s	Cemetery	Agua Mansa Cemetery	Eligible, State Historic Landmark
SBR-694	Historic ca. 1940	Linear Feature	Irrigation system	Unevaluated
SBR-17229H	Historic ca. 1950s	Linear Feature	Transmission line	Unevaluated

Expected Resource Types

The location of the APE in within an industrial zone of Rialto with existing facilities adjoining the property, a waterline, a well, and a large transmission line along the northern boundary. Very few resources are present within a ¼-mile of the APE as well as in the general area in similar conditions or on similar landforms. Grading, equipment storage, and waste materials disposal have further disturbed. However, the paucity of sites could be due to lack of surveys and there is some possibility of discovering new cultural resources in areas retaining intact soils and less-disturbed landforms. The intense use of the area historically suggests a high likelihood of encountering historic water works, wells, or artifacts associated with the settlement and farming of the area.

It is anticipated that in the event any archaeological resources are discovered in the APE, they will most likely be small late historic artifact concentrations related to farming and ranching, historic-period settlement, or pre-contact artifact scatters related to resource acquisition areas or temporary camps.

Field Methods

Fieldwork was performed by WHP senior archaeologist, Karry L. Blake, on June 17, 2020. The archaeologist was provided with USGS topographic quadrangle maps and high-resolution aerial photographs depicting the APE. In addition, GIS shapefiles of the APE were uploaded to handheld Trimble XH global positioning system (GPS) device used to record the locations of survey transects, roads, and other features encountered during the field investigations. Survey was limited to those areas north of the EZ-Mix facility which will be subject to development. The project area was walked in parallel north-south transects spaced no more than 10 meters apart. Surface visibility averaged roughly 40 percent with areas of up to 80 percent visibility and some as low as 10 percent. No artifacts or cultural features were encountered during the pedestrian survey.

Results

The project APE is heavily disturbed and filled with non-local sediments. Some of the material present on the project surface has eroded from concrete mix debris piles. Waste materials from the E-Z Mix plant and the Angelus Block facility have been used to level the ground surface immediately north of the existing fence line (Figures 4, 7, and 8). This has added fill to the ground surface (Figure 7). Additional disturbances on the property include multiple dirt roads used for accessing the transmission line (Figure 9) and water facilities. Intact surfaces include areas in the northern half of the project area. Modern trash was frequently encountered throughout the APE. No cultural resources were encountered during this survey.

Figure 7 Overview of filling associated with materials disposal from current manufacturing facilities, view to the northwest.

Figure 8 Overview of staging and disposal area, view to the northwest.

Figure 9 Overview of dirt road below transmission line along northern project boundary, view to the west.

Conclusions and Recommendations

Angelus Block is proposing to build additional concrete block manufacturing facilities and associated infrastructure. This property borders the California Historic Landmark, Agua Mansa Cemetery. Cultural resources survey was conducted in compliance with CEQA requirements. No cultural resources were encountered during this work. The Agua Mansa Cemetery is buffered by a sediment berm that extends from the boundary fence and onto Angelus Block property (Figures 2 and` 10). This buffer appears to have been constructed to protect the cemetery grounds and to prevent the inadvertent disturbance of burial features during the development of private property. Development plans, as currently designed, indicate that the protective berm will be enhanced to support an access road but will remain in place around the cemetery fence thus avoiding potential impacts to unidentified buried features. The retaining wall visible in Figure 10 between the berm and the block storage area will be rebuilt into a more substantial structure with a forklift ramp leading to the new facility. Due to the proximity of the historic period cemetery, it is recommended that the Inadvertent Discovery Plan in Appendix A be finalized for the project prior to construction to outline procedures to be followed in the unlikely event any archaeological materials, sites, or human remains are discovered. It is the recommendation of NV5 that the construction of the proposed facilities will have **No Effect** upon any buried cultural resources. NV5 recommends that no further archaeological work is needed, and project development should proceed as planned.

Figure 10 Overview of the berm adjacent to the Agua Mansa Cemetery, view to the southeast.

Development always presents the potential to expose previously undetected subsurface cultural resources during construction. If this should occur, all construction should cease, and a qualified archaeologist should be consulted. The protocols of an Inadvertent Discovery Plan (Appendix A) should be implemented. If human remains are encountered during excavation or other ground disturbing activities, work in and around the remains must halt and the San Bernardino County coroner notified and provisions of the State Health and Safety Code §7050.5.

References Cited

Altschul, Jeffrey H., Martin R. Rose, and Michael K. Lerch

1984 *Man and Settlement in the Upper Santa Ana River Drainage: A Cultural Resources Overview.* Technical Series No. 1. Statistical Research, Tucson.

Bean, Lowell John and Charles R. Smith

1990 Gabrielino. In *California,* edited by Robert F. Heizer, pp. 538-549. Handbook of North American Indians, vol. 8, W.C. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

California Department of Fish and Wildlife

2003 *Atlas of the Biodiversity of California*. California Department of Fish and Game, Biogeographic Data Branch. Sacramento, California.

Chavez, David

1978a *Cultural Resources Evaluation of the Rialto Tank Farm Location and Associated Pipeline and Pump Station Locations, San Bernardino County, California.* David Chavez, Consulting Archaeologist. Submitted to URS Research Company.

1978b *Cultural Resources Evaluation of The Four Corners Pipeline Interconnect Facilities, San Bernardino and Riverside Counties, California.* David Chavez, Consulting Archaeologist. Submitted to URS Research Company.

1978c *Final Cultural Resources Evaluation for the Naval Petroleum Preserve No. 1 (Elk Hills) to Rialto Crude Oil Pipeline, Kern County, California.* David Chavez, Consulting Archaeologist and URS Research Company. Submitted to U. S. Department of Energy Naval Petroleum and Oil Shale Reserves.

1978d *Final Cultural Resources Evaluation for the Rialto Crude Oil Tank Farm to the Four Corners Pipeline, Kern County, California.* David Chavez, Consulting Archaeologist and URS Research Company. Submitted to U. S. Department of Energy Naval Petroleum and Oil Shale Reserves.

Christenson, Lynne E.

1990 The Late Prehistoric Yuman People of San Diego County, California: Their Settlement and Subsistence System. Unpublished Ph.D. dissertation. Department of Anthropology, Arizona State University, Tempe.

City of Colton

2018 Economic Development: Colton History. Electronic document, https://web.archive.org/web/20100327202443/http://www.ci.colton.ca.us/Colton_History_070505.html, accessed June 24, 2020.

Foster, John M., James J. Schmidt, Carmen A. Weber, and Gwendolyn R. Romani

1991 *Cultural Resources Investigation: Inland Feeder Project, Metropolitan Water District of Southern California.* Greenwood and Associates. Submitted to P &7 D Technologies.

Gallegos, Dennis

1985 *A Review and Synthesis of Environmental and Cultural Material for the Batiquitos Lagoon Region*. Casual Papers, San Diego State University.

Griffith, G.E., Omernik, J.M., Smith, D.W., Cook, T.D., Tallyn, E., Moseley, K., and Johnson, C.B.

2011 Ecoregions of California (color poster with map, descriptive text, and photographs): Menlo Park, California.

Lerch, Michael K.

1982 *Cultural Resources Assessment of the Santa Ana Regional Interceptor Reaches IV-D and IV-E, San Bernardino and Riverside Counties, California.* San Bernardino County Museum Association. Submitted to Jones & Stokes Associates, Inc. and the Santa Ana Watershed Project Authority.

McKenna, Jeanette A.

1990 *Update Report: Archaeological Monitoring at the SAWPA RIX Site, Site 1, Colton (Agua Mansa), San Bernardino County, California.*

Moratto, Michael J.

1980 The Pauma Complex in Northern San Diego County: 1978. *Journal of New World Archaeology*3(4):1–39.

Natural Resources Conservation Service (NRCS), USDA

2020 *National Cooperative Soil Survey,* Web Soil Survey. Electronic document, http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx, accessed July 2, 2020.

Panich, Lee, and John Holson

2010 *Supplemental Archaeological Survey Report, 66KV Transmission Lines Access Roads, Tehachapi Renewable Transmission Project Segments 7 and 8, Los Angeles and San Bernardino Counties, California.* Pacific Legacy, Inc. Submitted to the Southern California Edison Company.

San Bernardino County Museum

2018 *The Agua Mansa Pioneer Cemetery*. Electronic document, http://www.sbcounty.gov/museum/branches/agua.htm, accessed May 30, 2020.

Sutton, Mark Q., and Jill K. Gardner

2010 Reconceptualizing the Encinitas Tradition of Southern California. *Pacific Coast Archaeological Society Quarterly 42*(4):1–64.

Vickery, Joyce C.

1977 *Defending Eden: New Mexican Pioneers in Southern California, 1830–1890*. Department of History, University of California, Riverside, and Riverside Museum Press, Riverside.

Warren, Claude N.

1967 The San Dieguito Complex: A Review and Hypothesis. *American Antiquity* 32:233–236.

Warren, Claude, Gretchen Siegler, and Frank Dittner

2008 Paleo-Indian and Early Archaic Periods. In *Prehistoric and Historic Archaeology of Metropolitan San Diego: A Historic Properties Background Study*, pp. 13-107. ASM Affliates. Carlsbad, California.

William Self Associates

1998 *Cultural Resources Assessment of the Southwest Gas Corporation Pipeline for the High Desert Power Project, San Bernardino County, CA.* William Self Associates. Submitted to Resource Management International, Inc.

Appendix A: Archaeological Inadvertent Discovery Plan (IDP)

Angelus Block Manufacturing Facility Construction Project

John Quigley 8/20/2020

How to use this document

What may be encountered
- See Supplementory Information for examples

Discovery Procedures
- Archaeological material, or
- Human Remains Procedures

Confidentiality
- Protected by State and Federal law

Archaeology consists of the physical remains of the activities of people in the past. This IDP should be followed should any archaeological sites, objects, or human remains are found. These are protected under Federal and State laws and their disturbance can result in criminal penalties.

This document pertains to the work of the Contractor, including any and all individuals, organizations, or companies associated with Angelus Block Manufacturing Facility Construction Project.

What may be encountered

Archaeology can be found during any ground-disturbing activity. If encountered all excavation and work in the area MUST STOP. Archaeological objects vary and can include evidence or remnants of historic-era and precontact activities by humans. Archaeological objects can include but are not limited to:

- ***Stone flakes**, **arrowheads**, **stone tools**, **bone or wooden tools**, **baskets**, **beads**.*
- *Historic building materials such as **nails**, **glass**, **metal** such as cans, barrel rings, farm implements, **ceramics**, **bottles**, **marbles**, **beads**.*
- *Layers of **discolored earth** resulting from hearth fire*
- *Structural remains such as **foundations***
- ***Shell** Middens*
- ***Carved or engraved stone** and/or metal **coffin fittings**, **coffin wood***
- ***Human skeletal remains** and/or **bone fragments** which may be whole or fragmented.*

For photographic examples of artifacts, please see Appendix A. (Human remains not included)

If there is an inadvertent discovery of any archaeological objects, see procedures below.

If in doubt call it in.

Discovery Procedures: What to do if you find something

1. *Stop ALL work in the vicinity of the find*
2. *Secure and protect area of inadvertent discovery with 30 meter/100 foot buffer—work may continue outside of this buffer*
3. *Notify Project Manager and Agency Official*
4. *Project Manager will need to contact a professional archaeologist to assess the find.*
5. *If archaeologist determines the find is an archaeological site or object, contact SHPO. If it is determined to not be archaeological, you may continue work.*

Human Remains Procedures

1. *If it is believed the find may be human remains, stop ALL work.*
2. *Secure and protect area of inadvertent discovery with 30 meter/100 foot buffer, then work may continue outside of this buffer with caution.*
3. *Cover remains from view and protect them from damage or exposure, restrict access, and leave in place until directed otherwise.* ***Do not take photographs. Do not speak to the media****.*
4. *Notify:*
    - *Project Manager*
    - *City of Rialto*
    - *San Bernardino County Coroner* ***DO NOT CALL 911***
    - *Office of Historic Preservation (OHP)*
    - *Native American Heritage Commission (NAHC)*
    - *Appropriate Native American Tribes*
5. *If the site is determined not to be a crime scene by the Rialto Police Department and San Bernardino County Coroner, do not move anything! The remains will continue to be secured in place along with any associated funerary objects, and protected from weather, water runoff, and shielded from view.*
6. *Do not resume any work in the buffered area until a plan is developed and carried out between the Coroner, OHP, NAHC, and appropriate Native American Tribes or descendent groups and you are directed that work may proceed.*

Contact Information

- *Project Manager, John Quigley: 818-577-3552*
- *City of Rialto, Edgar Gonzalez: 909-820-2525 Ext. 2139*
- *Contracted Archaeologist: to be identified at project implementation*
- *Rialto Police Department: 909-820-2550*
- *San Bernardino County Coroner, Brian McCormick: 909-387-2978*
- *California Office of Historic Preservation (OHP),*
    - *State Historic Preservation Officer (SHPO), Julianne Polanco: 916-445-7000*
    - *Asst. SHPO/Tribal Liaison, Jenan Saunders: 916-445-7000*
- *NAHC, Mitch Sparks: 503-986-1086*
- *Appropriate Tribes and Descendent Groups (to be updated after OHP consultation)*

Confidentiality

Angelus Block Manufacturing Facility Construction Project and employees shall make their best efforts, in accordance with federal and state law, to ensure that its personnel and contractors keep the discovery confidential. The media, or any third-party member or members of the public are **not** to be contacted or have information regarding the discovery, and any public or media inquiry is to be reported to City of Rialto. Prior to any release, the responsible agencies and Tribes/Descendent Groups shall concur on the amount of information, if any, to be released to the public.

To protect fragile, vulnerable, or threatened sites, the National Historic Preservation Act, as amended (Section 304 [16 U.S.C. 470s-3]), and California State Health and Safety Code, Section 7050.5, and PRC Section

5097.98 establishes that the location of archaeological sites, both on land and underwater, shall be confidential.

Supplementary Information: Visual Reference Guide to Encountering Archaeology

Figure 11: Stone flakes

Figure 12: Stone tool fragments

Figure 13: Cordage

Figure 14: Shell midden

Figure 15: Historic glass artifacts

Figure 16: Historic metal artifacts

Figure 17: Historic building foundations

Figure 18: 18th Century ship

Appendix F

Geotechnical Report

Preliminary Geotechnical Investigation and Percolation Testing, Angelus Block, Co., Proposed Manufacturing Facility, APN 0260-061-67-00 and 0260-061-41-00, Fortuna Way, Rialto Area, San Bernardino County, California.

PN 19042-00
January 20, 2020

KCG KLING Consulting Group, Inc.

KCG KLING Consulting Group, Inc.

January 20, 2020 PN 19042-00

Angelus Block Company, Inc.
C/o Mr. Frank Loni, AIA
GHL Inc., Architecture + Engineering
228 East Badillo Street,
Covina, California 91723

Subject: **Preliminary Geotechnical Investigation and Percolation Testing, Angelus Block Co., Proposed Manufacturing Facility, APN 0260-061-67-00 and 0260-061-41-00, Fortuna Way, Rialto area, San Bernardino County, California**

Dear Mr. Loni:

In accordance with your request and authorization, Kling Consulting Group, Inc. (KCG) has conducted a geotechnical investigation and percolation testing for the proposed project. This report presents the results of our findings from surface and subsurface exploration, geotechnical analyses, and laboratory testing of selected soil samples. Additionally, this report summarizes our conclusions and recommendations relative to the proposed development.

Based on the results of our field exploration, laboratory testing and engineering analysis, it is our opinion that the site is geotechnically feasible for the proposed development, provided the recommendations presented herein are implemented during the design, grading, and construction of the project. This report is also subject to the limitations presented in Section 6.0 of our report and the ASFE (Associated Soil and Foundation Engineers) insert included in Appendix G.

We appreciate this opportunity to be of continued service and to work with you on this project. Should you have any questions regarding this report, please do not hesitate to call.

Respectfully,

KLING CONSULTING GROUP

CERTIFIED ENGINEERING GEOLOGIST JEFFREY P. BLAKE No. EG 2248 Exp. 10/31/21 STATE OF CALIFORNIA

Henry F. Kling
Principal Geotechnical Engineer
G.E. 2205
Expires 3/31/20

REGISTERED PROFESSIONAL ENGINEER HENRY F. KLING No. 2205 GEOTECHNICAL STATE OF CALIFORNIA

Jeffrey P. Blake
Associate Engineering Geologist
C.E.G. 2248
Expires 10/31/21

JPB:HFK:mk

Dist.: (3) Addressee one electronic PDF via email

TABLE OF CONTENTS

TABLE OF CONTENTS
(Continued)

Attachments:

1.0 INTRODUCTION

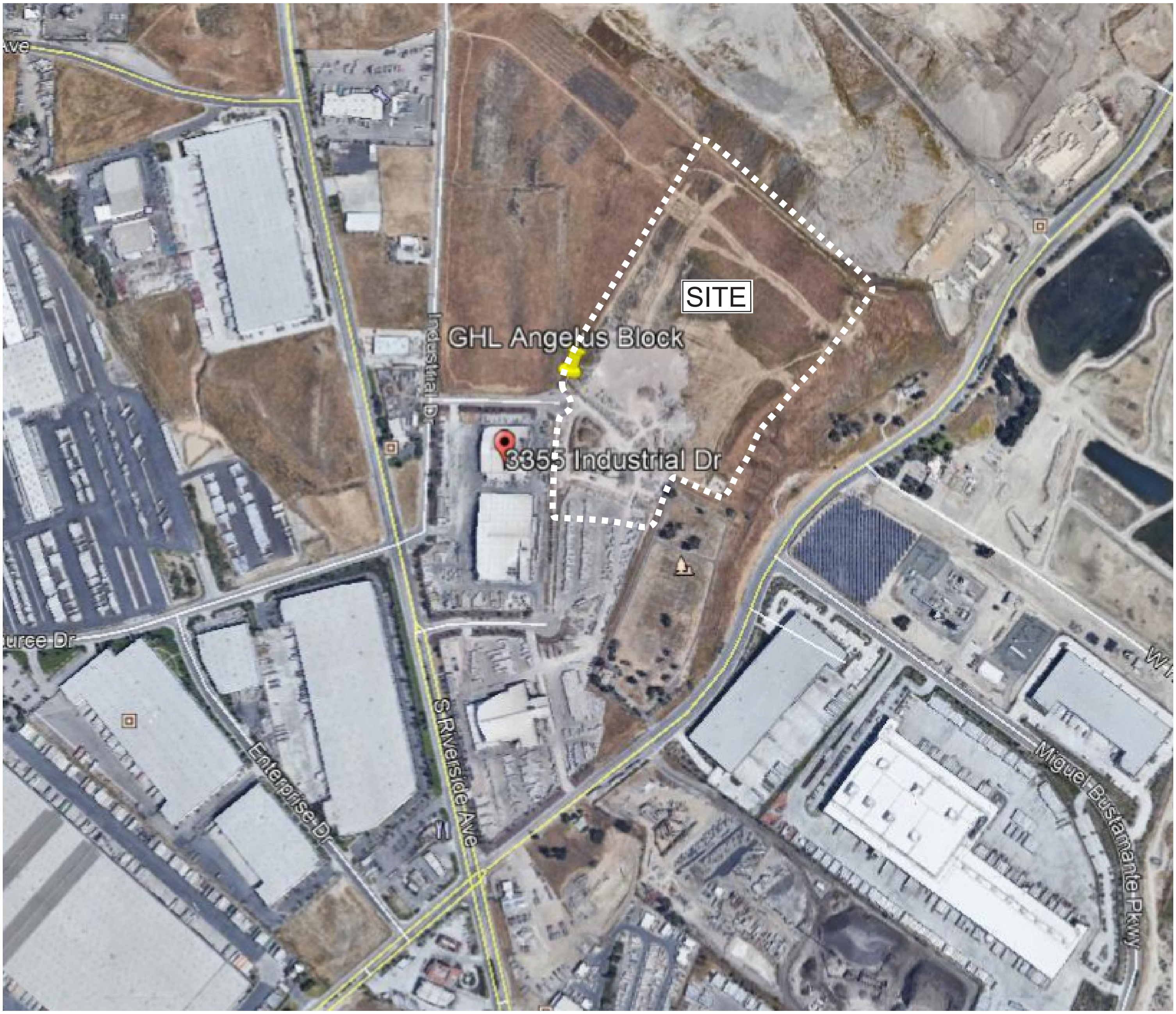
1.1 Purpose and Scope of Work

The purpose of this investigation was to characterize and evaluate the subsurface soils in order to develop recommendations for the proposed development. The scope of work undertaken included the following tasks:

- Compilation and interpretation of available, previously documented geologic and geotechnical data for the property;
- Coordination with Underground Service Alert to mark and identify buried utilities prior to exploration;
- Field reconnaissance of the site and drilling and logging of eighteen (18) hollow stem borings drilled to depths from approximately 5.0 feet to 31.5 feet below the existing ground surface within the proposed development areas. Percolation tests were performed in eight (8) of the borings at depths of approximately 5, 10, and 15 feet. Bulk and drive samples were obtained in the field and delivered to our laboratory for testing and evaluation;
- Laboratory testing was performed on selected soil samples. Laboratory testing included moisture/density determinations, expansion index, soluble sulfate, and direct shear; consolidation and R-Value;
- Engineering analysis to provide recommendations for conventional foundations to support the proposed structures including total and differential settlement, infiltration rates, and seismic design parameters;
- Preparation of this geotechnical investigation report which presents a summary of our field exploration along with recommendations for the proposed development, seismic design parameters, general earthwork guidelines, foundations and pavements.

1.2 Site Location and Description

The project site is located at the eastern terminus of Fortuna Way (Bunting Drive) in the Rialto area of San Bernardino County. Based on a review of Google Earth® online imagery, and the conceptual plans prepared by GHL Inc., provided, the subject site encompasses approximately ±30 acres on two contiguous parcels, identified as APN 0260-061-67-00 and 0260-061-41-00. The majority of the site appears to be vacant but portions appear to be utilized for storage of block materials and crushing or manufacturing operations located in the southwestern part of the subject property. These areas are fenced in and an access gate is located at the end of Fortuna Way. The site is located east of S. Riverside Avenue and Industrial Drive, and just east of the existing terminus of the paved Fortuna Way. A cemetery borders the site to the south, vacant undeveloped land to the north, Fortuna Way and an EZ Mix Building Materials and Supplies Facility along Industrial Drive to the west, and vacant land and Agua Mansa Road to the east. **Figure 1** illustrates the geographic location of the project site.



N

Not to Scale

KCG KLING Consulting Group, Inc.	**Site Location Map** Proposed Manufacturing Facility, Rialto, California. 92316	**Figure:** **1** **PN:** **19042-00** **Date:** **January 20, 20**

1.3 Proposed Improvements

It is our understanding that the site will be developed for a new manufacturing facility along with associated improvements. We understand that the proposed new facilities will include the construction of a manufacturing building, office building, wherehouse, mechanic shop, metal canopy, and paved parking and drive areas. The buildings will be one to two stories, and range from 6,000 square feet to 17,664 square feet. Two manufacturing plant facilities are planned and will be 47,376 square feet. The metal canopy will be 15,050 square feet. Underground utilities and stormwater facilities are also planned. It is assumed the proposed buildings would consist of steel or wood-framed construction supported by conventional spread footings and slab on grade, with asphalt concrete, concrete pavement and interlocking concrete pavers, for parking stalls and driveways.

2.0 GEOLOGIC CONDITIONS

2.1 Field Exploration

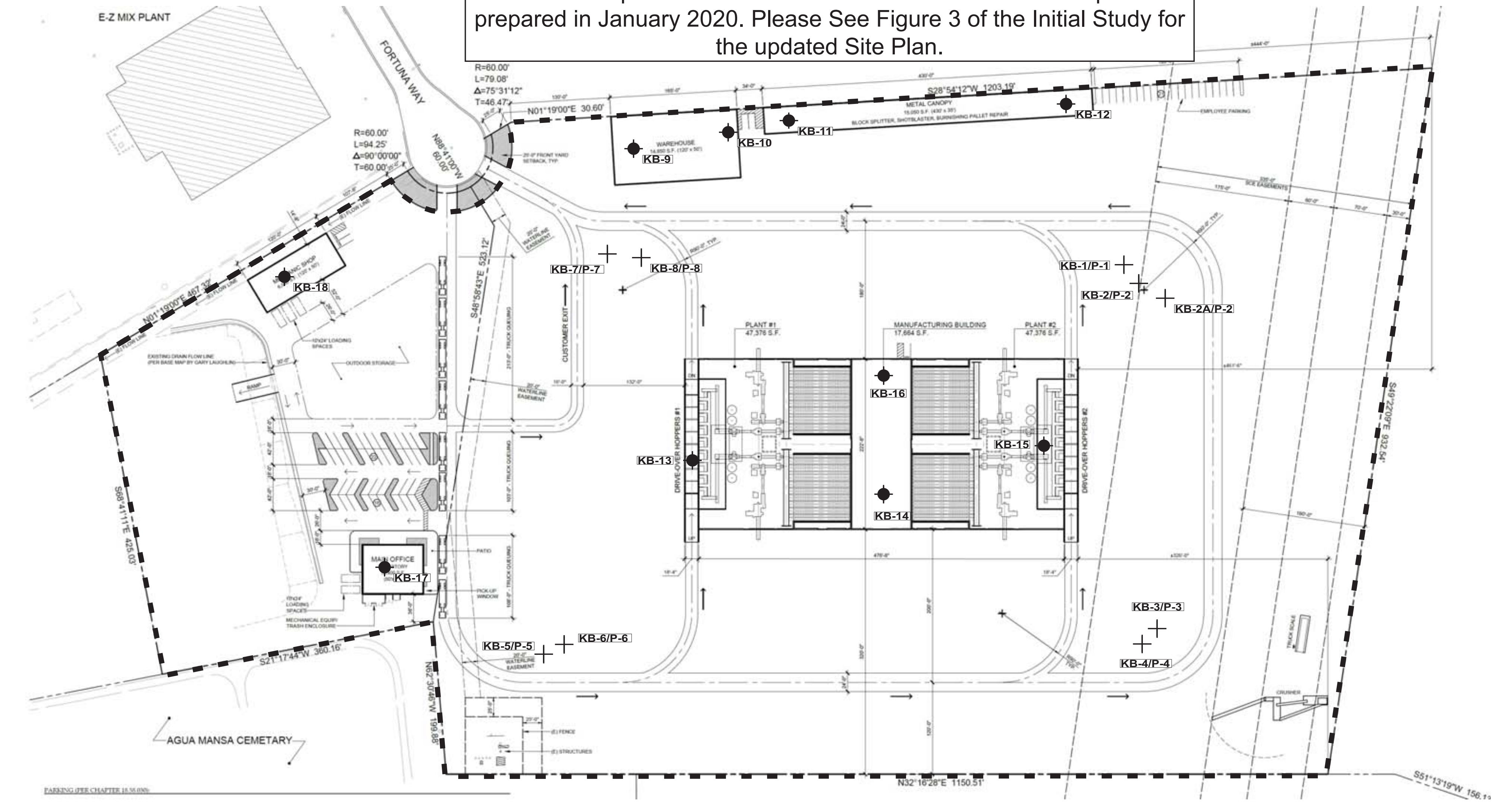
On December 17, and December 18, 2019, eighteen (18) hollow stem borings were drilled to depths ranging from approximately 5.0 feet to 31.5 feet below the existing ground surface within the proposed development areas. Percolation tests were performed in eight (8) of the borings at depths of approximately 5, 10 and 15 feet. Bulk and drive samples were obtained in the field and delivered to our laboratory for testing and evaluation. The locations of the borings are illustrated on **Figure 2**. Full descriptions of the materials encountered are presented in the boring logs in **Appendix B.**

2.2 Regional Geologic Setting and Site Specific Geology

The subject project area is within the southwestern portion of the San Bernardino South Quadrangle in the Rialto area, San Bernardino County, California. The alluvial materials encountered in this portion of the quadrangle are mapped as Quaternary aged Old Eolian and Dune deposits (Qoe) in the vicinity of the site and Old Alluvial Fan deposits (Qoa) to the west of the site that are generally dense to very dense sand and silty sand with minor gravels.

Locally, the materials encountered during our subsurface exploration consisted primarily of Old Eolian Dune Deposits and were comprised of clayey sands, silty sands and silty sands with gravel which were generally medium dense to very dense and damp to moist.

Note: The Proposed Site Plan has been revised since this report was prepared in January 2020. Please See Figure 3 of the Initial Study for the updated Site Plan.



Legend

- ● KB-1 — Approximate Location of KCG Boring
- + KB-1/P-1 — Approximate Location of KCG Boring/ Percolation Test Hole

Not to Scale

KCG KLING Consulting Group, Inc.

Boring Test Location Map
Angelus Block Co., Inc.,
Proposed Manufacturing Facility, Rialto, Ca. 92316

Figure:	2
PN:	19042-00
Date:	January 20, 2020

2.3 Groundwater

Groundwater was not encountered during drilling to the maximum depth explored of 31.5 feet. Groundwater is anticipated to be greater than 100 feet below the ground surface. The highest recorded groundwater level at a nearby monitoring well located within approximately 1 mile to the west of the subject site, as reported by the California Department of Water Resources, is approximately 112 feet to 123 feet below the ground surface between 1996 and 2018. (Reference 1-5).

2.4 California Building Code Seismic Design Parameters

A geologic hazard likely to affect the project is ground-shaking as a result of movement along an active fault zone in the vicinity of the subject property. Presented below are the site seismic parameters utilizing geologic, seismic and geotechnical data gathered for the site. All structures should be designed for earthquake induced strong ground motions in accordance with the 2019 CBC procedures utilizing the following parameters:

Table 2.4.1 - Seismic Design Parameters

Site Class (Soil Profile)	C
Latitude	34.0445
Longitude	-117.3641
Short Period Spectral Acceleration, S_s:	1.688
1-Second Period Spectral Acceleration, S_1:	0.658
Site Coefficient, F_a:	1.2
Site Coefficient, F_v:	1.4
Maximum Considered Earthquake Spectral Response Acceleration, S_{MS}:	2.025
Maximum Considered Earthquake Spectral Response Acceleration, S_{M1}:	0.922
Design Spectral Response Acceleration, S_{DS}:	1.35
Design Spectral Response Acceleration, S_{D1}:	0.615
Site modified peak ground acceleration PGA_M	0.857
Seismic Design Category	D

2.5 Faulting and Surface Rupture

The subject property is located within an area of California known to contain a number of active and potentially active faults. The property is not located within a State of California Earthquake Fault Zone (Jennings and Bryant, 2010; Hart and Bryant, 1997). No active faults are known to cross the site. The distances of the closest major active faults from the property were generated from information provided on the USGS online resource (USGS, 2008, National Seismic Hazards Maps, Source Parameters,), with the approximate center of the site being at latitude 34.0445°N and longitude 117.3641°W. The San Jacinto Fault Zone- San Bernardino Valley Section is located approximately 4 miles from the site, San Jacinto Fault Zone- San Jacinto Valley Section is located approximately 7 miles from the site, and the San Andreas Fault Zone approximately 10 miles from the site. It is our opinion that the potential for surface fault rupture at the property is low.

2.6 Liquefaction Potential

Based on our review of published geologic data, subsurface data, laboratory testing, the lack of a shallow static groundwater table, and the overall dense nature of the underlying onsite soils, it is our opinion that the site is not susceptible to liquefaction. A seismic hazard zone for the subject site area has not been established by the state of California.

2.6.1 Seismically Induced Dry Settlement

The materials underlying the site are overall relatively dense and the dry settlement potential is considered low.

2.6.2 Lateral Spreading

The potential for lateral spreading is unlikely based on information which indicates that the site is not likely to be liquefiable as discussed above.

3.0 GEOTECHNICAL ENGINEERING CONSIDERATIONS

3.1 Expansive Soil Characteristics

Based on tests performed on representative samples of near-surface soils, the sample tested exhibited an expansion index of 0 and 45, which is considered a very low to low expansion potential.

3.2 Soluble Sulfate and Chloride Exposure

The soils tested during this investigation indicated a class "S0" sulfate with a soluble sulfate content ranging from 3 ppm or 0.0003% to 93 ppm or 0.0093%.

3.3 Earthwork Shrinkage and Subsidence

Based on our field and laboratory density tests and observations, the following estimate of shrinkage and subsidence factors of the upper alluvial materials to be utilized as on-site compacted fill soils are presented for design consideration.

Shrinkage Factor - 10% to 15%
Subsidence Factor - 0.10 feet

Although the above values are only approximate, they represent our best estimate of shrinkage and lost yardage which would likely occur during re-grading.

3.4 Percolation Testing

Percolation tests were performed in general accordance with the San Bernardino County Technical Guidance Document for Water Quality Management Plans (Reference 7). Test borings were drilled using a hollow stem auger with a diameter of 6 inches to depths of approximately 5 to 15 feet at eight locations across the site. Prior to saturating the percolation holes, four-inch slotted pipe was installed into the holes. Filter pack consisting of ¾-inch graded gravel was placed around the pipe. The holes were saturated by filling them with at least 12 inches of water above the bottom of the holes. Following completion of pre-saturation, the testing commenced the same day.

3.5 Preliminary Percolation Test Results

The rates obtained during the percolation testing were converted to infiltration rates using a reduction factor (porchet method) as presented in Reference 7. The percolation test results calculated using the recommended procedure in Reference 7 indicated that the onsite soil has estimated infiltration rates ranging from 0.26 to 1.98 inches per hour. *No additional correction factors have been applied to the infiltration rates besides a test-specific reduction factor*. The percolation test results are tabulated and presented in **Appendix D** and the results are provided below:

Test Hole No.	Test Hole Depth (ft.)	Infiltration Rate (inch/hr)
KB-1/P-1	6.5	1.41
KB-2A/P-2A	10	0.26
KB-3/P-3	5	0.70
KB-4/P-4	15	0.45
KB-5/P-5	6.5	0.57
KB-6/P-6	16.5	1.60
KB-7/P-7	5	1.98
KB-8/P-8	15	1.43

4.0 CONCLUSIONS

The following conclusions are based upon our analysis and review of geotechnical data. It is our opinion that the proposed site improvements are geotechnically feasible, provided that the recommendations of this report are followed during future site development and design.

- For conventional spread footings that are to be used to support the proposed buildings, remedial earthwork is recommended consisting of the removal of the upper potentially compressible soils to provide a uniform fill beneath the foundations and reduce static and differential settlement. Recommendations for over excavation below proposed building foundations are discussed in Section 5.3;

- No active faults are known to exist at the site and the risk of surface fault rupture is considered to be very low. However, the project site lies within a region of historical seismicity and will likely be subject to seismic shaking in the future;

- The potential for liquefaction and lateral spreading to occur within the site is unlikely due to the lack of a shallow static groundwater table and the overall dense nature of the underlying on-site soils;

- The potential for seismically induced settlement (unsaturated or dry sand settlement) to occur at the site is considered to be low. The materials underlying the site are overall relatively dense to very dense;

- Soils underlying the subject site are not considered to be susceptible to hydrocollapse;

- Groundwater is anticipated to be at depths greater than 50 feet, therefore groundwater is considered to be at a depth such that it should not pose a construction problem for the proposed development;

- Laboratory testing indicates that the upper near surface soils possess a “very low to low” expansion potential.

- Based on near-surface soil test results, the on-site soil indicated a soluble sulfate content that is considered “Class S0” which is negligible to sulfate exposure as per the 2014 ACI Concrete Manual of Practice as indicated in Section 19, Table 3.1.1;

- The shallow percolation tests at 5 to 6.5 feet have an estimated infiltration rate of 0.57 inches per hour to 1.98 inches per hour, and the deep percolation tests at depths of 10 to 16.5 feet have estimated infiltration rates of 0.26 inches per hour to 1.60 inches per hour.

5.0 RECOMMENDATIONS

Recommendations presented herein are preliminary and subject to revision if new information becomes available. The recommendations are preliminary and also subject to supplemental field exploration and verification of underlying soils conditions after demolition of existing structures and improvements prior to construction.

5.1 Earthwork Specifications

All grading should be performed in accordance with the General Earthwork and Grading Specifications presented in Appendix E, unless specifically revised or amended below. Grading should also conform to all applicable governing agency requirements. Prior to commencement of grading operations, all vegetation, organic topsoil, and man-made structures (i.e., tanks, pipes, fences, etc.) should be cleared and disposed of off-site. Any undocumented fill or backfill encountered should be removed and recompacted. All areas receiving fill should be scarified to 6 inches and/or over-excavated, moisture-conditioned to between optimum moisture and two to four percent above optimum moisture content, and re-compacted to a minimum of 90 percent relative compaction as determined by ASTM D1557. Soil material excavated from the site should be adequate for re-use as compacted fill provided it is free of trash, vegetation, and other deleterious material. All earthwork and grading operations should be performed under the observation and testing of the geotechnical consultant of record.

5.2 Remedial Earthwork and Over-Excavation

Proposed Structural Areas

The upper three (3) feet of the soils underlying the site are considered potentially compressible with additional fill or structural loads. In order to reduce the potential for settlement and differential settlement, and maintain a uniform fill blanket beneath the bottom of the foundations, we recommend the building pad areas be over-excavated to provide and maintain a minimum thickness of at least three (3) feet of fill below finish grade elevations, or a minimum of two (2) feet below proposed foundations, *whichever is deeper*. The over-excavation should be extended laterally a minimum of five (5) feet beyond the proposed building footprint and/or foundations or equal to the depth of the over-excavation, whichever is deeper. Footings should be underlain by a minimum of two feet of engineered fill below the bottom of footings.

Proposed Pavement and Flatwork Areas

In areas outside of proposed structural areas that would support pavement and flatwork, the exposed subgrade soils should be processed and re-compacted to a depth of 12-inches. If soils are disturbed during removal of existing improvements, the disturbed soil should be removed and replaced with compacted fill. After removals are made, exposed soils should be scarified to a depth of 6-inches, brought to near optimum moisture content, and re-compacted.

5.3 Processing of Natural Soils and Fill Placement

Processing of in-place soils exposed after clearing, grubbing and removal of unsuitable material and prior to placing fill should include the following items of work:

Scarification of the materials exposed after remedial removals should be accomplished to a depth of at least 6 inches or as dictated by actual soil conditions encountered;

The scarified soils should be brought to 2 to 4 percent above optimum moisture content by watering or drying, as required;

Compaction of the processed soils to at least 90 percent of the laboratory maximum dry density, prior to placing fill.

Fill should be placed in relatively thin (6 to 8-inch) uniform lifts; moisture conditioned to 2 to 4 percent above optimum moisture content and compacted to at least 90 percent relative compaction based on ASTM D 1557. Actual lift thickness would depend on soil type and compaction equipment being used.

5.4 Conventional Foundations

All foundation recommendations are considered minimum requirements that may be superseded by more stringent requirements from the architect, structural engineer, or governing agencies.

The following geotechnical design parameters are provided for the design of proposed foundations for the proposed one to two-story building. The proposed building may be supported by continuous and square pad footings utilizing an allowable bearing pressure of 2000 pounds per square foot. The width of the continuous footings should be a minimum of 15 inches and embedded to a minimum depth of 18 inches below the lowest adjacent grade. For square pad footings, it is recommended that the width be at least 24 inches embedded a minimum of 18 inches below the lowest adjacent grade. Bearing pressures may be increased by 250 pounds per square foot per additional foot of width or depth to a maximum allowable bearing pressure of 3000 pounds per square foot. A coefficient of friction of 0.40 may be used, along with a passive lateral resistance of 250 pounds per square foot per foot of embedment. Footings should bear on at least two feet of compacted fill.

If normal code requirements are used for seismic design, the allowable bearing value and coefficient of friction may be increased by 1/3 for short duration loads, such as the effect of wind or seismic forces.

If any utility lines are within a 1:1 (horizontal: vertical) projection from the bottom of a footing, they may be within the influence zone of the proposed footing load. If this condition exists, the proposed footing should be deepened so that the utility is outside the zone of influence; the utility line could also be relocated or encased with concrete slurry. These conditions should be evaluated on a case by case basis.

5.5 Slab-On-Grade

These recommendations are considered to be minimum requirements that may be superseded by more stringent requirements from the architect, structural engineer, or governing agencies.

Concrete slabs should be at least 4 inches in thickness underlain by a minimum 4-inch capillary break using ½-inch open graded gravel or other material approved by the geotechnical engineer. Actual slab thickness and reinforcement should be determined by the structural engineer based on structural loads and soil interaction. Our recommendations should be superseded by the recommendations of the structural engineer or architect.

Subgrade soils should be placed wet of the optimum moisture content and moisture should be maintained until placement of the concrete slab. Additional testing should be performed at completion of precise grading to verify our recommendations.

The slab should be underlain by a minimum two inch layer of sand; with a sand equivalent of 30 or greater. The sand layer should be underlain by a 15-mil Stego Wrap vapor retarder or equivalent product with a permeance rate of 0.012 perms and a puncture resistance of Class “A” or “B” in accordance with ASTM E 1745-97. As per the manufacturer’s recommendations all seams should overlap a minimum of 6 inches and should be sealed in accordance with the specifications provided by the vapor retarder manufacturer. All penetrations should be sealed using a combination of Stego Wrap, Stego Tape and/or Stego Mastic or approved equivalent product. The vapor retarder should be lapped downward a minimum of 12 inches where the vapor retarder encounters an interior footing or exterior thickened edge or footing. The vapor retarder should be placed on top of the sand layer if the sand is expected to become wet prior to pouring of concrete. If the sand can be kept dry prior to pouring concrete, the vapor retarder should be placed under the sand layer. The water cement ratio should be a minimum of 0.45 for all concrete within the structure that will come in contact with the on-site soil.

If moisture sensitive floor coverings are utilized, interior concrete slabs should be designed and constructed in accordance with the applicable floor covering manufacturer’s specifications.

Slab subgrade soil should be pre-saturated to at least optimum moisture content to a depth of at least 12 inches below the sand layer.

5.6 Retaining Walls

General guidelines are provided below for low retaining walls up to ten feet in retained height.

For preliminary purposes, retaining walls should be designed to resist an equivalent fluid pressure of 40 pounds per cubic foot for level backfill and 55 pounds per cubic foot for 2:1 sloping backfill. Backfill materials could consist of onsite granular material with S.E. $\geq$ 30 (or as approved by the Geotechnical Consultant) and drainage systems should be installed as shown on retaining wall details in **Appendix E.** Please note that drainage recommendations are provided only as a means to create a drained condition behind proposed retaining walls. Surface drains should not be connected to retaining wall sub-drainage. These drains are not intended as a means of waterproofing. If moisture or salt deposition is not desired, or if stone facing, stucco, or paint is to be applied to the wall outer surface, the wall should be provided with suitable waterproofing. The waterproofing system for the wall should be designed by a qualified waterproofing consultant. Any waterproofing or drainage system damaged by soil placement and compaction efforts should be repaired prior to completion of backfilling.

The seismic lateral earth pressure for walls retaining *more than six feet* of soil under level backfill conditions may be assumed to be an additional 15 pcf for active and at-rest conditions. The seismic pressure should be added to the triangular earth pressure from static earth pressure, with zero pressure at the top and maximum at the base.

Foundations for proposed retaining and perimeter (non-retaining) walls which are to be founded into compacted fill materials may be designed utilizing an allowable bearing pressure as presented above in Section 5.5 for conventional foundations.

5.7 Concrete Flatwork

Laboratory testing of surficial soils revealed that the upper on-site soil materials present has “very low” to “low” expansion potential. This corresponds to “low-expansive” as per the current CBC. **Appendix F** contains a table listing our hardscape recommendations for varying degrees of expansive soils. This table should be preliminarily followed for “low” expansion potential for Expansion Index (E.I.) = 21 to 50.

5.8 Sulfate Potential

Based on the soluble sulfate test results the on-site soils possess a sulfate exposure that is considered “Class S0”. Concrete should be designed in accordance with ACI 318, Section 19 Table 3.1.1, utilizing “Class S0” sulfate exposure.

5.9 Corrosion Potential

Buried metals in contact with on-site soils should be encased, sleeved, or wrapped with a suitable dielectric material to isolate them from the on-site soils. Alternatively, plastic piping may also be used. Polyethylene sleeving should be utilized at a minimum to protect copper plumbing pipe.

For more specific recommendations regarding soil corrosivity, it is recommended that a qualified corrosion consultant be retained to provide more specific recommendations regarding corrosion protection.

5.10 Settlement

Static settlement of proposed foundations is not expected to exceed one (1) inch for total and one half (0.5) inch differential over 50 horizontal feet, provided the minimum over-excavation of two feet below the bottom of proposed footings is performed. It may be prudent to assume a lesser horizontal distance should adjacent footings be substantially different in size.

5.11 Pavement Design

Pavement section design is provided below based on near surface soil conditions encountered during our investigation and assumed traffic loading.

5.11.1 Asphalt Concrete Pavement

R-value test results performed indicated an R-Value of 64. The upper on-site subgrade soils were classified as silty sands. To allow for soil variability, we are assuming an R-Value of 40 for preliminary design purposes.

Based on an R-value of 40, the parameters below are provided for preliminary design purposes. Pavement sections were calculated for traffic indices of 4.0 and 5.5, which are commonly used for parking stalls and drive aisles subject to passenger vehicles, respectively. However, the selection of actual traffic index should be the purview of the project civil or traffic engineer.

Pavement Section Design

Location	R-Value	Traffic Index	Multiple Layered	
			Asphalt Concrete (inches)	Aggregate Base* (inches)
Parking Stall	40	4.0	3.0	4.0
Drive Aisles	40	5.5	3.0	5.0
Heavy Truck Drive Aisles	40	6.5	4.0	6.0

*Aggregate base material should consist of Class 2 aggregate base materials or Crushed Miscellaneous Base (CMB).

The upper 12 inches of the subgrade soils should be compacted to at least 90 percent of the laboratory maximum dry density (ASTM D1557). All base materials should be compacted to at least 95 percent of the laboratory maximum dry density (ASTM D1557).

5.11.2 Portland Cement Concrete Pavement

For preliminary design of concrete pavement, it is recommended that a concrete pavement section consisting of 6-inches of concrete underlain by at least 4-inches of either Class 2 or crushed miscellaneous base be used for preliminary design. Concrete Compressive strength should be 4000 psi or greater. Aggregate base material should be compacted to a minimum of 95 percent relative compaction as per ASTM D1557. Subgrade soil should be compacted to at least 90 percent of the laboratory maximum dry density in accordance with ASTM D1557. If concrete crack control is desired, the slabs should be minimally reinforced with No. 4 rebar, placed every 24 inches on center, both ways. A 10-foot square or less grid system should be used in the construction of continuous sections of concrete pavement or as recommended by the structural engineer.

For trash enclosures, concrete pavement should consist of a minimum 8-inch thick concrete slab placed over a minimum of 6-inches of either Class 2 or crushed miscellaneous base material, compacted to 95 percent relative compaction. Concrete should have a minimum strength of 4000 psi and be reinforced with a minimum of No. 4 bars placed at 24 inches on center, in each direction, positively supported (with concrete chairs or other devices) at mid-height in the slab. Crack control joints should be placed at a 10-foot maximum spacing in each direction in the slab or as recommended by the structural engineer. Concrete mix design should incorporate the recommendations presented in the slab on grade section of this report for improved geotechnical performance.

5.11.3 Interlocking Concrete Pavers

The following recommendations are provided for the proposed interlocking concrete pavers.

<u>Pedestrian Areas</u>

A minimum of four inches of aggregate base material compacted to 95 percent relative compaction should underlie the interlocking pavers and one inch or less of paver bedding sand.

Perimeter pavers that are unsupported laterally should be set in concrete embedded a minimum of 12 inches below the lowest adjacent grade.

Vehicular (Driveway) Areas

It is our understanding that interlocking pavers are proposed within the proposed site improvements area. Due to aniticpated truck loading in this area a 5-inch concrete reinforced sub-slab should underlie the interlocking pavers and bedding sand to provide uniform, structural support. Six inches of aggregate base material compacted to 95 percent relative compaction should underlie the sub-slab. Minimum reinforcement of the sub-slab should consist of No. 4 rebar at 24 inches on center, each way. The actual reinforcement design should be provided by the structural engineer.

Drainage for the bedding sand should be provided by installing 1-inch diameter (or as approved by the geotechnical consultant) PVC pipes through the concrete sub-slab which terminate within the underlying base section. These drainage pipes should be installed in localized low spots and on a periodic basis, typically every six to eight feet and should be filled with free draining sand possessing a Sand Equivalent (SE) $\geq$ 30.

The concrete design mix should have a minimum compressive strength of 3,000 pounds per square inch (psi).

Interlocking Concrete Pavers General Notes

1. Interlocking Pavers should be placed such that the proper “lip” (if required) is established at gutter interface.

2. Bedding sand should be one-inch or less in thickness and should consist of angular (crushed) type sand.

3. Soil subgrade materials should be compacted to at least 90 percent relative compaction.

4. Aggregate base materials should be compacted to at least 95 percent relative compaction.

5.12 Temporary Excavations

The following recommendations are presented in the event site development requires excavation. We anticipate the onsite soils can be excavated using conventional heavy duty earthmoving equipment in good condition. Shoring systems, if used, may yield during excavation causing adjacent facilities and improvements to settle slightly. The magnitude of shoring movements and the resulting settlements are difficult to estimate because they depend on many factors, including the method of installation and the contractor's skill with installing the shoring system. Lateral deflections for a properly designed and constructed shoring system would likely be within ordinarily accepted limits of approximately 1-inch. A monitoring program should be established to evaluate the effects of shoring construction on other facilities.

Provided the excavations are above groundwater, temporary excavations and trench walls to a depth of four feet may be made vertically without shoring, subject to verification of safety by the contractor. Deeper excavations should be no steeper than 1.5:1 (horizontal to vertical) or braced or shored in accordance with CAL OSHA standards and guidelines. The contractor is assumed responsible for maintaining safety at the jobsite. All excavation work should be in compliance with current CAL OSHA standards. Under no circumstances should excavations be made deeper than four feet or below groundwater without shoring, bracing or laying-back, in accordance with CAL OSHA standards and guidelines. No surcharge loads should be allowed within five feet from the top of the cuts.

Existing utility lines, roadways and other easements/right-of-ways may be impacted by the temporary excavations may require shoring to obtain the full depth of the excavation.

5.13 Surface Drainage

Surface runoff from natural and graded areas should be controlled and water infiltration into the subsurface should be minimized whenever possible. Positive drainage should be maintained away from any building or structure or graded slope face and directed to suitable areas via non-erosive devises, as designed by the project civil engineer. For drainage over a soil area immediately adjacent to structures, i.e., within 10 feet horizontally or as determined during Precise Grading, a minimum of 5 percent gradient should be maintained. Pad drainage of at least 2 percent should be maintained over any soil areas if applicable. Impervious surfaces within 10 feet of a building foundation should be sloped a minimum of 2 percent away from the building. All drainage should be in accordance with Section 1804.4 of the 2019 California Building Code.

5.14 Plan Review

The geotechnical consultant should review the grading plans and comment on the anticipated effects of any major changes from the conceptual site plan used in this report. Additionally, the geotechnical consultant should review the foundation and retaining wall plans when they become available.

6.0 LIMITATIONS

Geotechnical services are provided by Kling Consulting Group, Inc. in accordance with generally accepted professional engineering and geologic practice in the area where these services are to be rendered. Client acknowledges that the present standard in the engineering and geologic and environmental profession does not include a guarantee of perfection and, except as expressly set forth in the Conditions above, no warranty, expressed or implied, is extended by KCG.

Geotechnical reports are based on the project description and proposed scope of work as described in the proposal. Our conclusions and recommendations are based on the results of the field, laboratory, and office studies, combined with an interpolation and extrapolation of soil conditions as described in the report. The results reflect our geotechnical interpretation of the limited direct evidence obtained. Our conclusions and recommendations are made contingent upon the opportunity for KCG to continue to provide geotechnical services beyond the scope in the proposal to include all geotechnical services. If parties other than KCG are engaged to provide such services, they must be notified that they will be required to assume complete responsibility for the geotechnical work of the project by concurring with the recommendations in our report or by providing alternate recommendations.

It is the readers' responsibility to verify the correct interpretation and intention of the recommendations presented herein. KCG assumes no responsibility for misunderstandings or improper interpretations that result in unsatisfactory or unsafe work products. It is the reader's further responsibility to acquire copies of any supplemental reports, addenda, or responses to public agency reviews that may supersede recommendations in this report.

Kling Consulting Group, Inc. appreciates this opportunity to be of service. Should you have any questions regarding our report, please do not hesitate to call our office.

APPENDIX A

REFERENCES

APPENDIX A

REFERENCES

1. American Concrete Institute, 2014, Building Code Requirements for Structural Concrete (ACI 318-14) and Commentary (ACI 318R-14).

2. American Society for Testing and Materials (ASTM), 2018, Annual Book of ASTM Standards, Volume 04.08, Construction: Soil and Rock (I), Standards D 420 - D 5876.

3. California Building Standards Commission, 2019, California Building Code, Volume 2

4. California Division of Mines and Geology (CDMG), 2000, California Department of Conservation, Digital Images of Official Maps of Alquist-Priolo Earthquake Fault Zones of California, Southern Region, DMG CD 2000-003.

5. California Department of Water Resources Groundwater Level Data, accessed January, 2020 http://wdl.water.ca.gov/waterdatalibrary/groundwater/hydrographs/

6. California Geologic Survey (CGS), Compilation of Quaternary Surficial Deposits: https://maps.conservation.ca.gov/cgs/qsd/app/, Accessed January, 2020.

7. County of San Bernardino, "Technical Guidance Document for Water Quality Management Plans", Appendix D, Section VII, Infiltration Rate Protocol and Factor of Safety Recommendations, Orange County TGD Appendices, dated May 19, 2011, TGD dated June 7, 2013, Effective September 19, 2013.

8. Jennings, C.W., and Bryant, W.A., (Jennings and Bryant) 2010, Fault Activity Map of California and Adjacent Areas: California Geologic Survey, Map Sheet No. 6, scale 1:750,000.

9. Hart, E.W., and Bryant, W.A. (Hart and Bryant), 1997, Fault-Rupture Hazard Zones in California: California Department of Conservation, Division of Mines and Geology, Special Publication 42.

10. Structural Engineers Association of California (SEAC)/Office of Statewide Health Planning and Development OSHPD: Seismic Design Maps: https://oshpd.ca.gov/seismic maps.org, accessed January, 2019.

APPENDIX A

REFERENCES
(CONTINUED)

11. USGS, Earthquakes Hazard Program, National Seismic Hazards Maps, Source Parameters,https://earthquake.usgs.gov/cfusion/hazfaults_2008_search/query_main.cfm January, 2019.

APPENDIX B

BORING LOGS

LOG OF EXPLORATORY BORING

Project:	**Angelus Block Rialto**	Boring No.:	**KB-1**
Project Number:	**19042-00**	Driller:	**Calpac**
Date Drilled:	**12/17/19**	Drill Type:	**Hollow Stem**
Logged By:	**WAP**	Hammer Wt. / Drop:	**140lb / 30in**
		Ground Elev. [ft]:	**---**

Legend: Standard Split Spoon; Shelby Tube; Water Level ATD; California; Bulk Sample; Static Water Table

Depth [ft]	Graphic Log	Sample Type	Blows/6"	Moisture Content [%]	Dry Density, [pcf]	SOIL DESCRIPTION and CLASSIFICATION (USCS)	Pocket Pen. [tsf]	Lab Tests	Remarks
						@ **Surface - TOPSOIL**			
						Old Eolian and Dune Deposits (Qa): @ **0.5 feet - Silty SAND (SM)** olive-brown, fine-grained, damp to moist.			
		California	10 16 19	5	111	@ **2.5 feet - Silty SAND (SM):** yellow-brown, fine-grained, damp, medium dense.			
5		California	8 12 20	4	116	@ **5.0 feet - SAME:** trace coarse grains.			

Total Depth: 6.5 feet.
No groundwater encountered.
No caving.
Boring also used for Percolation Testing.
Hole backfilled on 12/17/2019.

HS BA TP 19042-00 ANGELUS BLOCK RIALTO.GPJ Kling Consulting Group, Inc. 1/14/20

KCG KLING Consulting Group, Inc.

LOG OF EXPLORATORY BORING

Project:	**Angelus Block Rialto**	Boring No.:	**KB-2**
Project Number:	**19042-00**	Driller:	**Calpac**
Date Drilled:	**12/17/19**	Drill Type:	**Hollow Stem**
Logged By:	**WAP**	Hammer Wt. / Drop:	**140lb / 30in**
		Ground Elev. [ft]:	**---**

Legend: Standard Split Spoon; Shelby Tube; Water Level ATD; California; Bulk Sample; Static Water Table

Depth [ft]	Graphic Log	Sample Type	Blows/6"	Moisture Content [%]	Dry Density, [pcf]	SOIL DESCRIPTION and CLASSIFICATION (USCS)	Pocket Pen. [tsf]	Lab Tests	Remarks
						@ Surface - **TOPSOIL**			
						Old Eolian and Dune Deposits (Qa): @ **0.5 feet - Silty SAND (SM)** olive-brown, fine-grained, damp to moist.			
		California	10 16 16	5	110	@ **2.5 feet - Silty SAND (SM):** yellow-brown, fine-grained, damp, medium dense.			
5		California	9 10 18	3	116	@ **5.0 feet - SAME:**			
10		California	9 14 21			@ **10.0 feet - NO RECOVERY:**			
15		Standard Split Spoon	4 14 16			@ **15.0 feet - Silty SAND (SM):** olive-brown, fine to coarse-grained with trace gravels, damp, medium dense.			

Total Depth: 16.5 feet.
No groundwater encountered.
Caving at 13.0 to 15.0 feet.
Hole backfilled on 12/17/2019.

HS BA TP 19042-00 ANGELUS BLOCK RIALTO.GPJ Kling Consulting Group, Inc. 1/14/20

KCG KLING Consulting Group, Inc.

LOG OF EXPLORATORY BORING

Project:	**Angelus Block Rialto**	Boring No.:	**KB-2A**
Project Number:	**19042-00**	Driller:	**Calpac**
Date Drilled:	**12/17/19**	Drill Type:	**Hollow Stem**
Logged By:	**WAP**	Hammer Wt. / Drop:	**140lb / 30in**
		Ground Elev. [ft]:	**---**

Legend: Standard Split Spoon; Shelby Tube; Water Level ATD; California; Bulk Sample; Static Water Table

Depth [ft]	Graphic Log	Sample Type	Blows/6"	Moisture Content [%]	Dry Density, [pcf]	SOIL DESCRIPTION and CLASSIFICATION (USCS)	Pocket Pen. [tsf]	Lab Tests	Remarks
						@ **Surface - TOPSOIL**			
						Old Eolian and Dune Deposits (Qa):			
						@ **0.5 feet - Silty SAND (SM)** olive-brown, fine-grained, damp to moist.			
						@ **2.5 feet - Silty SAND (SM):** yellow-brown, fine-grained, damp, medium dense.			
5						@ **5.0 feet - SAME:**			
10						Total Depth: 10.0 feet. No groundwater encountered. Boring also used for Percolation Testing. Hole backfilled on 12/17/2019.			

HS BA TP 19042-00 ANGELUS BLOCK RIALTO.GPJ Kling Consulting Group, Inc. 1/14/20

KLING Consulting Group, Inc.

LOG OF EXPLORATORY BORING

Sheet **1** of **1**

Project:	**Angelus Block Rialto**	Boring No.:	**KB-3**
Project Number:	**19042-00**	Driller:	**Calpac**
Date Drilled:	**12/17/19**	Drill Type:	**Hollow Stem**
Logged By:	**WAP**	Hammer Wt. / Drop:	**140lb / 30in**
		Ground Elev. [ft]:	**---**

Legend: Standard Split Spoon; Shelby Tube; Water Level ATD; California; Bulk Sample; Static Water Table

Depth [ft]	Graphic Log	Sample Type	Blows/6"	Moisture Content [%]	Dry Density, [pcf]	SOIL DESCRIPTION and CLASSIFICATION (USCS)	Pocket Pen. [tsf]	Lab Tests	Remarks
						@ **Surface - TOPSOIL**			
						Old Eolian and Dune Deposits (Qa): @ **0.5 feet - Silty SAND (SM)** yellow-brown, fine-grained, damp to moist.			
		California	28 50/6"	9	105	@ **3.5 feet - Silty SAND (SM):** yellow-brown, fine to medium-grained, damp, very dense.			
5						Total Depth: 5.0 feet. No groundwater encountered. Boring also used for Percolation Testing. Hole backfilled on 12/17/2019.			

HS BA TP 19042-00 ANGELUS BLOCK RIALTO.GPJ Kling Consulting Group, Inc. 1/14/20

KCG KLING Consulting Group, Inc.

LOG OF EXPLORATORY BORING

Project:	**Angelus Block Rialto**	Boring No.:	**KB-4**
Project Number:	**19042-00**	Driller:	**Calpac**
Date Drilled:	**12/17/19**	Drill Type:	**Hollow Stem**
Logged By:	**WAP**	Hammer Wt. / Drop:	**140lb / 30in**
		Ground Elev. [ft]:	**---**

Standard Split Spoon — Shelby Tube — Water Level ATD
California — Bulk Sample — Static Water Table

Depth [ft]	Graphic Log	Sample Type	Blows/6"	Moisture Content [%]	Dry Density, [pcf]	SOIL DESCRIPTION and CLASSIFICATION (USCS)	Pocket Pen. [tsf]	Lab Tests	Remarks
						@ Surface - **TOPSOIL**			
						Old Eolian and Dune Deposits (Qa):			
						@ **0.5 feet - Silty SAND (SM)** olive-brown, fine-grained, moist.			
		California	11 16 25	5	105	@ **2.5 feet - Silty SAND (SM):** yellow-brown, fine-grained, damp, medium dense.			
5		California	15 20 25	10	107	@ **5.0 feet - SAME:**			
10		California	5 7 12	5	96	@ **10.0 feet - Silty SAND (SM):** gray-brown, fine-grained, damp to moist, medium dense.			
		Standard Split Spoon	5 10 17			@ **13.5 feet - Silty SAND (SM):** gray-brown, fine to coarse-grained with trace gravels, damp, medium dense.			
15									

Total Depth: 15.0 feet.
No groundwater encountered.
No caving.
Boring also used for Percolation Testing.
Hole backfilled on 12/17/2019.

KCG KLING Consulting Group, Inc.

LOG OF EXPLORATORY BORING

Project:	**Angelus Block Rialto**	Boring No.:	**KB-5**
Project Number:	**19042-00**	Driller:	**Calpac**
Date Drilled:	**12/17/19**	Drill Type:	**Hollow Stem**
Logged By:	**WAP**	Hammer Wt. / Drop:	**140lb / 30in**
		Ground Elev. [ft]:	**---**

Legend: Standard Split Spoon; Shelby Tube; Water Level ATD; California; Bulk Sample; Static Water Table

Depth [ft]	Graphic Log	Sample Type	Blows/6"	Moisture Content [%]	Dry Density, [pcf]	SOIL DESCRIPTION and CLASSIFICATION (USCS)	Pocket Pen. [tsf]	Lab Tests	Remarks
						@ Surface - **TOPSOIL**			
						Old Eolian and Dune Deposits (Qa): @ **0.5 feet - Silty SAND (SM)** yellow-brown, fine-grained, damp to moist.			
		California	5 10 13	6	98	@ **2.5 feet - Silty SAND (SM):** yellow-brown, fine-grained, damp, medium dense.		EI DS MAX SU	
5		California	4 7 11	2	104	@ **5.0 feet - Silty SAND (SM):** yellow-brown, fine-grained, dry to damp, medium dense.			

Total Depth: 6.5 feet.
No groundwater encountered.
No caving.
Boring also used for Percolation Testing.
Hole backfilled on 12/17/2019.

KLING Consulting Group, Inc.

LOG OF EXPLORATORY BORING

Project:	**Angelus Block Rialto**	Boring No.:	**KB-6**
Project Number:	**19042-00**	Driller:	**Calpac**
Date Drilled:	**12/17/19**	Drill Type:	**Hollow Stem**
Logged By:	**WAP**	Hammer Wt. / Drop:	**140lb / 30in**
		Ground Elev. [ft]:	**---**

Legend: Standard Split Spoon; Shelby Tube; Water Level ATD; California; Bulk Sample; Static Water Table

Depth [ft]	Graphic Log	Sample Type	Blows/6"	Moisture Content [%]	Dry Density, [pcf]	SOIL DESCRIPTION and CLASSIFICATION (USCS)	Pocket Pen. [tsf]	Lab Tests	Remarks
0						@ Surface - **TOPSOIL**			
						Old Eolian and Dune Deposits (Qa):			
						@ **0.5 feet - Silty SAND (SM)** yellow-brown, fine-grained, damp to moist.			
		California	10 50/5"	11	100	@ **2.5 feet - Silty SAND (SM):** brown, fine-grained, damp to moist, very dense.			
5		California	3 4 6	2	102	@ **5.0 feet - Silty SAND (SM):** yellow-brown, fine-grained, moist, loose.		CN	
10		California	7 13 16	2	101	@ **10.0 feet - Silty SAND (SM):** yellow-brown, fine-grained, damp, medium dense.			
15		Standard Split Spoon	5 7 8			@ **15.0 feet - Silty SAND (SM):** olive-brown, fine to coarse-grained with trace gravels, moist, medium dense.			

Total Depth: 16.5 feet.
No groundwater encountered.
No caving.
Boring also used for Percolation Testing.
Hole backfilled on 12/17/2019.

KLING Consulting Group, Inc.

LOG OF EXPLORATORY BORING

Project:	**Angelus Block Rialto**	Boring No.:	**KB-7**
Project Number:	**19042-00**	Driller:	**Calpac**
Date Drilled:	**12/17/19**	Drill Type:	**Hollow Stem**
Logged By:	**WAP**	Hammer Wt. / Drop:	**140lb / 30in**
		Ground Elev. [ft]:	**---**

Sample legend: Standard Split Spoon; Shelby Tube; Water Level ATD; California; Bulk Sample; Static Water Table

Depth [ft]	Graphic Log	Sample Type	Blows/6"	Moisture Content [%]	Dry Density, [pcf]	SOIL DESCRIPTION and CLASSIFICATION (USCS)	Pocket Pen. [tsf]	Lab Tests	Remarks
						Artificial Fill (Af) @ **0 to 0.5 feet - Silty SAND (SM):** red-gray, fine to coarse-grained, dry.			
						Old Eolian and Dune Deposits (Qa): @ **0.5 feet - Silty SAND (SM)** yellow-brown, fine-grained, moist.			
5		California	5 8 11	5	114	@ **3.5 feet - Silty SAND (SM):** yellow-brown, fine-grained, damp, medium dense.			

Total Depth: 5.0 feet.
No groundwater encountered.
Boring also used for Percolation Testing.
Hole backfilled on 12/17/2019.

KLING Consulting Group, Inc.

LOG OF EXPLORATORY BORING

Project:	**Angelus Block Rialto**	Boring No.:	**KB-8**
Project Number:	**19042-00**	Driller:	**Calpac**
Date Drilled:	**12/17/19**	Drill Type:	**Hollow Stem**
Logged By:	**WAP**	Hammer Wt. / Drop:	**140lb / 30in**
		Ground Elev. [ft]:	**---**

Legend: Standard Split Spoon; Shelby Tube; Water Level ATD; California; Bulk Sample; Static Water Table

Depth [ft]	Graphic Log	Sample Type	Blows/6"	Moisture Content [%]	Dry Density, [pcf]	SOIL DESCRIPTION and CLASSIFICATION (USCS)	Pocket Pen. [tsf]	Lab Tests	Remarks
0						**Artificial Fill (Af)** @ **0 to 0.5 feet - Silty SAND (SM):** red-gray, fine to coarse-grained, dry.			
0.5						**Old Eolian and Dune Deposits (Qa):** @ **0.5 feet - Silty SAND (SM)** yellow-brown, fine-grained, moist.			
2.5		California	5 6 8	5	107	@ **2.5 feet - Silty SAND (SM)** yellow-brown, fine-grained, moist, loose.			
5		California	5 8 9	9	114	@ **5.0 feet - Silty SAND (SM)** yellow-brown, fine-grained with some trace gravels, moist, medium dense.			
10		California	5 15 18	6	112	@ **10.0 feet - Silty SAND (SM)** brown, fine to coarse-grained, moist, medium dense.			
13						@ **13.0 feet - Silty SAND (SM)** gray-brown, fine to coarse-grained with gravels, damp to moist, medium dense.			
15		Standard Split Spoon	8 15 15			Total Depth: 15.0 feet. No groundwater encountered. Boring also used for Percolation Testing. Hole backfilled on 12/17/2019.			

LOG OF EXPLORATORY BORING

Project:	**Angelus Block Rialto**	Boring No.:	**KB-9**
Project Number:	**19042-00**	Driller:	**Calpac**
Date Drilled:	**12/17/19**	Drill Type:	**Hollow Stem**
Logged By:	**WAP**	Hammer Wt. / Drop:	**140lb / 30in**
		Ground Elev. [ft]:	**---**

Legend: Standard Split Spoon; Shelby Tube; Water Level ATD; California; Bulk Sample; Static Water Table

Depth [ft]	Graphic Log	Sample Type	Blows/6"	Moisture Content [%]	Dry Density, [pcf]	SOIL DESCRIPTION and CLASSIFICATION (USCS)	Pocket Pen. [tsf]	Lab Tests	Remarks
						@ **Surface - TOPSOIL**			
						Old Eolian and Dune Deposits (Qa): @ **0.5 feet - Silty SAND (SM)** yellow-brown, fine-grained, moist.			
		California	2 3 4	8	107	@ **2.5 feet - Silty SAND (SM):** yellow-brown, fine-grained, moist, loose.		SU	
5		California	3 5 6	6	113	@ **5.0 feet - SAME:** trace coarse gravels.			
10		California	8 13 16	3	125	@ **10.0 feet - Silty SAND (SM):** yellow-brown, fine to coarse-grained with gravels, moist, medium dense.			
15		Standard Split Spoon	8 8 10			@ **5.0 feet - SAME**			
20		California	17 25 47	2	120	@ **20.0 feet - Silty SAND (SM):** yellow-brown, fine to coarse-grained with gravels, moist, dense.			

HS BA TP 19042-00 ANGELUS BLOCK RIALTO.GPJ Kling Consulting Group, Inc. 1/14/20

KCG KLING Consulting Group, Inc.

LOG OF EXPLORATORY BORING

Project:	**Angelus Block Rialto**	Boring No.:	**KB-9**
Project Number:	**19042-00**	Driller:	**Calpac**
Date Drilled:	**12/17/19**	Drill Type:	**Hollow Stem**
Logged By:	**WAP**	Hammer Wt. / Drop:	**140lb / 30in**
		Ground Elev. [ft]:	**---**

Legend: Standard Split Spoon; Shelby Tube; Water Level ATD; California; Bulk Sample; Static Water Table

Depth [ft]	Graphic Log	Sample Type	Blows/6"	Moisture Content [%]	Dry Density, [pcf]	SOIL DESCRIPTION and CLASSIFICATION (USCS)	Pocket Pen. [tsf]	Lab Tests	Remarks
		Standard Split Spoon	13 24 37			@ **25.0 feet - <u>Silty SAND (SM):</u>** gray, fine to coarse-grained with gravels, damp, very dense.			
30		California	22 39 47	2	121	@ **30.0 feet - SAME**			
						Total Depth: 31.5 feet. No groundwater encountered. Hole backfilled on 12/17/2019.			

HS BA TP 19042-00 ANGELUS BLOCK RIALTO.GPJ Kling Consulting Group, Inc. 1/14/20

KCG KLING Consulting Group, Inc.

LOG OF EXPLORATORY BORING

Project:	**Angelus Block Rialto**	Boring No.:	**KB-10**
Project Number:	**19042-00**	Driller:	**Calpac**
Date Drilled:	**12/17/19**	Drill Type:	**Hollow Stem**
Logged By:	**WAP**	Hammer Wt. / Drop:	**140lb / 30in**
		Ground Elev. [ft]:	**---**

Legend: Standard Split Spoon; Shelby Tube; Water Level ATD; California; Bulk Sample; Static Water Table

Depth [ft]	Graphic Log	Sample Type	Blows/6"	Moisture Content [%]	Dry Density, [pcf]	SOIL DESCRIPTION and CLASSIFICATION (USCS)	Pocket Pen. [tsf]	Lab Tests	Remarks
0						@ **Surface - TOPSOIL**			
						Old Eolian and Dune Deposits (Qa):			
0.5						@ **0.5 feet - Silty SAND (SM)** yellow-brown, fine-grained, moist.			
2.5		California	3 6 7	4	112	@ **2.5 feet - Silty SAND (SM):** yellow-brown, fine-grained, moist, loose.			
5		California	4 6 7	5	110	@ **5.0 feet - SAME**			
10		California	8 12 14	4	115	@ **10.0 feet - Silty SAND (SM):** yellow-brown, fine to coarse-grained with gravels, moist, medium dense.			
15		Standard Split Spoon	6 10 12			@ **15.0 feet - SAME**			

Total Depth: 16.5 feet.
No groundwater encountered.
Hole backfilled on 12/17/2019.

LOG OF EXPLORATORY BORING

Project:	**Angelus Block Rialto**	Boring No.:	**KB-11**
Project Number:	**19042-00**	Driller:	**Calpac**
Date Drilled:	**12/18/19**	Drill Type:	**Hollow Stem**
Logged By:	**WAP**	Hammer Wt. / Drop:	**140lb / 30in**
		Ground Elev. [ft]:	**---**

Legend: Standard Split Spoon; Shelby Tube; Water Level ATD; California; Bulk Sample; Static Water Table

Depth [ft]	Graphic Log	Sample Type	Blows/6"	Moisture Content [%]	Dry Density, [pcf]	SOIL DESCRIPTION and CLASSIFICATION (USCS)	Pocket Pen. [tsf]	Lab Tests	Remarks
0						@ **Surface - TOPSOIL**			
						Old Eolian and Dune Deposits (Qa): @ **0.5 feet - Silty SAND (SM)** yellow-brown, fine-grained, moist.			
2.5		California	9, 15, 22	3	120	@ **2.5 feet - Silty SAND (SM):** yellow-brown, fine-grained, damp, medium dense, trace rootlets.			
5		California	11, 17, 21	2	118	@ **5.0 feet - Silty SAND (SM):** yellow-brown, fine to coarse-grained, damp, medium dense.			
10		California	16, 29, 45	2	122	@ **10.0 feet - Silty SAND (SM):** yellow-brown, fine to coarse-grained, damp, dense.			
15		Standard Split Spoon	10, 14, 22			@ **15.0 feet - SAME:** trace gravels.			

Total Depth: 16.5 feet.
No groundwater encountered.
Hole backfilled on 12/18/2019.

HS BA TP 19042-00 ANGELUS BLOCK RIALTO.GPJ Kling Consulting Group, Inc. 1/14/20

KCG KLING Consulting Group, Inc.

LOG OF EXPLORATORY BORING

Project:	Angelus Block Rialto	Boring No.:	**KB-12**
Project Number:	19042-00	Driller:	Calpac
Date Drilled:	12/18/19	Drill Type:	Hollow Stem
Logged By:	WAP	Hammer Wt. / Drop:	140lb / 30in
		Ground Elev. [ft]:	---

Legend: Standard Split Spoon; Shelby Tube; Water Level ATD; California; Bulk Sample; Static Water Table

Depth [ft]	Graphic Log	Sample Type	Blows/6"	Moisture Content [%]	Dry Density, [pcf]	SOIL DESCRIPTION and CLASSIFICATION (USCS)	Pocket Pen. [tsf]	Lab Tests	Remarks
						@ Surface - TOPSOIL			
						Old Eolian and Dune Deposits (Qa): @ 0.5 feet - Silty SAND (SM) yellow-brown, fine-grained, moist.			
		California	5 7 13	5	103	@ 2.5 feet - Silty SAND (SM): yellow-brown, fine-grained, damp, medium dense.			
5		California	6 11 15	3	107	@ 5.0 feet - SAME			
10		California	15 21 25	4	115	@ 10.0 feet - Silty SAND (SM): yellow-brown, fine to coarse-grained with trace gravels, damp, dense.			
15		Standard Split Spoon	16 17 23			@ 15.0 feet - SAME			

Total Depth: 16.5 feet.
No groundwater encountered.
Hole backfilled on 12/18/2019.

HS BA TP 19042-00 ANGELUS BLOCK RIALTO.GPJ Kling Consulting Group, Inc. 1/14/20

KCG KLING Consulting Group, Inc.

LOG OF EXPLORATORY BORING

Sheet **1** of **1**

Project:	**Angelus Block Rialto**	Boring No.:	**KB-13**
Project Number:	**19042-00**	Driller:	**Calpac**
Date Drilled:	**12/18/19**	Drill Type:	**Hollow Stem**
Logged By:	**WAP**	Hammer Wt. / Drop:	**140lb / 30in**
		Ground Elev. [ft]:	**---**

Legend: Standard Split Spoon; Shelby Tube; Water Level ATD; California; Bulk Sample; Static Water Table

Depth [ft]	Graphic Log	Sample Type	Blows/6"	Moisture Content [%]	Dry Density, [pcf]	SOIL DESCRIPTION and CLASSIFICATION (USCS)	Pocket Pen. [tsf]	Lab Tests	Remarks
						Artificial Fill (Af) @ **0 to 0.5 feet - Silty SAND (SM):** red-gray, fine to coarse-grained with gravels, dry to damp.			
						Old Eolian and Dune Deposits (Qa): @ **0.5 feet - Silty SAND (SM)** yellow-brown, fine-grained, moist.			
		California	5 7 11	7	112	@ **2.5 feet - Silty SAND (SM):** yellow-brown, fine to medium-grained, moist, medium dense.			
5		California	5 7 12	5	104	@ **5.0 feet - Silty SAND (SM):** yellow-brown, fine-grained, moist, medium dense.			
10		California	6 10 18	3	116	@ **10.0 feet - Silty SAND (SM):** yellow-brown, fine to medium-grained, moist, medium dense.			

Total Depth: 11.5 feet.
No groundwater encountered.
Hole backfilled on 12/18/2019.

KCG KLING Consulting Group, Inc.

LOG OF EXPLORATORY BORING

Project:	**Angelus Block Rialto**	Boring No.:	**KB-14**
Project Number:	**19042-00**	Driller:	**Calpac**
Date Drilled:	**12/18/19**	Drill Type:	**Hollow Stem**
Logged By:	**WAP**	Hammer Wt. / Drop:	**140lb / 30in**
		Ground Elev. [ft]:	**---**

Legend: Standard Split Spoon; Shelby Tube; Water Level ATD; California; Bulk Sample; Static Water Table

Depth [ft]	Graphic Log	Sample Type	Blows/6"	Moisture Content [%]	Dry Density, [pcf]	SOIL DESCRIPTION and CLASSIFICATION (USCS)	Pocket Pen. [tsf]	Lab Tests	Remarks
		Bulk				**@ Surface - TOPSOIL**			
						Old Eolian and Dune Deposits (Qa):			
						@ 0.5 feet - Silty SAND (SM) yellow-brown, fine-grained, moist.			
		California	5 7 9	4	113	**@ 2.5 feet - Silty SAND (SM):** yellow-brown, fine to coarse-grained, moist, medium dense.		DS MAX SU	
5		California	4 6 12	4	114	**@ 5.0 feet - Silty SAND (SM):** yellow-brown, fine-grained, moist, medium dense.			
10		California	5 12 17	2	112	**@ 10.0 feet - Silty SAND (SM):** brown, fine to coarse-grained, damp to moist, medium dense.			
15		Standard Split Spoon	10 14 18			**@ 15.0 feet - Silty SAND (SM):** yellow-brown, fine to coarse-grained with gravels, damp, dense.			
20		California	21 50/5"	1		**@ 20.0 feet - Silty SAND (SM):** gray, fine to coarse-grained with gravels, dry to damp, very dense.			

KCG KLING Consulting Group, Inc.

LOG OF EXPLORATORY BORING

Project:	**Angelus Block Rialto**	Boring No.:	**KB-14**
Project Number:	**19042-00**	Driller:	**Calpac**
Date Drilled:	**12/18/19**	Drill Type:	**Hollow Stem**
Logged By:	**WAP**	Hammer Wt. / Drop:	**140lb / 30in**
		Ground Elev. [ft]:	**---**

Legend: Standard Split Spoon; Shelby Tube; Water Level ATD; California; Bulk Sample; Static Water Table

Depth [ft]	Graphic Log	Sample Type	Blows/6"	Moisture Content [%]	Dry Density, [pcf]	SOIL DESCRIPTION and CLASSIFICATION (USCS)	Pocket Pen. [tsf]	Lab Tests	Remarks
		Standard Split Spoon	25 50/6"			**@ 25.0 feet - SAME**			
30		California	16 50/5"	3	116	**@ 30.0 feet - SAME**			

Total Depth: 31.5 feet.
No groundwater encountered.
Hole backfilled on 12/18/2019.

KCG KLING Consulting Group, Inc.

LOG OF EXPLORATORY BORING

Project:	**Angelus Block Rialto**	Boring No.:	**KB-15**
Project Number:	**19042-00**	Driller:	**Calpac**
Date Drilled:	**12/18/19**	Drill Type:	**Hollow Stem**
Logged By:	**WAP**	Hammer Wt. / Drop:	**140lb / 30in**
		Ground Elev. [ft]:	**---**

Legend: Standard Split Spoon; Shelby Tube; Water Level ATD; California; Bulk Sample; Static Water Table

Depth [ft]	Graphic Log	Sample Type	Blows/6"	Moisture Content [%]	Dry Density, [pcf]	SOIL DESCRIPTION and CLASSIFICATION (USCS)	Pocket Pen. [tsf]	Lab Tests	Remarks
						@ **Surface - TOPSOIL**			
						Old Eolian and Dune Deposits (Qa): @ **0.5 feet - Silty SAND (SM)** yellow-brown, fine-grained, moist.			
		California	8 12 18	3	116	@ **2.5 feet - Silty SAND (SM):** yellow-brown, fine to coarse-grained, damp, medium dense.			
5		California	10 16 20	5	110	@ **5.0 feet - SAME**		CN	
10		California	10 18 25	1	113	@ **10.0 feet - Silty SAND (SM):** gray-brown, fine to coarse-grained with trace gravels, dry to damp, medium dense.			

Total Depth: 11.5 feet.
No groundwater encountered.
Hole backfilled on 12/18/2019.

KLING Consulting Group, Inc.

LOG OF EXPLORATORY BORING

Project:	**Angelus Block Rialto**	Boring No.:	**KB-16**
Project Number:	**19042-00**	Driller:	**Calpac**
Date Drilled:	**12/18/19**	Drill Type:	**Hollow Stem**
Logged By:	**WAP**	Hammer Wt. / Drop:	**140lb / 30in**
		Ground Elev. [ft]:	**---**

Legend: Standard Split Spoon; Shelby Tube; Water Level ATD; California; Bulk Sample; Static Water Table

Depth [ft]	Graphic Log	Sample Type	Blows/6"	Moisture Content [%]	Dry Density, [pcf]	SOIL DESCRIPTION and CLASSIFICATION (USCS)	Pocket Pen. [tsf]	Lab Tests	Remarks
0						@ **Surface - TOPSOIL**			
0.5						**<u>Old Eolian and Dune Deposits (Qa):</u>** @ **0.5 feet - <u>Silty SAND (SM)</u>** yellow-brown, fine-grained, moist.			
2.5		California	4 6 8	8	111	@ **2.5 feet - <u>Silty SAND (SM):</u>** yellow-brown, fine-grained, moist, loose.			
5		California	8 13 18	12	109	@ **5.0 feet - <u>Silty SAND (SM):</u>** yellow-brown, fine-grained, moist, medium dense.			
10		California	15 15 25	2	113	@ **10.0 feet - <u>Silty SAND (SM):</u>** olive-brown, fine to coarse-grained, damp to moist, medium dense.			
15		Standard Split Spoon	10 15 27			@ **15.0 feet - <u>Silty SAND (SM):</u>** olive-brown, fine to coarse-grained with trace gravels, damp, dense.			

Total Depth: 16.5 feet.
No groundwater encountered.
Hole backfilled on 12/18/2019.

LOG OF EXPLORATORY BORING

Project:	**Angelus Block Rialto**	Boring No.:	**KB-17**
Project Number:	**19042-00**	Driller:	**Calpac**
Date Drilled:	**12/18/19**	Drill Type:	**Hollow Stem**
Logged By:	**WAP**	Hammer Wt. / Drop:	**140lb / 30in**
		Ground Elev. [ft]:	**---**

Legend: Standard Split Spoon; Shelby Tube; Water Level ATD; California; Bulk Sample; Static Water Table

Depth [ft]	Graphic Log	Sample Type	Blows/6"	Moisture Content [%]	Dry Density, [pcf]	SOIL DESCRIPTION and CLASSIFICATION (USCS)	Pocket Pen. [tsf]	Lab Tests	Remarks
0		Bulk				**Artificial Fill (Af)** @ **0 to 0.5 feet - Silty SAND (SM):** red-gray, fine to coarse-grained with trace gravels, damp to moist. **Old Eolian and Dune Deposits (Qa):** @ **0.5 feet - Silty SAND (SM)** yellow-brown, fine-grained, moist.		EI SU	
2.5		California	9 13 17	2	107	@ **2.5 feet - Silty SAND (SM):** yellow-brown, fine-grained, moist, medium dense.			
5		California	7 12 17	3	108	@ **5.0 feet - SAME**		CN	
10		California	12 18 31	4	115	@ **10.0 feet - Silty SAND (SM):** yellow-brown, fine-grained, damp, dense.			
15		Standard Split Spoon	6 13 18			@ **15.0 feet - Silty SAND (SM):** yellow-brown, fine to coarse-grained with gravels, damp, dense.			
20		California	21 50/6"			@ **20.0 feet - SAME:** becomes very dense.			

KCG KLING Consulting Group, Inc.

LOG OF EXPLORATORY BORING

Project:	**Angelus Block Rialto**	Boring No.:	**KB-17**
Project Number:	**19042-00**	Driller:	**Calpac**
Date Drilled:	**12/18/19**	Drill Type:	**Hollow Stem**
Logged By:	**WAP**	Hammer Wt. / Drop:	**140lb / 30in**
		Ground Elev. [ft]:	**---**

Legend: Standard Split Spoon; Shelby Tube; Water Level ATD; California; Bulk Sample; Static Water Table

Depth [ft]	Graphic Log	Sample Type	Blows/6"	Moisture Content [%]	Dry Density, [pcf]	SOIL DESCRIPTION and CLASSIFICATION (USCS)	Pocket Pen. [tsf]	Lab Tests	Remarks
		Standard Split Spoon	18 26 28	1	120	@ **25.0 feet - <u>Silty SAND (SM):</u>** yellow-brown, fine to coarse-grained with trace gravels and cobbles, dry to damp, very dense.			
30		California	13 50/5"	1	113	@ **30.0 feet - <u>Silty SAND (SM):</u>** yellow-brown, fine to coarse-grained with trace gravels, dry to damp, very dense.			
						Total Depth: 31.5 feet. No groundwater encountered. Hole backfilled on 12/18/2019.			

KLING Consulting Group, Inc.

LOG OF EXPLORATORY BORING

Project:	**Angelus Block Rialto**	Boring No.:	**KB-18**
Project Number:	**19042-00**	Driller:	**Calpac**
Date Drilled:	**12/18/19**	Drill Type:	**Hollow Stem**
Logged By:	**WAP**	Hammer Wt. / Drop:	**140lb / 30in**
		Ground Elev. [ft]:	**---**

Legend: Standard Split Spoon; Shelby Tube; Water Level ATD; California; Bulk Sample; Static Water Table

Depth [ft]	Graphic Log	Sample Type	Blows/6"	Moisture Content [%]	Dry Density, [pcf]	SOIL DESCRIPTION and CLASSIFICATION (USCS)	Pocket Pen. [tsf]	Lab Tests	Remarks
0						@ **Surface - TOPSOIL**			
						Old Eolian and Dune Deposits (Qa): @ **0.5 feet - Silty SAND (SM)** yellow-brown, fine-grained, moist.			
2.5		California	7 10 10	6	116	@ **2.5 feet - Silty SAND (SM):** yellow-brown, fine to medium-grained, moist, medium dense.			
5		California	4 6 8	7	112	@ **5.0 feet - Silty SAND (SM):** yellow-brown, fine to coarse-grained, moist, loose.			
10		California	5 10 19	5	120	@ **10.0 feet - Silty SAND (SM):** yellow-brown, fine to coarse-grained with trace gravels, moist, medium dense.			
15		Standard Split Spoon	7 13 18			@ **15.0 feet - SAME:** becomes dense.			

Total Depth: 16.5 feet.
No groundwater encountered.
Hole backfilled on 12/18/2019.

KCG KLING Consulting Group, Inc.

APPENDIX C

LABORATORY TEST RESULTS

JOB NAME :	ANGELUS BLOCK RIALTO	JOB NUMBER:	19042-00
SAMPLE NUMBER :		TESTED BY :	RB
SAMPLE LOCATION :	B - 5 @ 0 - 5'	DATE :	2-Jan-20
SAMPLE DESCRIPTIONS / CLASSIFICATION :	LT. BROWN SILTY SAND TR CLAY (SM)		

TEST STANDARD	ASTM D-698 - 00			**ASTM D 1557-02**		
METHOD	A	B	C	**A**	B	C

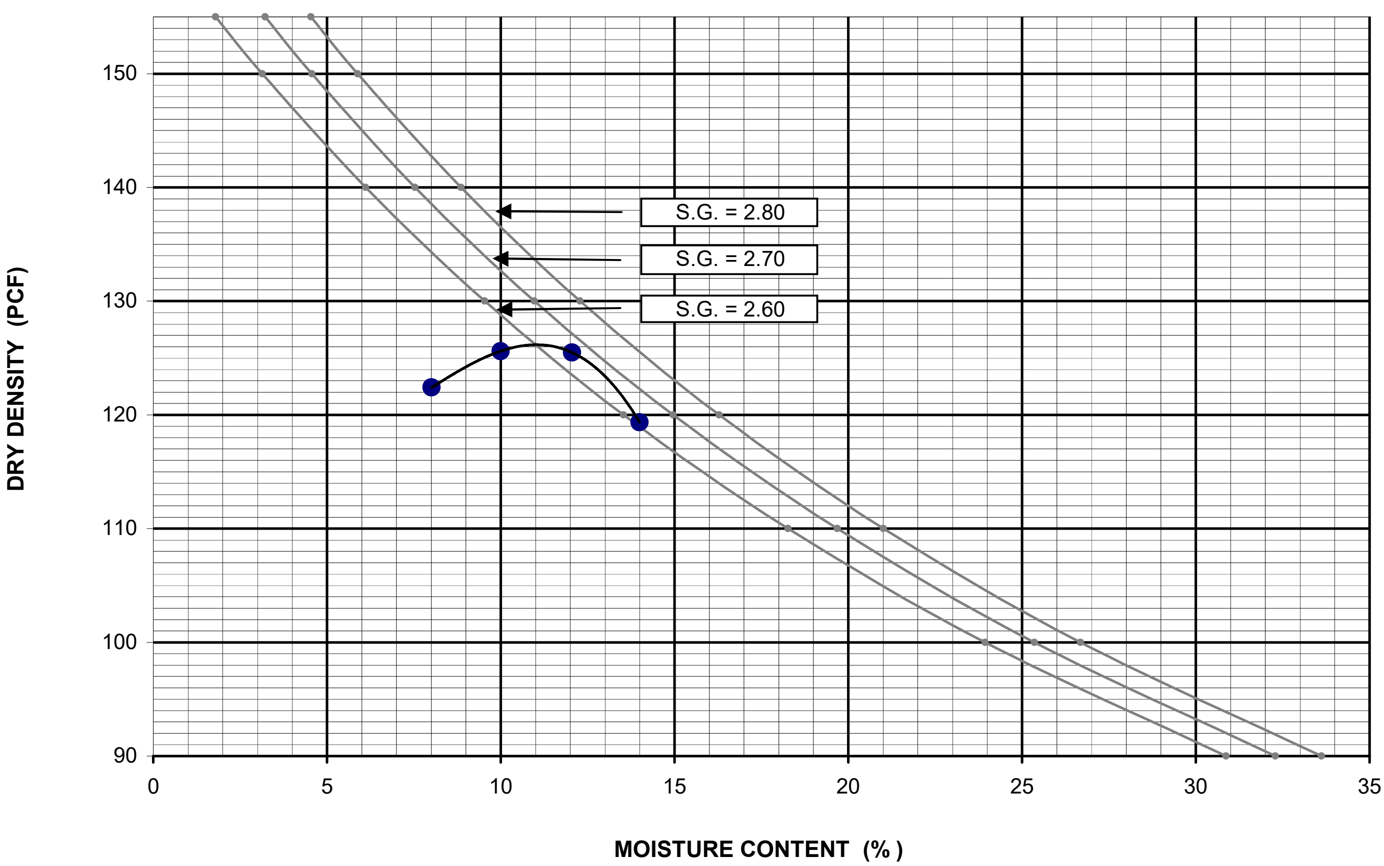
TRIAL NUMBER	1	2	3	4	5
WATER ADDED (ML)	0	50	100	150	
WT. SOIL + MOLD (GMS)	3973	4063	4100	4031	
WT.OF MOLD (GMS)	1974	1974	1974	1974	
WT. OF WET SOIL (GMS)	1999	2089	2126	2057	
WET DENSITY (PCF)	132.2	138.2	140.6	136.0	
CAN NUMBER	R	M	N	S	
WET SOIL + TARE (GMS)	309.38	310.75	314.18	318.70	
DRY SOIL + TARE (GMS)	286.43	282.51	280.39	279.56	
TARE (GMS)	0.00	0.00	0.00	0.00	
DRY SOIL (GMS)	286.43	282.51	280.39	279.56	
WATER (GMS)	22.95	28.24	33.79	39.14	
MOISTURE CONTENT (%)	8.0	10.0	12.1	14.0	
DRY DENSITY (PCF)	122.4	125.6	125.5	119.3	

DIAMETER OF MOLD:	4	In.
VOLUME OF MOLD:	0.0333	Cu.Ft.
SCALPED ON SIEVE SIZE/NO.:	#4	
PERCENT RETAINED,(%) :		
MAXIMUM DRY DENSITY:	**126.5**	Pcf.
OPT. MOIST. CONTENT :	**11.0**	%

FOR OVERSIZE CORRECTION (ASTM D4718):

%,Finer Fraction =	-	% Moisture =	-
%,Oversize Fraction =	-	Assumed Sp.Gr.	2.64
Corrected MDD of Total Materials,(PCF) =	-		
Corrected OMC of Total Materials, (%) =	-		

REMARKS :



18008 Sky Park Circle, Suite 250
Irvine,Ca. 92614
Tel: (949)797-6241 Fax: (949)797-6260

KLING Consulting Group, Inc.

MAXIMUM DENSITY TEST

JOB NAME :	ANGELUS BLOCK RIALTO	JOB NUMBER:	19042-00
SAMPLE NUMBER :		TESTED BY :	RB
SAMPLE LOCATION :	B - 14 @ 0 - 5'	DATE :	6-Jan-20
SAMPLE DESCRIPTIONS / CLASSIFICATION :	DK. BROWN SILTY FINE SAND W/ TRACE OF CLAY (SM)		

TEST STANDARD	ASTM D-698 - 00			**ASTM D 1557-02**		
METHOD	A	B	C	**A**	B	C

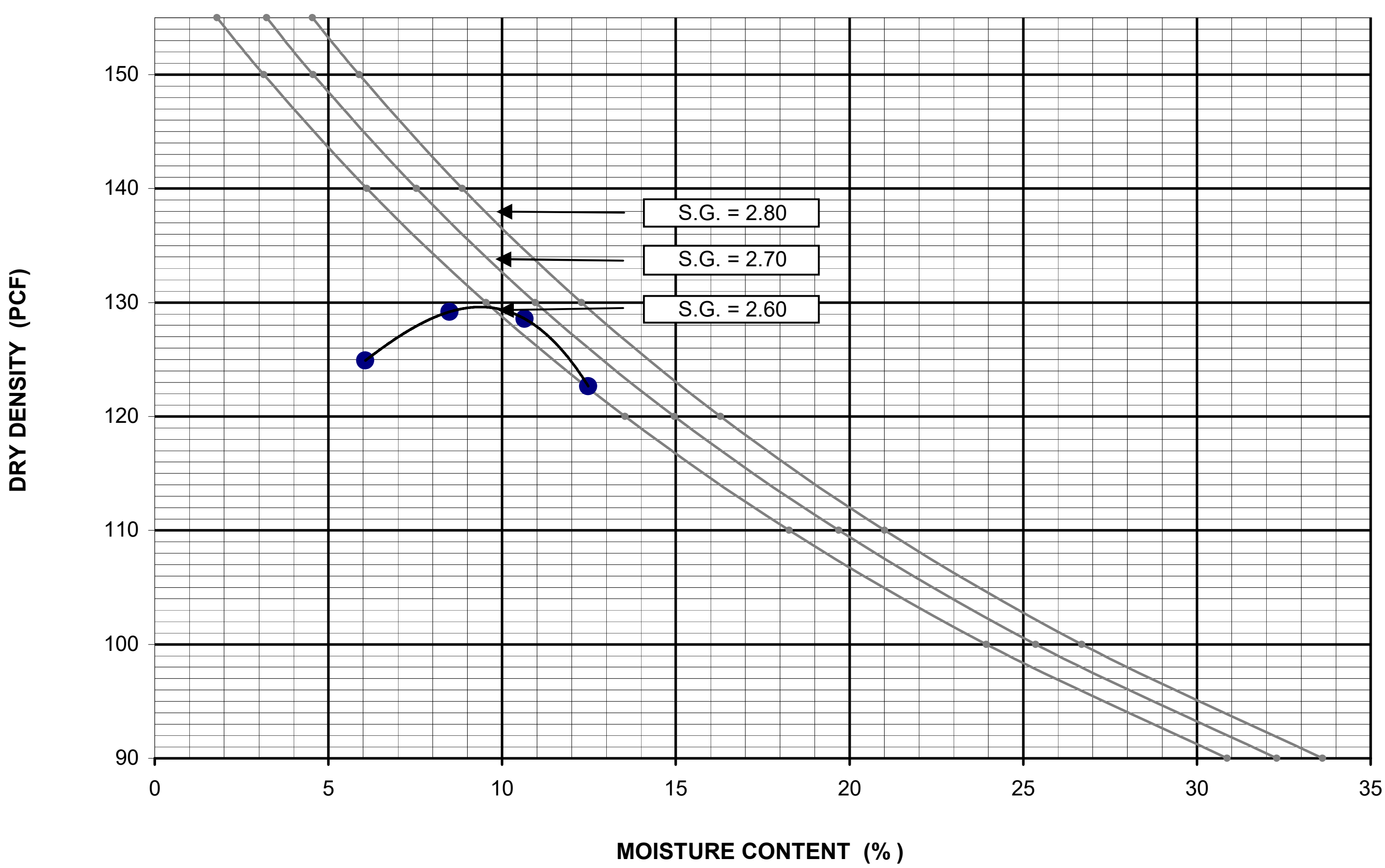
TRIAL NUMBER	1	2	3	4	5
WATER ADDED (ML)	-	0	50	100	
WT. SOIL + MOLD (GMS)	3977	4093	4125	4060	
WT.OF MOLD (GMS)	1974	1974	1974	1974	
WT. OF WET SOIL (GMS)	2003	2119	2151	2086	
WET DENSITY (PCF)	132.5	140.1	142.3	138.0	
CAN NUMBER	S	R	M	N	
WET SOIL + TARE (GMS)	302.26	311.13	314.59	318.59	
DRY SOIL + TARE (GMS)	284.99	286.80	284.31	283.24	
TARE (GMS)	0.00	0.00	0.00	0.00	
DRY SOIL (GMS)	284.99	286.80	284.31	283.24	
WATER (GMS)	17.27	24.33	30.28	35.35	
MOISTURE CONTENT (%)	6.1	8.5	10.7	12.5	
DRY DENSITY (PCF)	124.9	129.2	128.6	122.7	

DIAMETER OF MOLD:	4	In.
VOLUME OF MOLD:	0.0333	Cu.Ft.
SCALPED ON SIEVE SIZE/NO.:	#4	
PERCENT RETAINED,(%) :		
MAXIMUM DRY DENSITY:	**129.5**	Pcf.
OPT. MOIST. CONTENT :	**9.5**	%

FOR OVERSIZE CORRECTION (ASTM D4718):

%,Finer Fraction =	-	% Moisture =	-
%,Oversize Fraction =	-	Assumed Sp.Gr.	2.64
Corrected MDD of Total Materials,(PCF) =	**-**		
Corrected OMC of Total Materials, (%) =	**-**		

REMARKS :



KCG KLING Consulting Group, Inc.
18008 Sky Park Circle, Suite 250
Irvine,Ca. 92614
Tel: (949)797-6241 Fax: (949)797-6260

MAXIMUM DENSITY TEST

Project Name :	ANGELUS BLOCK RIALTO	Project No. :	19042-00
Boring / Sample No :	B - 14	Depth : 0 - 5' (ft.)	Tested By : RB Date: 7-Jan-20
Sample Descriptions / Classification :	DK. BROWN SILTY FINE SAND W/ TRACE OF CLAY (SM)		

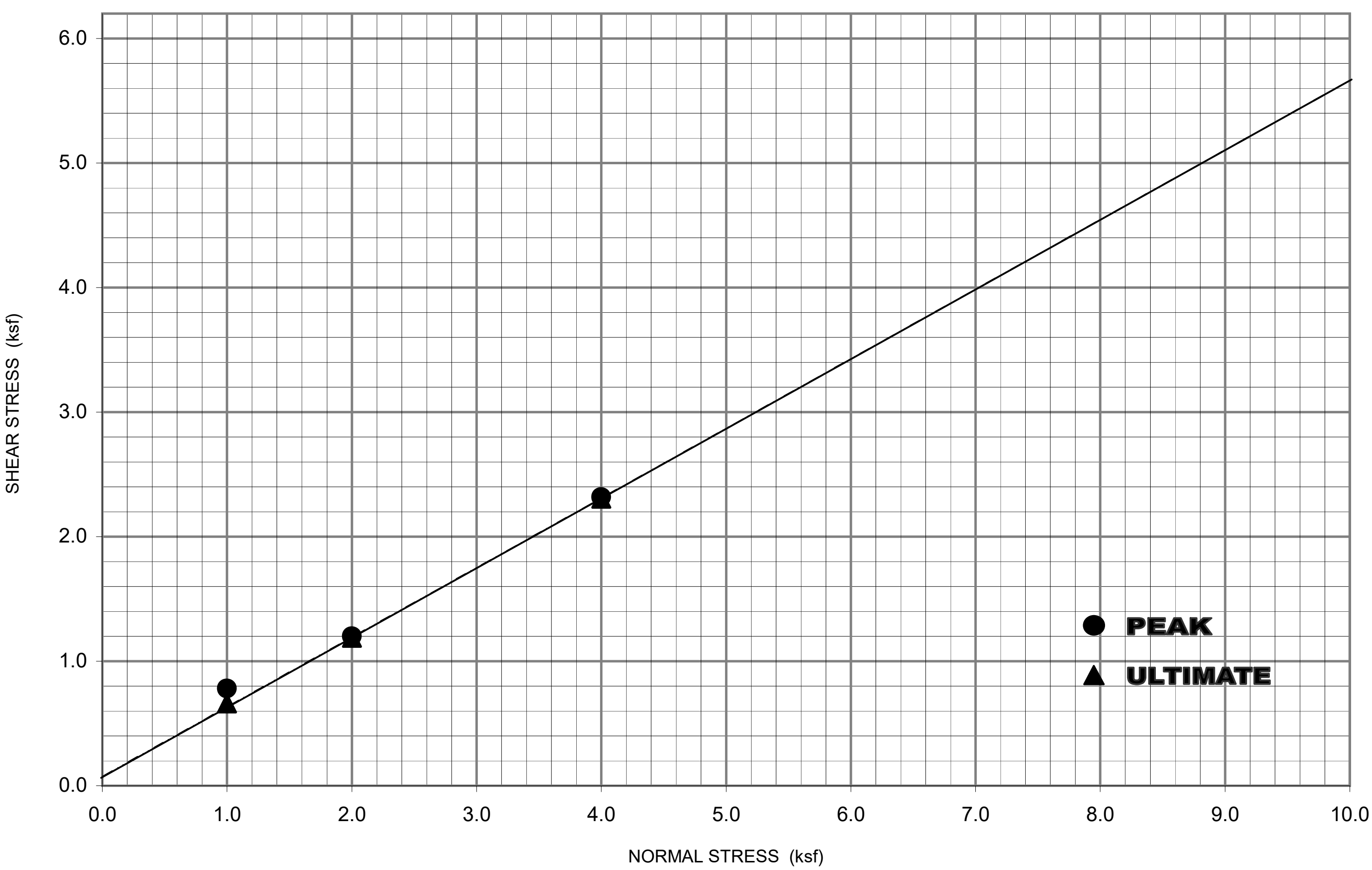
Applied Normal Load (ksf)	1.0		2.0		4.0	
Shear Stress,(Peak) (ksf)	0.780		1.200		2.316	
Shear Stress,(Ultimate) (ksf)	0.660		1.188		2.304	
Density and Saturation	Initial	Final	Initial	Final	Initial	Final
Wet Weight of Soil + Ring (gms)	196.95	203.53	196.9	203.53	197.10	204.62
Dry Weight of Soil + Ring (gms)		183.69		183.64		183.84
Weight of Water (gms)	-	46.54	-	47.28	-	45.81
Weight of Ring (gms)	-	44.08	-	44.02	-	44.22
Weight of Dry Soil (gms)	-	139.61	-	139.62	-	139.62
Moisture Content (%)	9.5	33.3	9.5	33.9	9.5	32.8
Wet Density (pcf)	127.6	133.1	127.7	133.1	127.7	133.9
Dry Density (pcf)	-	99.8	-	99.5	-	100.8
Specific Gravity, G_s (Assumed)	2.68					
Thickness of Specimen, (in.)	1.00					
Degree of Saturation, (%)	37.7	132.3	37.4	133.2	38.6	133.4
Void Ratio	-	0.675	-	0.681	-	0.659

Lateral Displacement, d_h	0.36	(in.)
Displacement Rate, d_r	0.05	(in./min.)
Elapsed Time of Test, t_e	7.20	(min.)

Specimen : Undisturbed :
Remolded : X
Reconstituted : -

	PEAK	ULTIMATE
Cohesion,c (psf)	50	50
Friction Angle, ϕ	29	29

Remarks : SAMPLE REMOLDED TO 90% OF (129.5 PCF @ 9.5%)



KCG KLING Consulting Group, Inc.
8008 Sky Park Circle, Suite 250
Irvine, Ca. 92614
Tel: (949)797-6241 Fax: (949)797-6260

DIRECT SHEAR TEST
(ASTM D3080)

Project Name :	ANGELUS BLOCK RIALTO	Project No. :	19042-00
Boring / Sample No :	B - 5	Depth : 0 - 5' (ft.)	Tested By : RB Date: 3-Jan-20
Sample Descriptions / Classification :	LT. BROWN SILTY SAND TR CLAY (SM)		

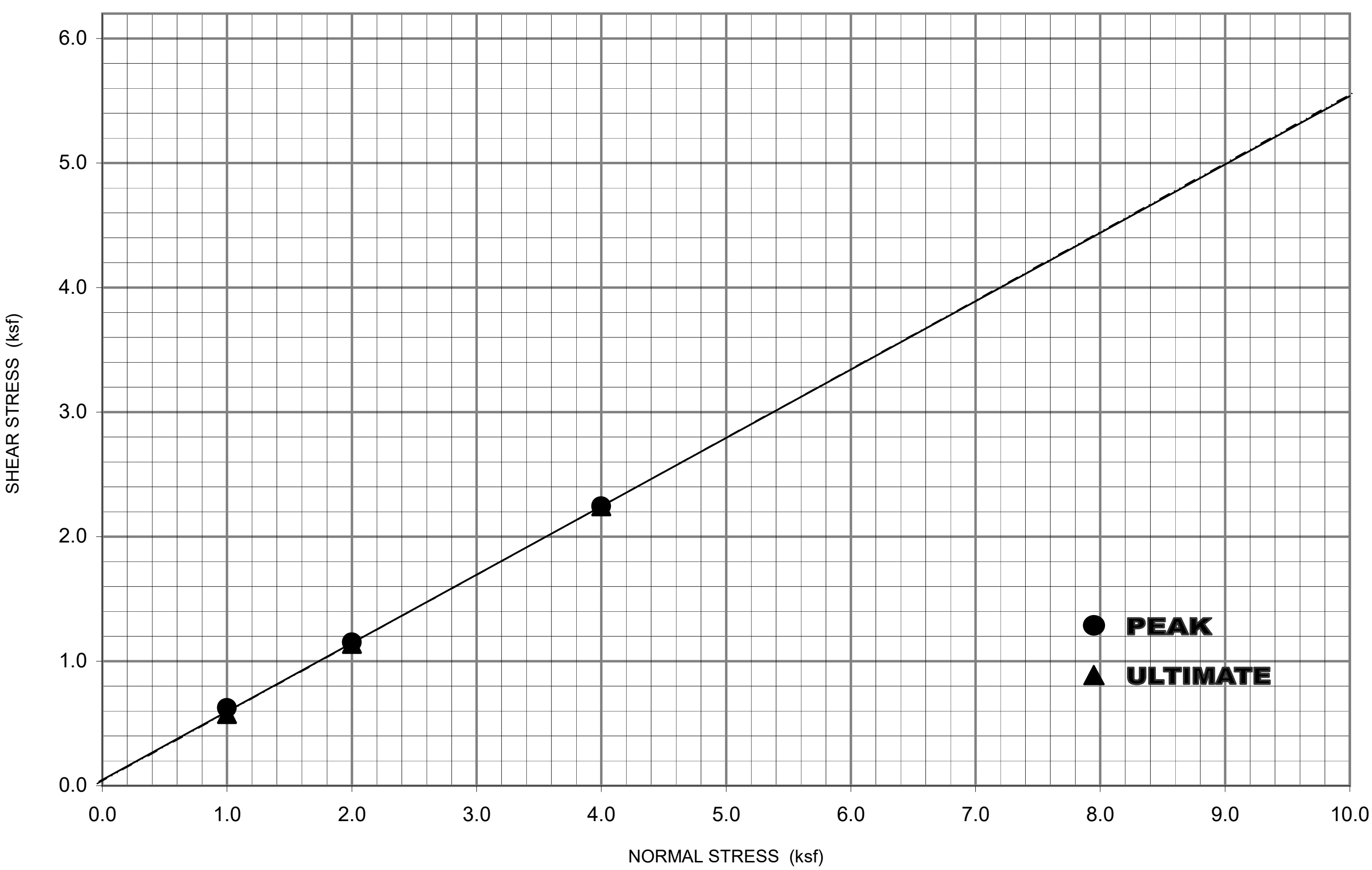
Applied Normal Load (ksf)	1.0		2.0		4.0	
Shear Stress,(Peak) (ksf)	0.624		1.152		2.244	
Shear Stress,(Ultimate) (ksf)	0.576		1.140		2.244	
Density and Saturation	Initial	Final	Initial	Final	Initial	Final
Wet Weight of Soil + Ring (gms)	196.44	205.32	196.7	206.13	196.32	205.76
Dry Weight of Soil + Ring (gms)		181.44		181.70		181.32
Weight of Water (gms)	-	46.54	-	47.28	-	45.81
Weight of Ring (gms)	-	45.07	-	45.33	-	44.95
Weight of Dry Soil (gms)	-	136.37	-	136.37	-	136.37
Moisture Content (%)	11.0	34.1	11.0	34.7	11.0	33.6
Wet Density (pcf)	126.4	133.8	126.4	134.2	126.4	134.2
Dry Density (pcf)	-	99.7	-	99.7	-	100.5
Specific Gravity,G_s (Assumed)	2.68					
Thickness of Specimen, (in.)	1.00					
Degree of Saturation, (%)	43.5	135.1	43.5	137.0	44.4	135.5
Void Ratio	-	0.677	-	0.678	-	0.664

Lateral Displacement, d_h	0.36	(in.)
Displacement Rate, d_r	0.05	(in./min.)
Elapsed Time of Test, t_e	7.20	(min.)

Specimen :
- Undisturbed :
- Remolded : X
- Reconstituted : -

	PEAK	ULTIMATE
Cohesion,c (psf)	0	0
Friction Angle, ϕ	29	29

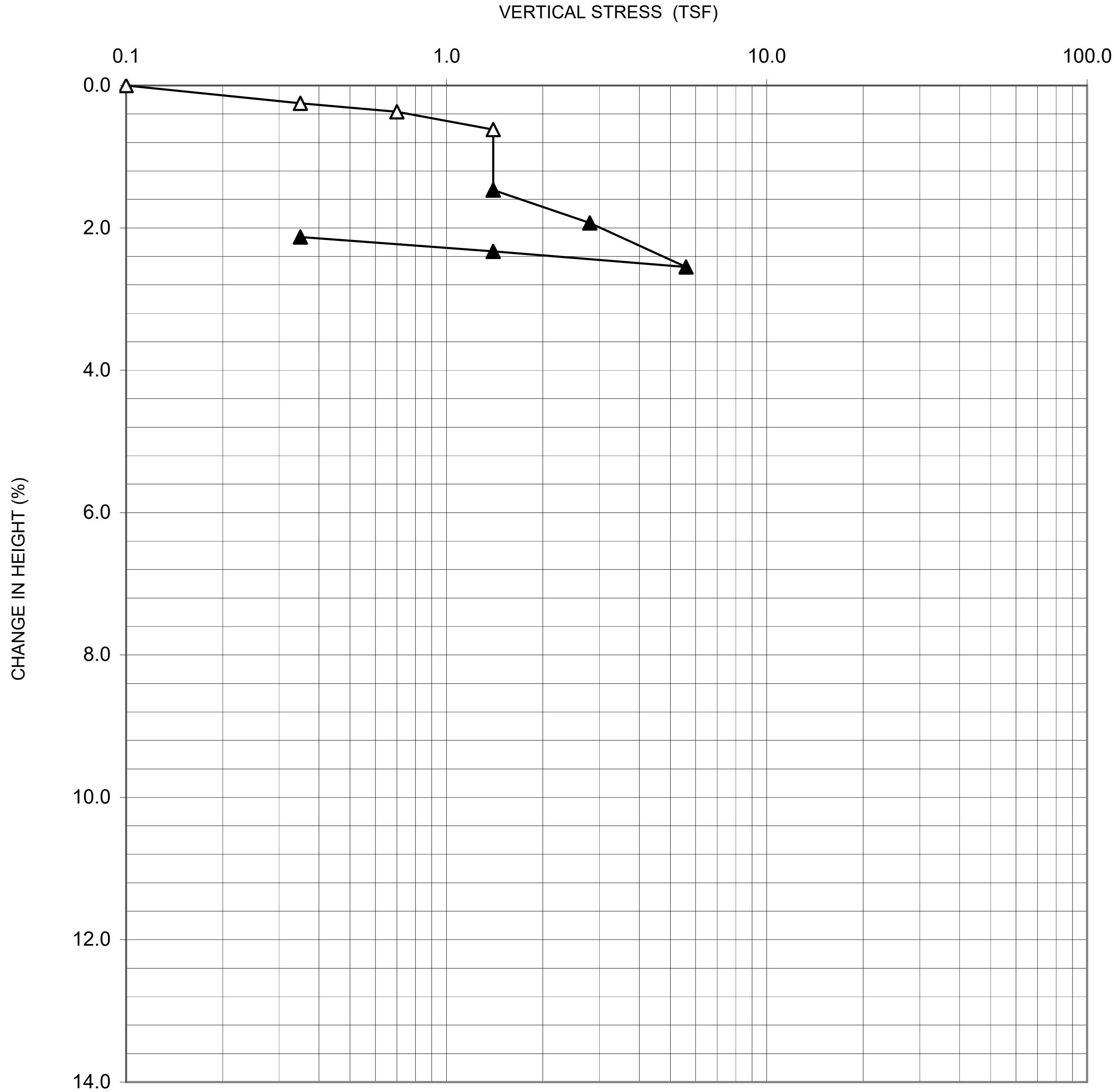
Remarks : SAMPLE REMOLDED TO 90% OF (126.5 PCF @ 11.0%)



KCG KLING Consulting Group, Inc.

8008 Sky Park Circle, Suite 250
Irvine, Ca. 92614
Tel: (949)797-6241 Fax: (949)797-6260

DIRECT SHEAR TEST
(ASTM D3080)



PROJECT NO.: 19042-00

SOIL DESCRIPTIONS: BROWN SILTY FINE SAND (SM)

BORING NO./LOCATION : B - 6

DEPTH / ELEV. : 5'

LIQUID LIMIT : -

SPECIFIC GRAVITY : 2.68 (Assumed)

PLASTIC LIMIT: -

REMARKS :

	SPECIMEN HEIGHT (INCHES)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	SATURATION (%)	VOID RATIO
INITIAL	1.0000	3.2	104.0	14.2	0.609
FINAL	0.9787	29.2	106.2	135.9	0.575

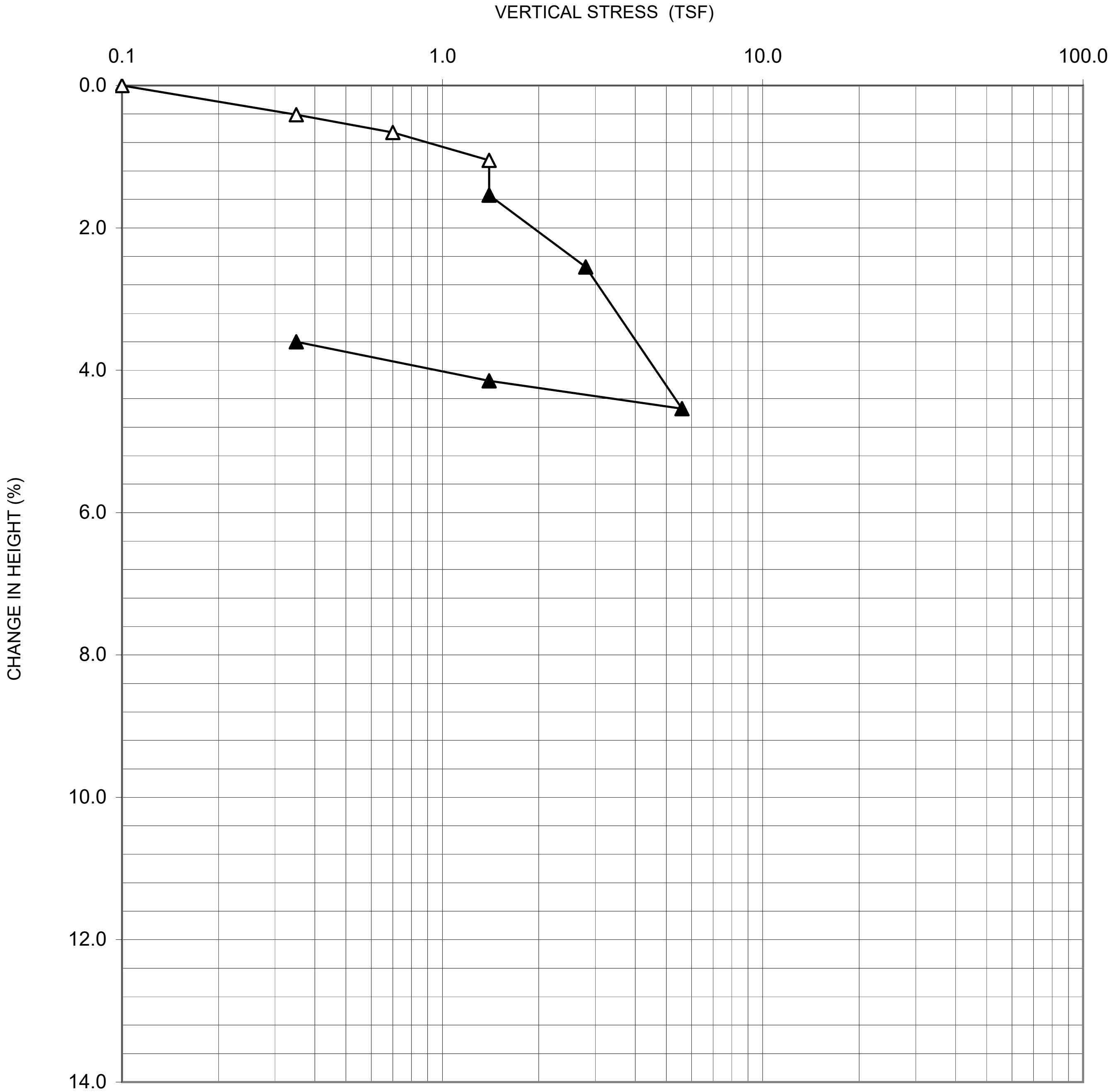
KCG KLING Consulting Group, Inc.

18008 Sky Park Circle, Suite 250

Irvine, Ca. 92614

Tel: (949)797-6241 Fax: (949)797-6260

CONSOLIDATION TEST CURVE



PROJECT NO.: 19042-00

SOIL DESCRIPTIONS: BROWN CLAYEY SAND (SC)

BORING NO./LOCATION : B - 15

DEPTH / ELEV. : 5'

LIQUID LIMIT : -

SPECIFIC GRAVITY : 2.68 (Assumed)

PLASTIC LIMIT: -

REMARKS :

	SPECIMEN HEIGHT (INCHES)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	SATURATION (%)	VOID RATIO
INITIAL	1.0000	6.2	111.1	33.1	0.505
FINAL	0.9640	19.4	115.2	115.2	0.451

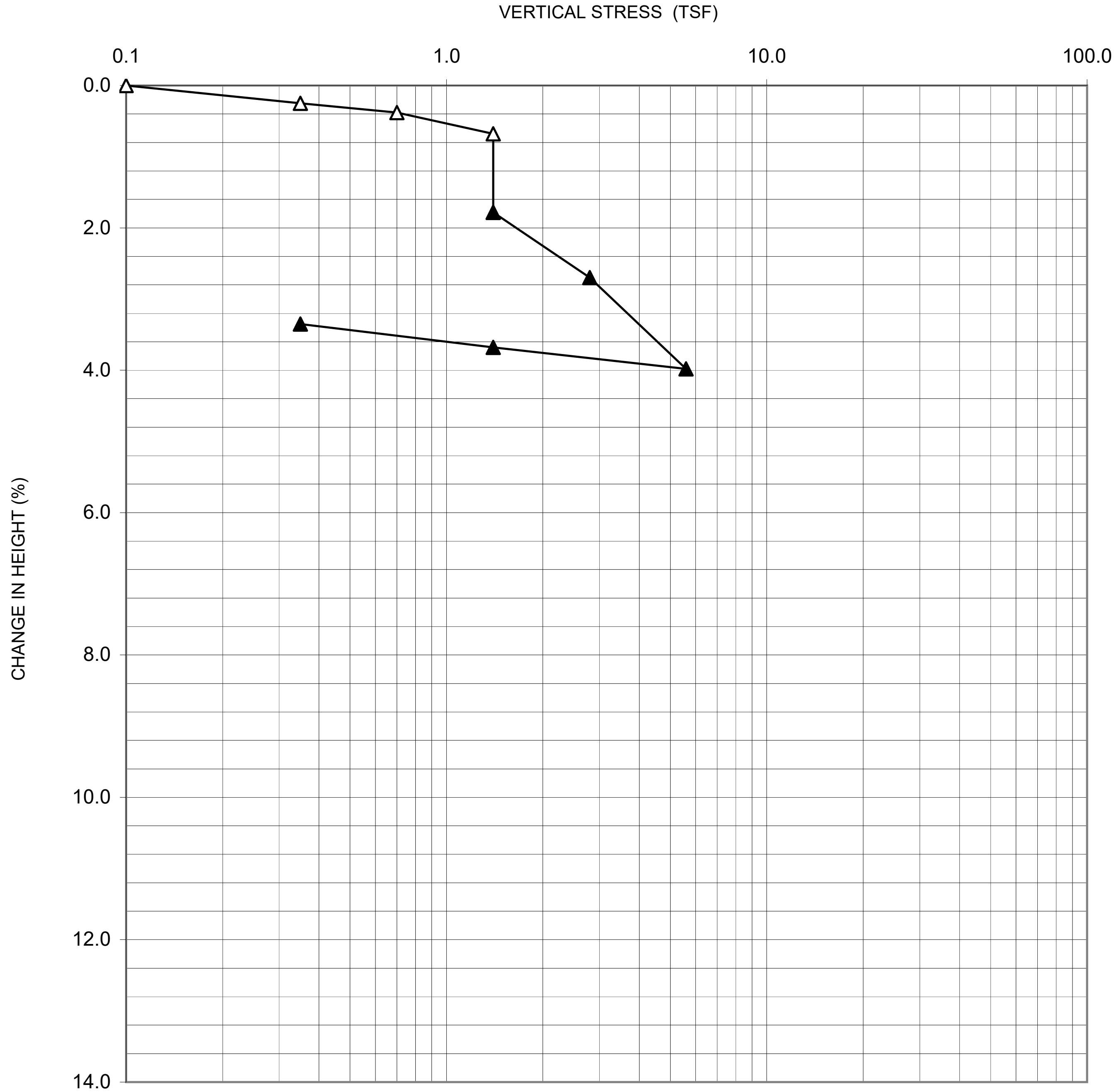
KCG KLING Consulting Group, Inc.

18008 Sky Park Circle, Suite 250

Irvine, Ca. 92614

Tel: (949)797-6241 Fax: (949)797-6260

CONSOLIDATION TEST CURVE



PROJECT NO.: 19042-00

SOIL DESCRIPTIONS: DK. BROWN SILTY FINE SAND (SM)

BORING NO./LOCATION : B - 17

DEPTH / ELEV. : 5'

LIQUID LIMIT : -

SPECIFIC GRAVITY : 2.68 (Assumed)

PLASTIC LIMIT: -

REMARKS :

	SPECIMEN HEIGHT (INCHES)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	SATURATION (%)	VOID RATIO
INITIAL	1.0000	3.6	107.6	17.4	0.555
FINAL	0.9665	22.7	111.2	121.0	0.503

KCG KLING Consulting Group, Inc.
18008 Sky Park Circle, Suite 250
Irvine, Ca. 92614
Tel: (949)797-6241 Fax: (949)797-6260

CONSOLIDATION TEST CURVE

PROJECT NAME :	ANGELUS BLOCK RIALTO	PROJECT NUMBER :	19042-00
TRACT NUMBER :		TESTED BY : RB	DATE : 3-Jan-19
LOT NUMBER :		SAMPLED BY: WP	DATE : 17-Dec-19
SAMPLE NO. :	1	LOCATION :	B - 5 @ 0 - 5'

SOIL DESCRIPTIONS / CLASSIFICATION : LT. BROWN SILTY SAND TR CLAY (SM)

TRIAL NUMBER		1	2	3	4
WET WT. OF SOIL + RING	(g)	607.17	614.22		
WEIGHT OF RING	(g)	204.43	204.43		
WET WEIGHT OF SOIL	(g)	402.74	409.79		
FACTOR		0.3030	0.3030		
WET DENSITY	(pcf)	122.0	124.2		
DRY DENSITY	(pcf)	113.0	114.1		
DEGREE OF SATURATION	(%)	44.0	49.9		

MOISTURE DETERMINATION

WET WEIGHT OF SOIL	(g)	309.38	307.22		
DRY WEIGHT OF SOIL	(g)	286.43	282.37		
MOISTURE CONTENT	(%)	8.0	8.8		

RACK NO. : 1

SURCHARGE : 144 psf

FINAL DENSITY & SATURATION

WET WT. + RING	(g)	
DRY WT. + RING	(g)	
MOISTURE CONTENT	(%)	
SAMPLE LENGTH	(cm)	
SAMPLE AREA	(cm^2)	
VOLUME	(cc)	
WT. OF RING	(g)	
DRY DENSITY	(pcf)	
SPEC.GRAVITY (assumed)		2.70
SATURATION	(%)	
% RETAINED ON #4 SIEVE		

DATE	TIME	ELAPSED TIME (min.)	DIAL READING (in.)	DEFLECTION (in.)
3-Jan	9:45		0.231	
3-Jan	1:00		0.259	
6-Jan	6:58		0.276	0.045

E. I.	45	SO_4	51	ppm

REMARKS :

KCG KLING Consulting Group, Inc.
18008 Sky Park Circle, Suite 250
Irvine, Ca. 92614
Tel: (949)797-6241 Fax: (949)797-6260

EXPANSION INDEX
(UBC 18-2)

PROJECT NAME :	ANGELUS BLOCK RIALTO	PROJECT NUMBER :	19042-00
TRACT NUMBER :		TESTED BY :	RB	DATE : 2-Jan-20
LOT NUMBER :		SAMPLED BY:	WP	DATE : 17-Dec-19
SAMPLE NO. :	1	LOCATION :	B - 17 @ 0 - 5'

SOIL DESCRIPTIONS / CLASSIFICATION : BROWN SILTY FINE SAND (SM)

TRIAL NUMBER		1	2	3	4
WET WT. OF SOIL + RING	(g)	575.89	614.09		
WEIGHT OF RING	(g)	204.43	204.43		
WET WEIGHT OF SOIL	(g)	371.46	409.66		
FACTOR		0.3030	0.3030		
WET DENSITY	(pcf)	112.6	124.1		
DRY DENSITY	(pcf)	108.9	114.3		
DEGREE OF SATURATION	(%)	16.5	49.0		

MOISTURE DETERMINATION

WET WEIGHT OF SOIL	(g)	306.19	302.85		
DRY WEIGHT OF SOIL	(g)	296.27	278.87		
MOISTURE CONTENT	(%)	3.3	8.6		

RACK NO. : 1

SURCHARGE : 144 psf

FINAL DENSITY & SATURATION

WET WT. + RING	(g)	
DRY WT. + RING	(g)	
MOISTURE CONTENT	(%)	
SAMPLE LENGTH	(cm)	
SAMPLE AREA	(cm^2)	
VOLUME	(cc)	
WT. OF RING	(g)	
DRY DENSITY	(pcf)	
SPEC.GRAVITY (assumed)		2.70
SATURATION	(%)	
% RETAINED ON #4 SIEVE		

DATE	TIME	ELAPSED TIME (min.)	DIAL READING (in.)	DEFLECTION (in.)
31-Dec	10:12		0.448	
31-Dec	11:30		0.448	
2-Jan	5:05		0.448	0.000
E. I.	0		SO_4 93	ppm

REMARKS :

KCG KLING Consulting Group, Inc.
18008 Sky Park Circle, Suite 250
Irvine, Ca. 92614
Tel: (949)797-6241 Fax: (949)797-6260

EXPANSION INDEX
(UBC 18-2)

LaBelle Marvin

R - VALUE DATA SHEET

PROJECT No. 45678
DATE: 1/3/2020

BORING NO. B-9 / Sample #1 @ 0'-5'
Angelus Block / Rialto, 12/17/2019
P.N. 19042-00

SAMPLE DESCRIPTION: Brown Fine Sand

R-VALUE TESTING DATA | CA TEST 301

	SPECIMEN ID		
	a	b	c
Mold ID Number	1	2	3
Water added, grams	63	72	57
Initial Test Water, %	10.5	11.4	9.9
Compact Gage Pressure,psi	350	350	350
Exudation Pressure, psi	336	206	692
Height Sample, Inches	2.51	2.52	2.52
Gross Weight Mold, grams	3050	3051	3052
Tare Weight Mold, grams	1954	1946	1958
Sample Wet Weight, grams	1096	1105	1094
Expansion, Inches x 10exp-4	10	6	17
Stability 2,000 lbs (160psi)	19 / 36	23 / 44	18 / 29
Turns Displacement	4.40	4.70	4.35
R-Value Uncorrected	66	58	72
R-Value Corrected	66	58	72
Dry Density, pcf	119.7	119.3	119.7

DESIGN CALCULATION DATA

Traffic Index Assumed:	4.0	4.0	4.0
G.E. by Stability	0.35	0.43	0.29
G. E. by Expansion	0.33	0.20	0.57

Equilibrium R-Value	**64** by EXUDATION	Examined & Checked: 1 /3/ 20
REMARKS:	Gf = 1.25 0.0% Retained on the 3/4" Sieve.	REGISTERED PROFESSIONAL ENGINEER STEVEN R. MARVIN C 30659 CIVIL STATE OF CALIFORNIA Steven R. Marvin, RCE 30659

The data above is based upon processing and testing samples as received from the field. Test procedures in accordance with latest revisions to Department of Transportation, State of California, Materials & Research Test Method No. 301.

R-VALUE GRAPHICAL PRESENTATION

LaBelle Marvin

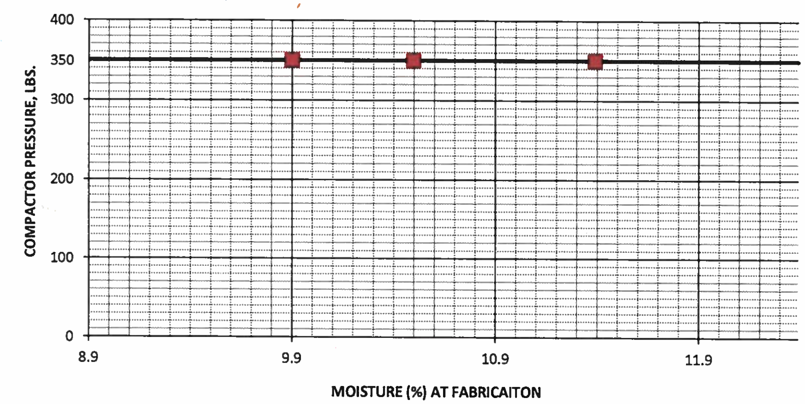
PROJECT NO. 45678

DATE: 1 /3/ 2020

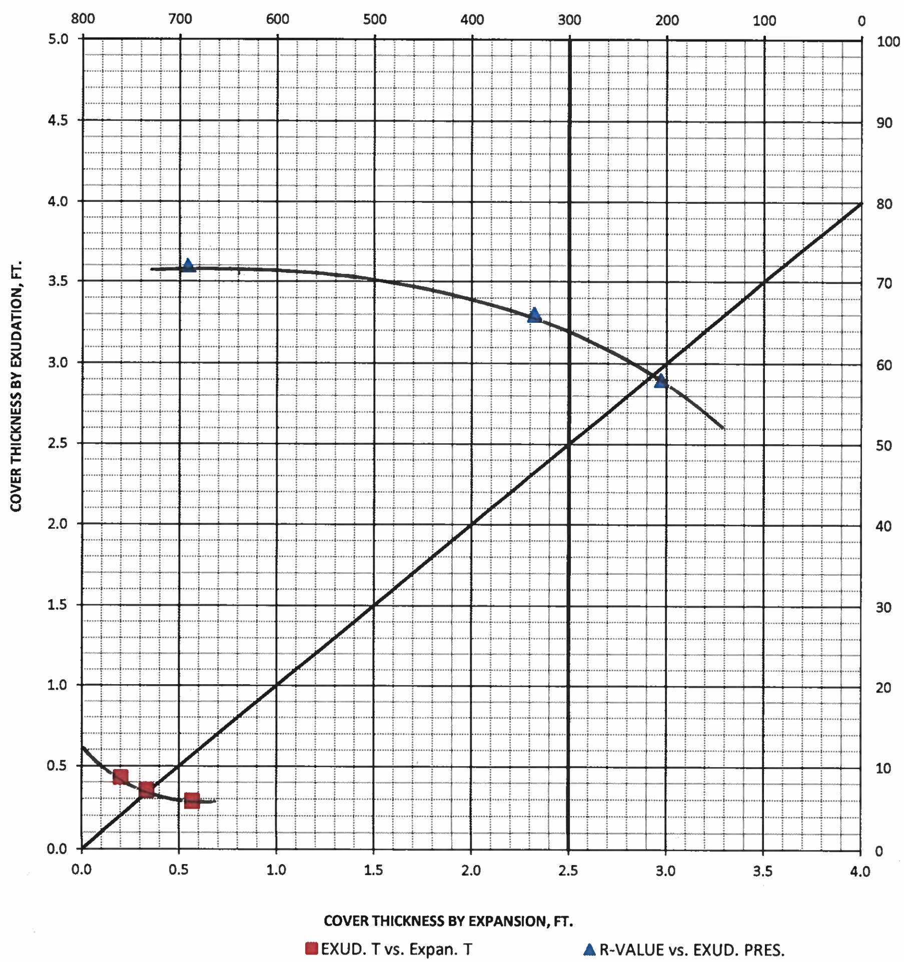
REMARKS:

BORING NO. B-9 / Sample #1 @ 0'-5'
Angelus Block / Rialto, 12/17/2019
P.N. 19042-00

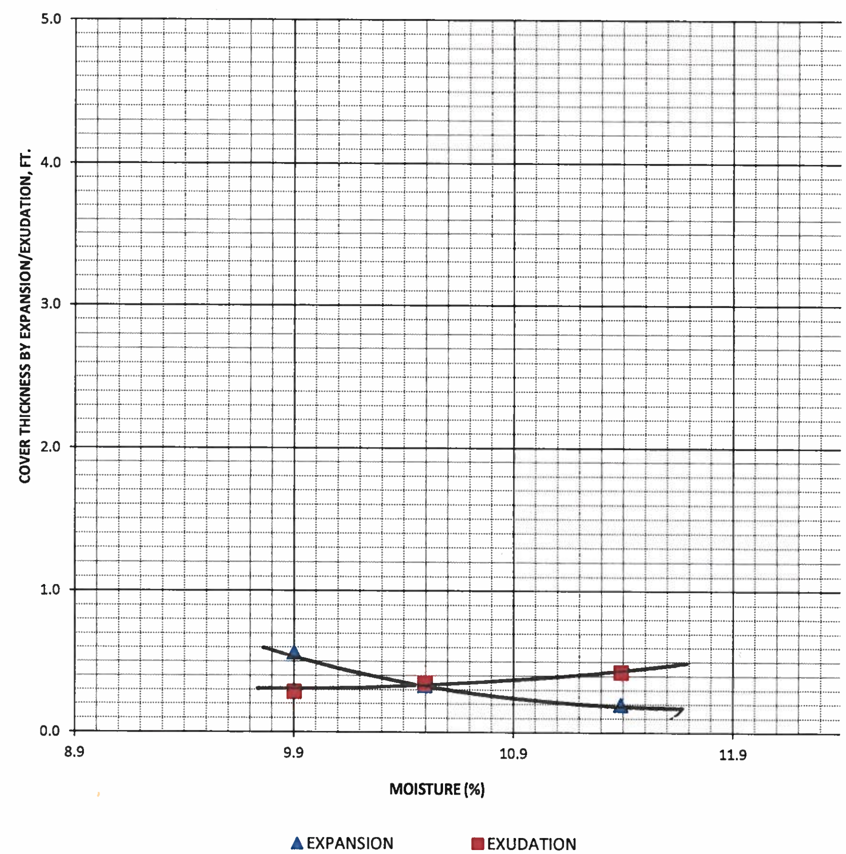
COMPACTOR PRESSURE vs MOISTURE %



COVER THICKNESS BY EXUDATION vs COVER THICKNESS BY EXPANSION



COVER THICKNESS vs MOISTURE %



PROJECT NAME : ANGELUS BLOCK RIALTO   CHECKED BY: ________   TESTED BY : RB

PROJECT NUMBER : 19042-00   SAMPLED BY: WP   DATE : 3-Jan-20

LOCATION	SOIL DESCRIPTION	SO_4 (PPM)	SO_4 (%)	DATE OF TEST
B - 5 @ 0 - 5'	LT. BR. SAND TR CLAY (SM)	51	0.0051	2-Jan-20
B - 14 @ 0 - 5'	BR. SILTY F. SAND W/ TR. OF CLAY	3	0.0003	3-Jan-20
B - 17 @ 0 - 5'	BR. SILTY FINE SAND (SM)	93	0.0093	3-Jan-20
B - 9 @ 0 - 5'	DK. BR. SILTY FINESAND(SM)	60	0.0060	7-Jan-20
			0	
			0	
			0	
			0	
			0	
			0	
			0	
			0	
			0	
			0	
			0	

REMARKS : ________________

KCG KLING Consulting Group, Inc.
18008 Sky Park Circle, Suite 250
Irvine, Ca. 92614
Tel: (949)797-6241 Fax: (949)797-6260

SOLUBLE SULFATE TEST

CA TEST 417 / AASHTO T290-94 (B)

APPENDIX C

LABORATORY TEST PROCEDURES

VISUAL CLASSIFICATION OF SOILS

As a part of the routine laboratory soil testing, the soil samples are visually classified in accordance with the Unified Soil Classification System by experienced laboratory technicians. If necessary, in order to verify the visual classification, selected samples are classified utilizing the results of Standard Classification tests performed in accordance with ASTM D2487.

MOISTURE CONTENT AND DRY DENSITY DETERMINATION

Moisture content and dry density determinations were performed on relatively undisturbed samples obtained during our field exploration. The field moisture content is obtained by methods described in ASTM D2216. The in-situ dry unit weight was computed using the net weight and volume of the relatively undisturbed samples. The results of these tests are presented on the borings logs in Appendix B.

MAXIMUM DENSITY TESTS

The maximum dry density and optimum moisture content of typical materials is determined in accordance with ASTM D1557 (five layers). The results of these tests are presented graphically as an attachment in this Appendix.

DIRECT SHEAR TESTS

Direct shear tests were performed in general accordance with ASTM D3080 on selected remolded and/or undisturbed samples that were pre-soaked for a minimum of 24 hours. The samples were then tested under various normal loads; a different specimen being used for each normal load. The samples were sheared in a motor driven, strain-controlled direct shear testing apparatus at a strain rate of 0.05 in. per minute. The results of this test are presented in the Laboratory Summary and graphically as an attachment in this Appendix.

CONSOLIDATION TESTS

Consolidation tests were performed in general accordance with ASTM D2435 on selected, relatively undisturbed, ring samples recovered from the exploratory excavations. Samples are placed in a consolidometer where increasing load increments are applied in geometric progression. The soil specimen is placed between porous stones that allow water to infiltrate and to flow of the soil sample. During the loading stages prior to the addition of water, the soil sample is sealed in order to prevent evaporation of soil water. The load increment where water was added is indicated on the consolidation pressure curves. The percent consolidation for each load cycle is recorded as the ratio of the amount of vertical compression to the original 1-inch height. The results of these tests are presented graphically as an attachment in this Appendix.

APPENDIX C

LABORATORY TEST PROCEDURES
(Continued)

EXPANSION INDEX TEST

The expansion potential of selected materials was evaluated by the Expansion Index Test, U.B.C. Standard No. 18-2. The specimen was molded under a given compactive energy and moisture content to achieve approximately 50 percent saturation. The prepared 1-inch thick by 4-inch diameter specimen was then loaded with a 144 psf surcharge and inundated with water until volumetric equilibrium is reached. The result of this test is presented in the Laboratory Summary.

SOLUBLE SULFATES

Soluble sulfate tests determined in general accordance with California Test Method No. 417 were also performed on representative samples collected during the field investigation. Soils with a sulfate concentration greater than 0.07% may be corrosive to metals; concentrations greater than 0.10% are considered potentially harmful to concrete and would require following the current ACI or C.B.C. for "moderate" or more severe sulfate exposure requirements. The results of this test are presented in the Laboratory Summary.

LABORATORY TEST SUMMARY

Expansion Index and Soluble Sulfate

Location	Soil Description	Expansion Index	Soluble Sulfate (%)
KB-5 @0’-5’	Light Brown Clayey Sand (SC)	45	0.0051
KB-9 @0-5’	Brown Silty Sand (SM)	n/a	0.0060
KB-14 @ 0-5’	Brown Silty Sand (SM)	n/a	0.0003
KB-17 @0’-5’	Brown Silty Sand (SM)	0	0.0093

Direct Shear

Location	**Soil Description**	**Cohesion**	**Friction angle**
KB-5 @ 5’	Brown Silty Sand (SM)	0 psf	29 degrees
KB-14@ 5’	Brown Silty Sand (SM)	50 psf	29 degrees

* Test also plotted graphically on the following tables.

R-VALUE

The suitability of selected soil samples for support of flexible pavement was evaluated by conducting stabilometer resistance (R-Value) testing. R-value testing was performed in accordance with California Standard Test Method No. 301. The results of this test are attached herein.

APPENDIX D

PERCOLATION TEST RESULTS

KLING Consulting Group, Inc.

Infiltration Test Data Sheet

Project: 11042-00
Date: December 18,2019

Test Hole No: KB-1/P-1
Hole Depth, D_T (inches): 78
Diameter (inches): 6
Soil Description: (SM)

Tested Infiltration Rate[1]
1.41 in/hr

Sandy Soil Criteria Test

Trial No.	Start Time	Stop Time	Time Interval (min.)	Initial Depth to Water (ft.)	Initial Depth to Water (in.)	Final Depth to Water (ft.)	Final Depth to Water (in.)	Change in Water Level (in.)	Great than or Equal to 6"? (Y/N)
1	9:07	9:32	25	1.52	18.25	3.29	39.50	21.25	Y
2	10:06	10:31	25	2.12	25.50	3.73	44.75	19.25	Y

Trial Readings

Trial No.	Start Time	Stop Time	Time Interval (min.)	Measured Initial Depth to Water (in.)	Initial Depth to Water (in.)	Measured Final Depth to Water (in.)	Final Depth to Water (in.)	Change in Water Level (in.)	Percolation Rate (min./in.)
1	12:24	12:34	10	46.00	46.00	55.25	55.25	9.25	1.08
2	12:40	12:50	10	43.50	43.50	52.00	52.00	8.50	1.18
3	12:55	1:05	10	38.00	38.00	44.75	44.75	6.75	1.48
4	1:10	1:20	10	37.25	37.25	43.50	43.50	6.25	1.60
5	1:24	1:34	10	32.25	32.25	38.00	38.00	5.75	1.74
6	1:35	1:45	10	38.25	38.25	44.25	44.25	6.00	1.67

Comments:

KCG KLING Consulting Group, Inc.

Infiltration Test Data Sheet

Project: 19042-00
Date: December 18, 2019

Test Hole No: KB-2A/P-2A
Hole Depth, D_T (inches): 120
Diameter (inches): 6
Soil Description: (SM)

Tested Infiltration Rate[1]
0.26 in/hr

Sandy Soil Criteria Test

Trial No.	Start Time	Stop Time	Time Interval (min.)	Initial Depth to Water (ft.)	Initial Depth to Water (in.)	Final Depth to Water (ft.)	Final Depth to Water (in.)	Change in Water Level (in.)	Great than or Equal to 6"? (Y/N)
1	9:09	9:34	25	3.69	44.25	4.31	51.75	7.50	Y
2	9:36	10:01	25	3.25	39.00	3.92	47.00	8.00	Y

Trial Readings

Trial No.	Start Time	Stop Time	Time Interval (min.)	Measured Initial Depth to Water (in.)	Initial Depth to Water (in.)	Measured Final Depth to Water (in.)	Final Depth to Water (in.)	Change in Water Level (in.)	Percolation Rate (min./in.)
1	12:20	12:30	10	48.00	48.00	52.50	52.50	4.50	2.22
2	12:36	12:46	10	53.00	53.00	56.50	56.50	3.50	2.86
3	12:50	1:00	10	57.00	57.00	59.25	59.25	2.25	4.44
4	1:03	1:13	10	37.00	37.00	39.75	39.75	2.75	3.64
5	1:15	1:25	10	40.00	40.00	41.75	41.75	1.75	5.71
6	1:25	1:35	10	41.75	41.75	44.00	44.00	2.25	4.44

Comments:

KLING Consulting Group, Inc.

Infiltration Test Data Sheet

Project: 19042-00
Date: December 18, 2019

Test Hole No: KB-3/P-3
Hole Depth, D_T (inches): 60
Diameter (inches): 6
Soil Description: (SM)

Tested Infiltration Rate[1]
0.70 in/hr

Sandy Soil Criteria Test

Trial No.	Start Time	Stop Time	Time Interval (min.)	Initial Depth to Water (ft.)	Initial Depth to Water (in.)	Final Depth to Water (ft.)	Final Depth to Water (in.)	Change in Water Level (in.)	Great than or Equal to 6"? (Y/N)
1	9:35	10:00	25	1.88	22.50	2.56	30.75	8.25	Y
2	10:06	10:31	25	2.38	28.50	3.10	37.25	8.75	Y

Trial Readings

Trial No.	Start Time	Stop Time	Time Interval (min.)	Measured Initial Depth to Water (in.)	Initial Depth to Water (in.)	Measured Final Depth to Water (in.)	Final Depth to Water (in.)	Change in Water Level (in.)	Percolation Rate (min./in.)
1	10:29	10:39	10	22.50	22.50	26.75	26.75	4.25	2.35
2	10:44	10:54	10	27.00	27.00	30.75	30.75	3.75	2.67
3	10:55	11:05	10	31.00	31.00	33.75	33.75	2.75	3.64
4	11:08	11:18	10	24.25	24.25	28.00	28.00	3.75	2.67
5	11:20	11:30	10	28.25	28.25	31.00	31.00	2.75	3.64
6	11:34	11:44	10	31.50	31.50	33.75	33.75	2.25	4.44

Comments:

KLING Consulting Group, Inc.

Infiltration Test Data Sheet

Project: 19042-00
Date: December 18, 2019

Test Hole No: KB-4/P-4
Hole Depth, D_T (inches): 180
Diameter (inches): 6
Soil Description: (SM)

Tested Infiltration Rate[1]
0.45 in/hr

Sandy Soil Criteria Test

Trial No.	Start Time	Stop Time	Time Interval (min.)	Initial Depth to Water (ft.)	Initial Depth to Water (in.)	Final Depth to Water (ft.)	Final Depth to Water (in.)	Change in Water Level (in.)	Great than or Equal to 6"? (Y/N)
1	10:30	11:15	25	3.54	42.50	4.90	59.00	16.50	Y
2	11:17	11:42	25	3.69	44.25	4.95	59.50	15.25	Y

Trial Readings

Trial No.	Start Time	Stop Time	Time Interval (min.)	Measured Initial Depth to Water (in.)	Initial Depth to Water (in.)	Measured Final Depth to Water (in.)	Final Depth to Water (in.)	Change in Water Level (in.)	Percolation Rate (min./in.)
1	10:31	10:41	10	84.00	84.00	92.25	92.25	8.25	1.21
2	10:42	10:52	10	92.25	92.25	99.25	99.25	7.00	1.43
3	10:54	11:04	10	99.50	99.50	107.50	107.50	8.00	1.25
4	11:10	11:20	10	80.00	80.00	86.75	86.75	6.75	1.48
5	11:21	11:31	10	86.75	86.75	92.75	92.75	6.00	1.67
6	11:34	11:44	10	43.25	43.25	50.00	50.00	6.75	1.48

Comments:

KLING Consulting Group, Inc.

Infiltration Test Data Sheet

Project: 19042-00
Date: December 18, 2019

Test Hole No: KB-5/P-5
Hole Depth, D_T (inches): 78
Diameter (inches): 6
Soil Description: (SM)

Tested Infiltration Rate[1]
0.57 in/hr

Sandy Soil Criteria Test

Trial No.	Start Time	Stop Time	Time Interval (min.)	Initial Depth to Water (ft.)	Initial Depth to Water (in.)	Final Depth to Water (ft.)	Final Depth to Water (in.)	Change in Water Level (in.)	Great than or Equal to 6"? (Y/N)
1	11:30	11:55	25	2.88	34.50	3.56	42.75	7.75	Y
2	11:58	12:23	25	3.00	36.00	3.65	43.75	7.25	Y

Trial Readings

Trial No.	Start Time	Stop Time	Time Interval (min.)	Measured Initial Depth to Water (in.)	Initial Depth to Water (in.)	Measured Final Depth to Water (in.)	Final Depth to Water (in.)	Change in Water Level (in.)	Percolation Rate (min./in.)
1	10:25	10:35	10	24.50	24.50	28.25	28.25	3.75	2.67
2	1:57	2:07	10	28.25	28.25	32.50	32.50	4.25	2.35
3	2:10	2:20	10	35.00	35.00	39.50	39.50	4.50	2.22
4	2:22	2:32	10	39.50	39.50	42.25	42.25	2.75	3.64
5	2:35	2:45	10	31.00	31.00	34.50	34.50	3.50	2.86
6	2:46	2:56	10	34.50	34.50	37.25	37.25	2.75	3.64

Comments:

KCG KLING Consulting Group, Inc.

Infiltration Test Data Sheet

Project: 19042-00
Date: December 18, 2019

Test Hole No: KB-6/P-6
Hole Depth, D_T (inches): 198
Diameter (inches): 6
Soil Description: (SM)

Tested Infiltration Rate[1]
1.60 in/hr

Sandy Soil Criteria Test

Trial No.	Start Time	Stop Time	Time Interval (min.)	Initial Depth to Water (ft.)	Initial Depth to Water (in.)	Final Depth to Water (ft.)	Final Depth to Water (in.)	Change in Water Level (in.)	Great than or Equal to 6"? (Y/N)
1	11:40	12:05	25	6.13	73.50	8.50	102.00	28.50	Y
2	12:10	12:35	25	6.44	77.25	8.80	105.50	28.25	Y

Trial Readings

Trial No.	Start Time	Stop Time	Time Interval (min.)	Measured Initial Depth to Water (in.)	Initial Depth to Water (in.)	Measured Final Depth to Water (in.)	Final Depth to Water (in.)	Change in Water Level (in.)	Percolation Rate (min./in.)
1	10:40	10:50	10	79.00	79.00	95.75	95.75	16.75	0.60
2	11:00	11:10	10	100.25	100.25	116.00	116.00	15.75	0.63
3	11:18	11:28	10	85.50	85.50	101.75	101.75	16.25	0.62
4	11:31	11:41	10	103.25	103.25	118.75	118.75	15.50	0.65
5	11:42	11:52	10	90.25	90.25	105.50	105.50	15.25	0.66
6	11:53	12:03	10	106.00	106.00	121.25	121.25	15.25	0.66

Comments:

KCG KLING Consulting Group, Inc.

Infiltration Test Data Sheet

Project: 19042-00
Date: December 18, 2019

Test Hole No: KB-7/P-7
Hole Depth, D_T (inches): 60
Diameter (inches): 6
Soil Description: (SM)

Tested Infiltration Rate[1]
1.98 in/hr

Sandy Soil Criteria Test									
Trial No.	Start Time	Stop Time	Time Interval (min.)	Initial Depth to Water (ft.)	Initial Depth to Water (in.)	Final Depth to Water (ft.)	Final Depth to Water (in.)	Change in Water Level (in.)	Great than or Equal to 6"? (Y/N)
1	11:53	12:18	25	1.88	22.50	2.90	34.75	12.25	Y
2	12:20	12:45	25	2.38	28.50	3.31	39.75	11.25	Y

Trial Readings									
Trial No.	Start Time	Stop Time	Time Interval (min.)	Measured Initial Depth to Water (in.)	Initial Depth to Water (in.)	Measured Final Depth to Water (in.)	Final Depth to Water (in.)	Change in Water Level (in.)	Percolation Rate (min./in.)
1	1:41	1:51	10	19.50	19.50	26.25	26.25	6.75	1.48
2	1:52	2:02	10	26.50	26.50	32.25	32.25	5.75	1.74
3	2:05	2:15	10	33.00	33.00	37.25	37.25	4.25	2.35
4	2:20	2:30	10	22.25	22.25	28.25	28.25	6.00	1.67
5	2:30	2:40	10	28.25	28.25	33.75	33.75	5.50	1.82
6	2:46	2:56	10	33.75	33.75	39.25	39.25	5.50	1.82

Comments:

KLING Consulting Group, Inc.

Infiltration Test Data Sheet

Project: 19042-00
Date: December 18, 2019

Test Hole No: KB-8/P-8
Hole Depth, D_T (inches): 180
Diameter (inches): 6
Soil Description: (SM)

Tested Infiltration Rate[1]
1.43 in/hr

Sandy Soil Criteria Test

Trial No.	Start Time	Stop Time	Time Interval (min.)	Initial Depth to Water (ft.)	Initial Depth to Water (in.)	Final Depth to Water (ft.)	Final Depth to Water (in.)	Change in Water Level (in.)	Great than or Equal to 6"? (Y/N)
1	12:05	12:30	25	4.67	56.00	7.35	88.28	32.25	Y
2	8:16	8:41	25	5.13	61.50	7.52	90.25	28.75	Y

Trial Readings

Trial No.	Start Time	Stop Time	Time Interval (min.)	Measured Initial Depth to Water (in.)	Initial Depth to Water (in.)	Measured Final Depth to Water (in.)	Final Depth to Water (in.)	Change in Water Level (in.)	Percolation Rate (min./in.)
1	1:44	1:54	10	54.25	54.25	70.00	70.00	15.75	0.63
2	1:57	2:07	10	70.00	70.00	86.25	86.25	16.25	0.62
3	2:10	2:20	10	87.00	87.00	101.75	101.75	14.75	0.68
4	2:22	2:32	10	102.00	102.00	116.25	116.25	14.25	0.70
5	2:35	2:45	10	67.75	67.75	81.50	81.50	13.75	0.73
6	2:46	2:56	10	81.50	81.50	96.25	96.25	14.75	0.68

Comments:

APPENDIX E

GENERAL EARTHWORK AND GRADING GUIDELINES

APPENDIX E

GENERAL EARTHWORK AND GRADING SPECIFICATIONS

1.0 GENERAL INTENT

These specifications present general procedures and requirements for grading and earthwork as shown on the project grading plans, including preparation of areas to be filled, placement of fill, installation of subsurface drainage, and excavations. The recommendations contained in the geotechnical report(s) are a part of the earthwork and grading specifications and shall supersede the provisions contained hereinafter in the case of conflict. Evaluations performed by the geotechnical consultant during the course of grading may result in new specifications or recommendations in addition to those contained in the geotechnical report(s).

2.0 EARTHWORK OBSERVATION AND TESTING

Prior to the commencement of grading, a qualified geotechnical consultant (soils engineer and engineering geologist, and their representatives) shall be employed for the purpose of observing earthwork procedures and testing the fills for conformance with the recommendations of the geotechnical report and these specifications. It will be necessary that the geotechnical consultant provide adequate testing and observation so that he may determine that the work was accomplished as specified. If conditions exposed during grading differ significantly from those interpreted during the preliminary design investigation, the geotechnical consultant shall inform the client, recommend appropriate changes in the geotechnical design to account for the observed conditions, and notify City or County grading authorities, as necessary. It shall be the responsibility of the contractor to assist the geotechnical consultant and keep him apprised of work schedules and changes so that he may schedule his personnel accordingly.

The Project Geotechnical Consultant shall observe processing, moisture conditioning, and compaction of fill and subgrade materials. Testing of compacted fill in representative locations shall be performed by the Project Geotechnical Consultant's field representative. Daily reports and test results shall be provided to the client representative on a regular and frequent basis. Maximum dry density tests used to determine the degree of compaction and optimum moisture content shall be performed in accordance with the American Society for Testing and Materials test method ASTM D1557.

It shall be the sole responsibility of the contractor to provide adequate equipment and methods to accomplish the work in accordance with the geotechnical report(s) applicable grading codes and project grading plans. If, in the opinion of the geotechnical consultant, unsatisfactory conditions, such as questionable soil, poor moisture condition, inadequate compaction, adverse weather, etc., are resulting in the quality of work less than required in these specifications, the geotechnical consultant will be empowered to reject the work and recommend that construction be stopped until the conditions are rectified.

APPENDIX E

GENERAL EARTHWORK AND GRADING SPECIFICATIONS (Continued)

3.0 PREPARATION OF AREA TO BE FILLED

3.1 Clearing and Grubbing

All brush, vegetation, trash, debris and other deleterious material shall be removed from fill areas and disposed of off site. Vegetation cleared from the site shall not be placed within engineered compacted fill areas.

3.2 Processing

The existing ground which is determined to be satisfactory for support of fill shall be scarified to a minimum depth of six (6) inches. Existing ground which is not satisfactory shall be overexcavated as specified in the following section. Scarification shall continue until the soils are broken down and free of large clay lumps or clods and until the working surface is reasonably uniform and free of uneven features which would inhibit uniform compaction.

3.3 Overexcavation

Soft, dry, spongy, highly fractured or otherwise unsuitable ground, extending to such a depth that surface processing cannot adequately improve the condition, shall be overexcavated to firm ground, and verified by the project geotechnical consultant.

3.4 Moisture Conditioning

Overexcavated and processed soils shall be watered, dried-back, blended, and/or mixed as required to attain a uniform moisture content near optimum.

3.5 Recompaction

Overexcavated and processed soils which have been properly mixed and moisture-conditioned shall be recompacted to a minimum relative compaction of 90 percent, ASTM D1557.

3.6 Evaluation of Areas to Receive Fill

All areas to receive fill, including processed areas, removal areas and toe-of-fill benches shall be observed, tested, and/or mapped by the geotechnical consultant prior to fill placement. A written evaluation of the area to be filled shall be obtained by the Contractor prior to placement of fill.

APPENDIX E

GENERAL EARTHWORK AND GRADING SPECIFICATIONS (Continued)

4.0 FILL MATERIAL

4.1 General

Material to be placed as fill shall be free of roots, grasses, branches, wood or other organic matter and other deleterious materials, and shall be tested by the geotechnical consultant prior to use as fill. Soils of poor gradation, expansion, or strength characteristics shall be placed in areas designated by the geotechnical consultant or shall be mixed with other soils to serve as satisfactory fill material.

4.2 Oversize Material

Oversize material defined as rock, or other irreducible material with a maximum dimension greater than 12 inches, shall not be buried or placed in fills, unless the location, materials, and disposal methods are specifically recommended by the geotechnical consultant. Oversized disposal operations shall be such that nesting of oversize material does not occur, and such that the oversize material is completely surrounded by compacted or densified fill. Oversize material shall not be placed within 10 feet vertically of finish grade or construction, unless specifically recommended by the geotechnical consultant.

4.3 Import

If importing of fill material is required for grading, the import material shall meet the requirements of Section 4.1. Samples of import soils shall be provided for testing a minimum of 48 hours before the import materials are brought on site.

5.0 FILL PLACEMENT AND COMPACTION

5.1 Fill Lifts

Fill material shall be placed in prepared areas in near-horizontal layers not exceeding 8 inches in loose thickness. Each layer shall be spread evenly and shall be thoroughly mixed during spreading to attain uniformity of material and moisture in each layer.

APPENDIX E

GENERAL EARTHWORK AND GRADING SPECIFICATIONS (Continued)

5.2 Fill Moisture

Fill layers at a moisture content less than optimum shall be watered and mixed, and wet fill layers shall be aerated by scarification or shall be blended with drier material. Moisture-conditioning and mixing of fill layers shall continue until the fill material is at a uniformly processed at a minimum of 125 percent of the optimum moisture content.

5.3 Fill Compaction

After each layer has been evenly spread, moisture-conditioned, mixed, and shall be uniformly compacted to not less than 90 percent of the maximum dry density at a minimum of 125 percent of the optimum moisture content. Compaction equipment shall be adequately sized and shall be either specifically designed for soil compaction or of proven reliability, to efficiently achieve the specified degree of compaction.

5.4 Compaction Testing

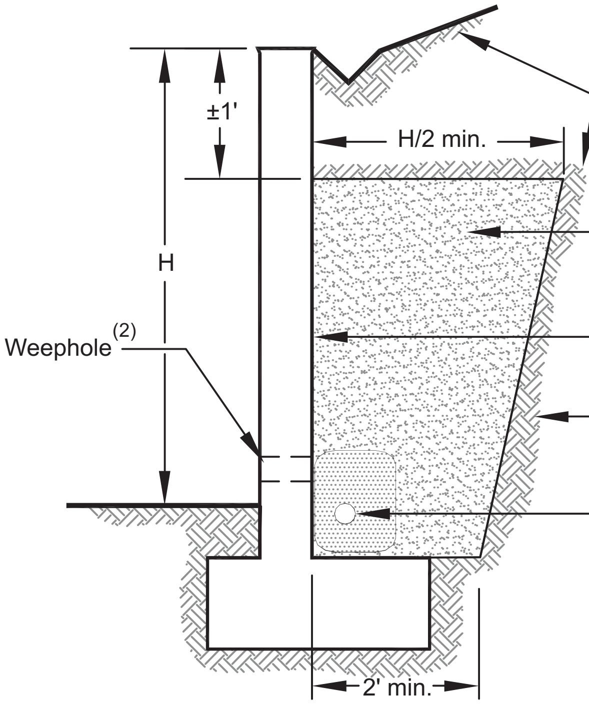
Field tests to check the fill moisture and degree of compaction will be performed by the geotechnical consultant. The location and frequency of tests shall be at the geotechnical consultant's discretion. In general, the tests will be taken at an interval not exceeding 2 feet in vertical elevation and/or 1,000 cubic yards of fill placed.

6.0 EXCAVATION

Excavation and cut slopes will be geologically mapped and examined during grading. Sufficient time shall be allowed by the contractor to permit geologic mapping of excavation bottoms and cut slopes. If directed by the geotechnical consultant, further excavation or overexcavation and refilling of cut areas shall be performed, and/or remedial grading of cut slopes. All fill-over-cut slopes are to be graded, unless otherwise stated, shall be constructed as a fill slope with the use of minimum width stabilization fills, as necessary.

Case 1

SELECT (CLEAN SAND) BACKFILL CONDITION

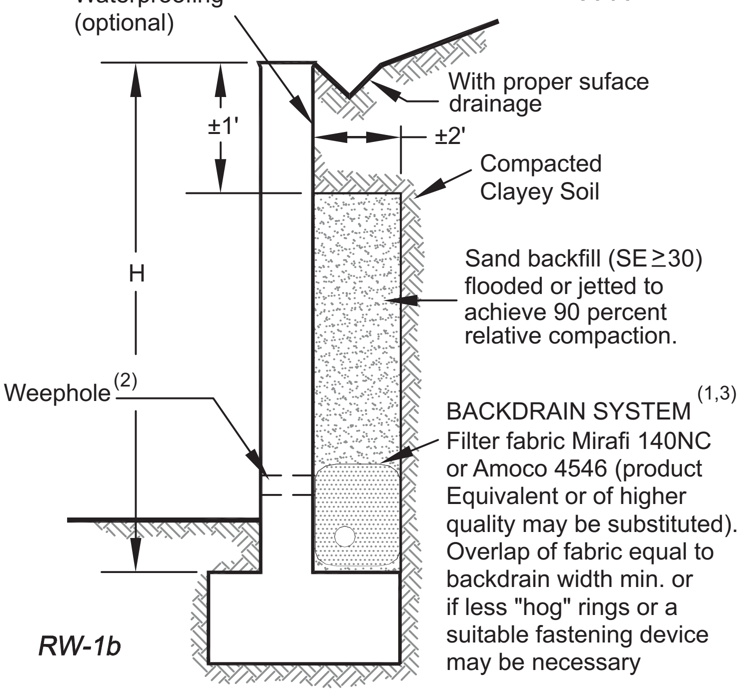


RW-1a

Case 2

NATIVE BACKFILL CONDITION*

* Note: An increase in Earth Pressure Parameters may be required.



RW-1b

Note:
It should be understood that the purpose of the retaining wall backdrain system is to reduce the potential for hydrostatic pressure buildup behind the wall. The backdrain system is not intended to be a means of waterproofing.

NOTES

1. For walls 4 feet in height, or less, open head joints (weep areas) @32 inches on center in the first course above adjacent finished grade or provide at a max. of 25 feet on center, 2 inch diameter weep holes. In lieu of weep holes, Schedule 40 PVC, 3/4 inch crushed gravel with filter fabric may be utilized. Walls over 4 feet in height see note 2.

2. Open head joints (weep areas) are not acceptable for walls over 4 feet in height, through pipes are required. Open head joints are recommended along with perforated pipe except where nuisance water cannot be tolerated. Where nuisance water is not acceptable, install an appropriate waterproofing material and use only the perforated pipe with outlets @ 100 foot intervals max., to suitable discharge facilities.

3. 1 cubic foot per feet minimum (or as necessary to cover weep areas) 3/4 inch open graded crushed gravel, wrapped in filter fabric (type as indicated) with 4 inch diameter perforated pipe (perforations per ASTM F758, pointed down) PVC Schedule 40 ASTM D1785 (product equivalent or of increased quality may be substituted), joints are to be glued with the appropriate adhesive, drained at a slope of 1% minimum.

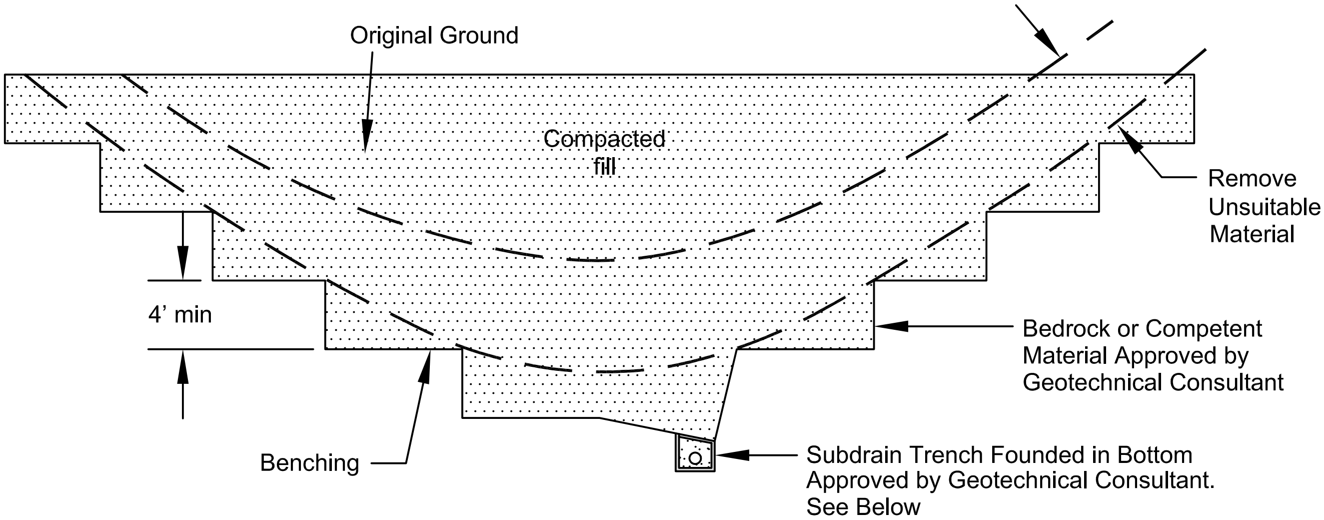
INFORMATION DEPICTED ON THIS DETAIL IS FOR TYPICAL CONDITIONS AND ARE SUBJECT TO CHANGE BY THE GEOTECHNICAL CONSULTANT.

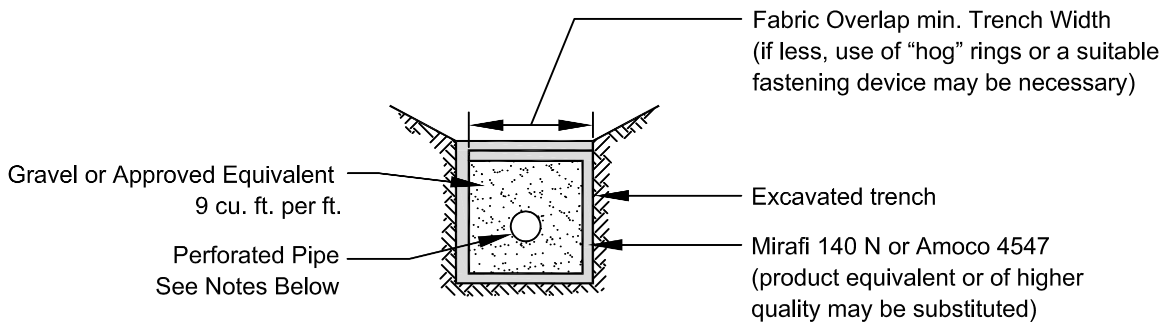
KCG KLING Consulting Group, Inc.

REV. 9/11

RETAINING WALL DETAIL
RW-1

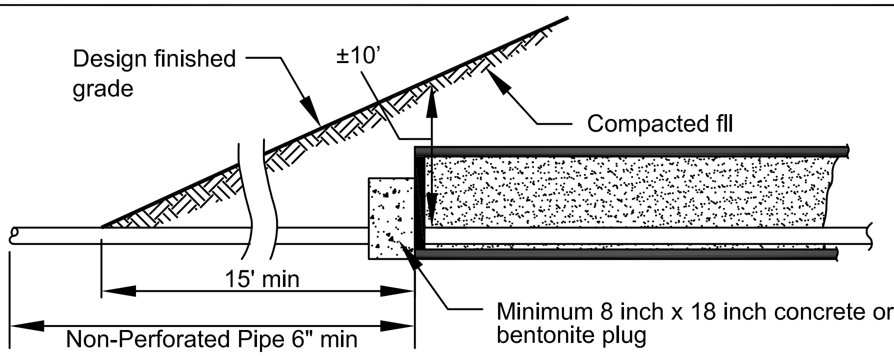
\\Zkfile\snap\Masters\Standard Grading Details_revised_07-08.dwg





SUBDRAIN

Perforated Pipe and Gravel
Gravel Wrapped in Filter Fabric



CANYON SUBDRAIN TERMINAL

SUBDRAIN INSTALLATION: Subdrain pipe shall be installed with perforations down. Pipe diameter shall increase as length of subdrain increases as follows: up to 600 ft. - 6" pipe; 600ft. To 1200 ft. - 8" pipe; greater than 1200 ft. as evaluated and approved by Geotechnical Consultant. Pipe joint bells should point upstream and be glued with the appropriate adhesive.

SUBDRAIN TYPE: Subdrain pipe type shall be PVC Schedule 40* for fills of less than 100 ft., and PVC Schedule 80* for fills over 100 ft., ASTM D1785 (*product equivalent or of increased quality may be substituted). Perforations shall conform to ASTM F758. Connecting elements shall consist of materials of equal quality compatible to the subdrain pipe.

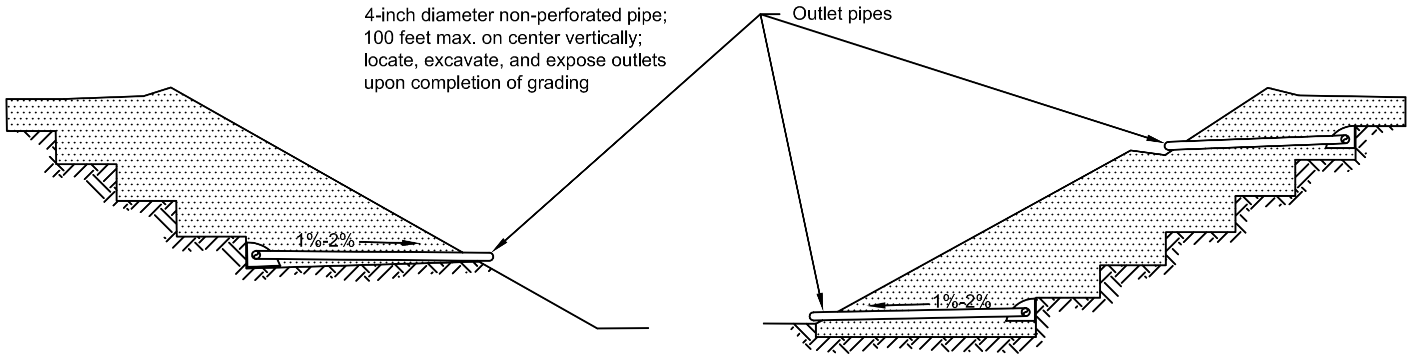
INFORMATION DEPICTED ON THIS DETAIL IS FOR TYPICAL CONDITIONS AND ARE SUBJECT TO CHANGE BY THE GEOTECHNICAL CONSULTANT.

KCG KLING Consultanting Group, Inc.

CANYON FILL AND SUBDRAIN DETAIL

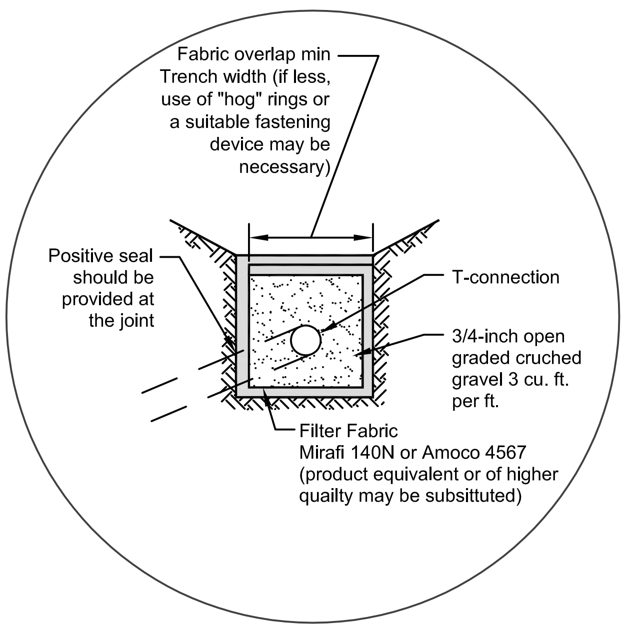
GD-1

REVISION DATE: 10/01

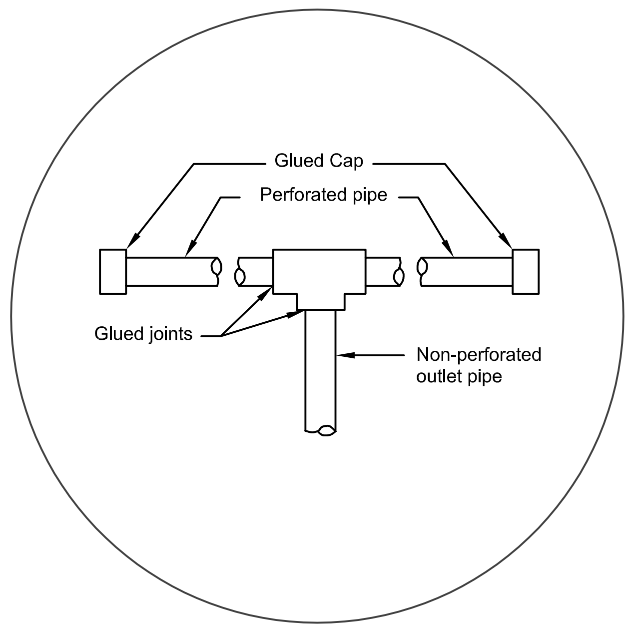


TYPICAL FILL OVER
CUT KEYWAY SUBDRAIN

TYPICAL BUTTRESS AND
STABILIZATION FILL SUBDRAINS



GRAVEL WITH
FILTER FABRIC



T-CONNECTION

NOTES:

1. Trench for outlet pipes to be backfilled with on-site soil.

2. **SUBDRAIN INSTALLATION:** Subdrain pipe shall be installed with perforations down or non-perforated pipe shall be used at locations indicated by the Geotechnical Consultant.

3. **SUBDRAIN TYPE:** Subdrain type shall be PVC Schedule 40 ASTM D1785 (equivalent or of increased quality may be substituted), for fills of less than 30 feet and PVC Schedule 80, ASTM D1785 (product equivalent or of increased quality may be substituted). Connecting elements shall consist of materials of equal quality compacted to the subdrain pipe. Pipe joint bells are to point upstream and be glued with the appropriate adhesive. Connecting elements shall consist of materials of equal quality compatible to the subdrain pipe.

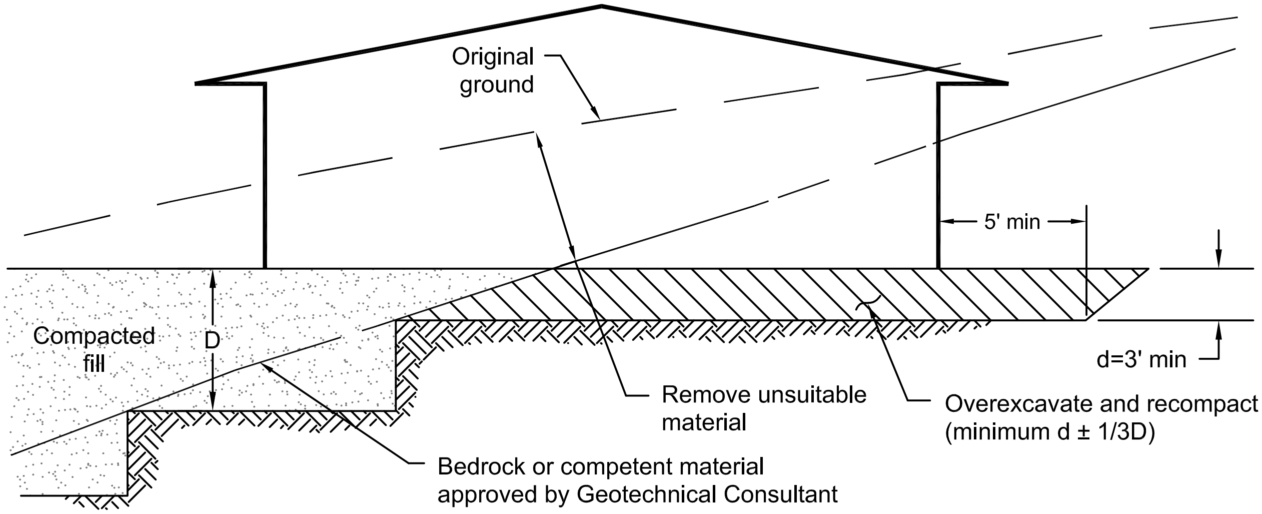
INFORMATION DEPICTED ON THIS DETAIL IS FOR TYPICAL CONDITIONS AND ARE SUBJECT TO CHANGE BY THE GEOTECHNICAL CONSULTANT.

KCG KLING Consultanting Group, Inc.

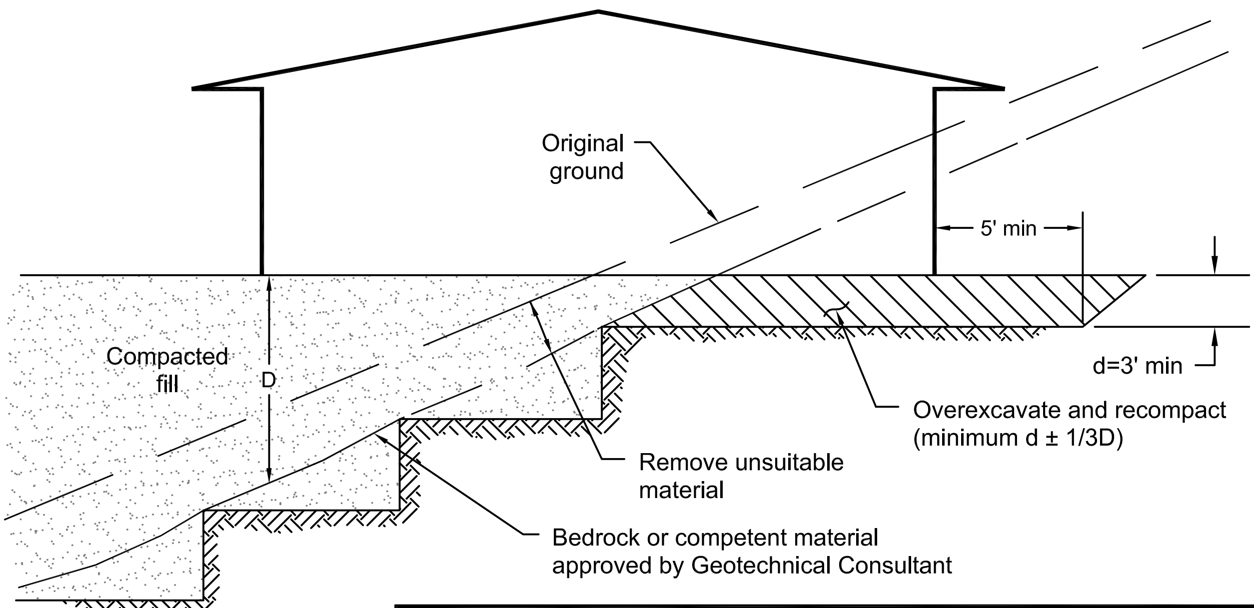
KEYWAY AND SIDEHILL SUBDRAIN DETAILS
GD-2

REVISION DATE: 10/01

CUT LOT
(Removal of unsuitable material may create a Transition Lot)



CUT FILL LOT (Transition)
AND FILL OVER STEEP TERRAIN



NOTES

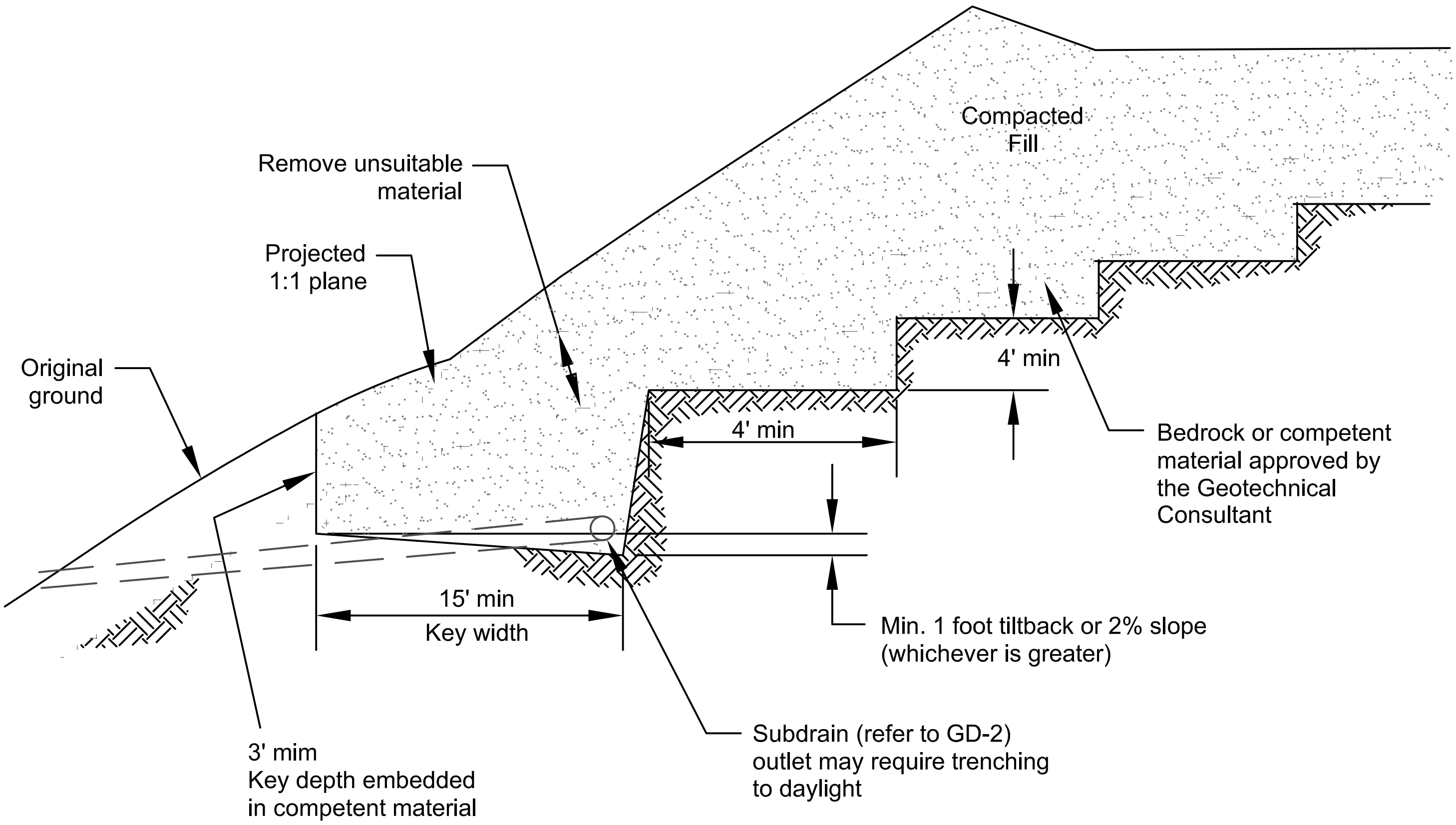
1. Depth of overexcavation to be approved by the Geotechnical Consultant.
2. "d" is equal to 3 feet minimum (or as approved by the Geotechnical Consultant) from finish pad grade when not involved with steep fill/transition lots.
3. STEEP FILL/TRANSITION LOTS:
   D = Deepest fill on the pad, in feet
   d = D/3 (feet) required for overexcavation of same pad.
   For example:
   D = 15 feet therefore d = 15 feet/3; d = 5 feet
4. "D" to be measured at the property line when the precise structure location

INFORMATION DEPICTED ON THIS DETAIL IS FOR TYPICAL CONDITIONS AND ARE SUBJECT TO CHANGE BY THE GEOTECHNICAL CONSULTANT.

KCG KLING Consultanting Group, Inc.

TRANSITION LOT DETAILS
GD-3

REVISION DATE: 10/01



NOTES

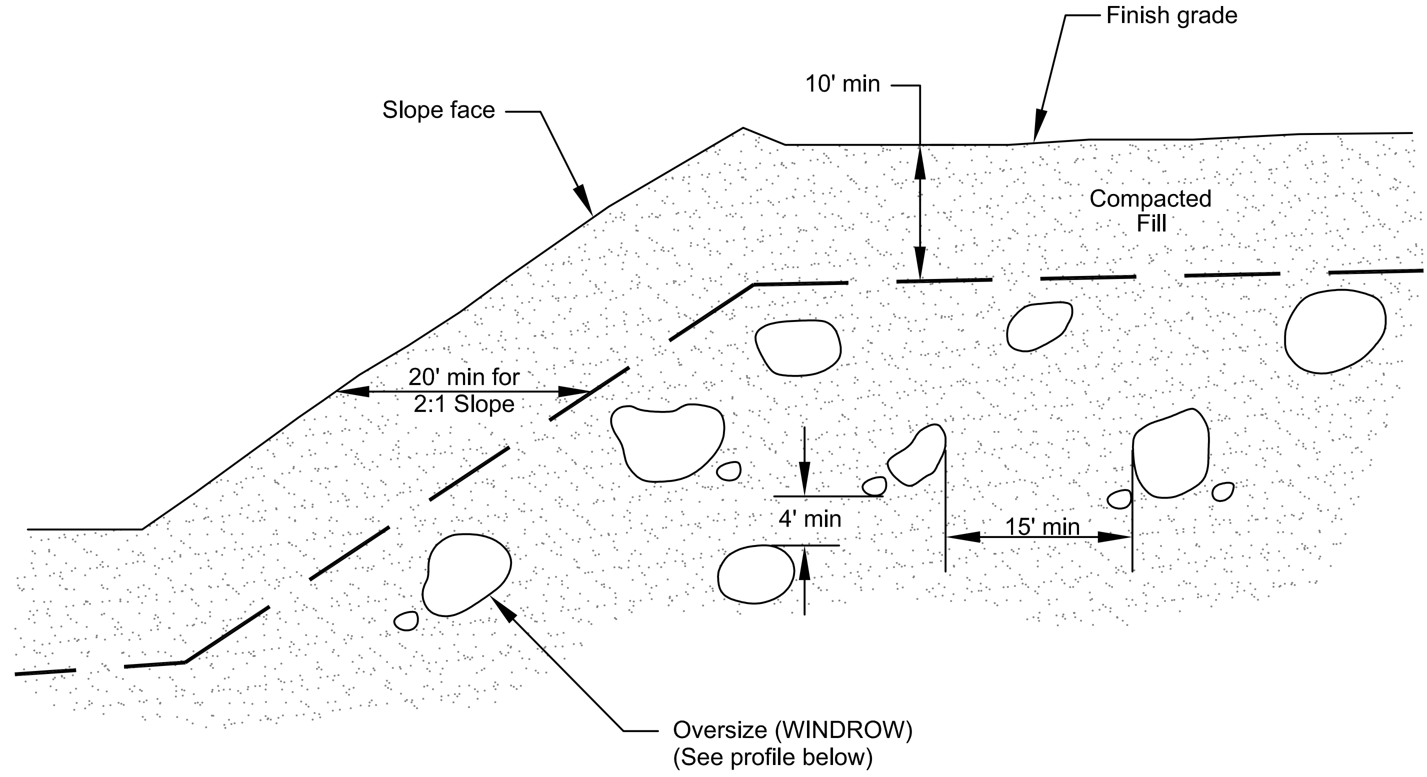
Benching shall be required when natural slopes have a slope ratio of 5:1 or greater. When the natural slope approaches or exceeds the design slope ratio, special recommendations will be provided by the Geotechnical Consultant. In the case of a design cut pad, over-excavation and recompaction may be required (refer to GD-3).

INFORMATION DEPICTED ON THIS DETAIL IS FOR TYPICAL CONDITIONS AND ARE SUBJECT TO CHANGE BY THE GEOTECHNICAL CONSULTANT.

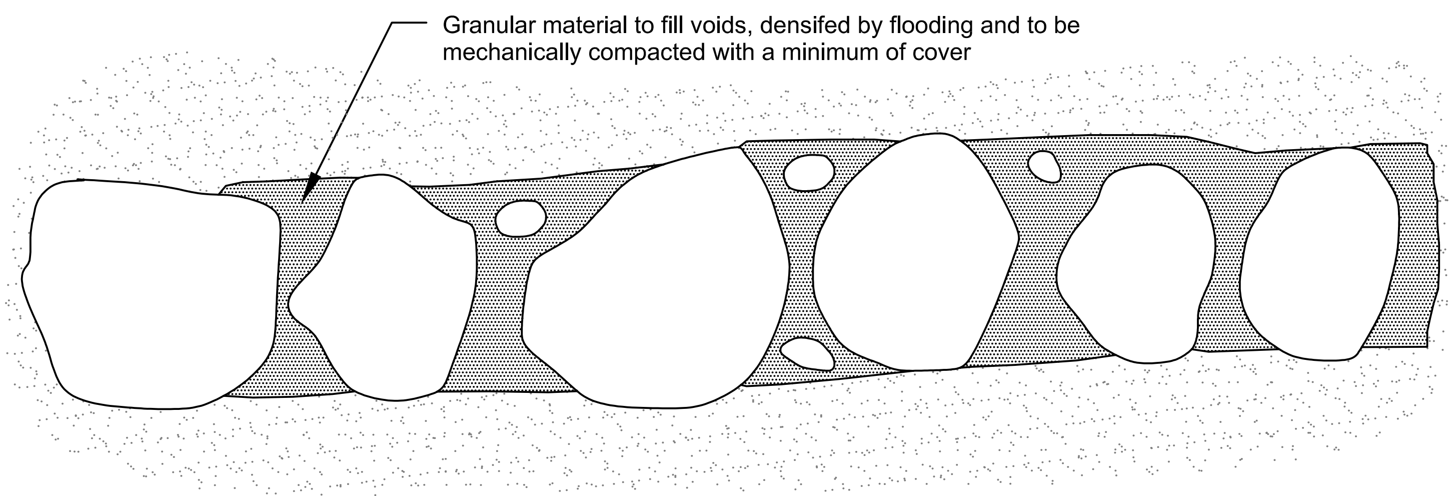
KCG KLING Consultanting Group, Inc.

FILL ABOVE NATURAL SLOPE DETAIL
GD-4

REVISION DATE: 10/01



PROFILE ALONG WINDROW



NOTES

Oversized material is defined as rock or other irreducible material with any dimension greater than 12 inches. Granular materials shall consist of sandy or gravely soils with a sand equivalent of 30 or greater, but not to exceed 1 inch in diameter or as approved by the Geotechnical Consultant.

INFORMATION DEPICTED ON THIS DETAIL IS FOR TYPICAL CONDITIONS AND ARE SUBJECT TO CHANGE BY THE GEOTECHNICAL CONSULTANT.

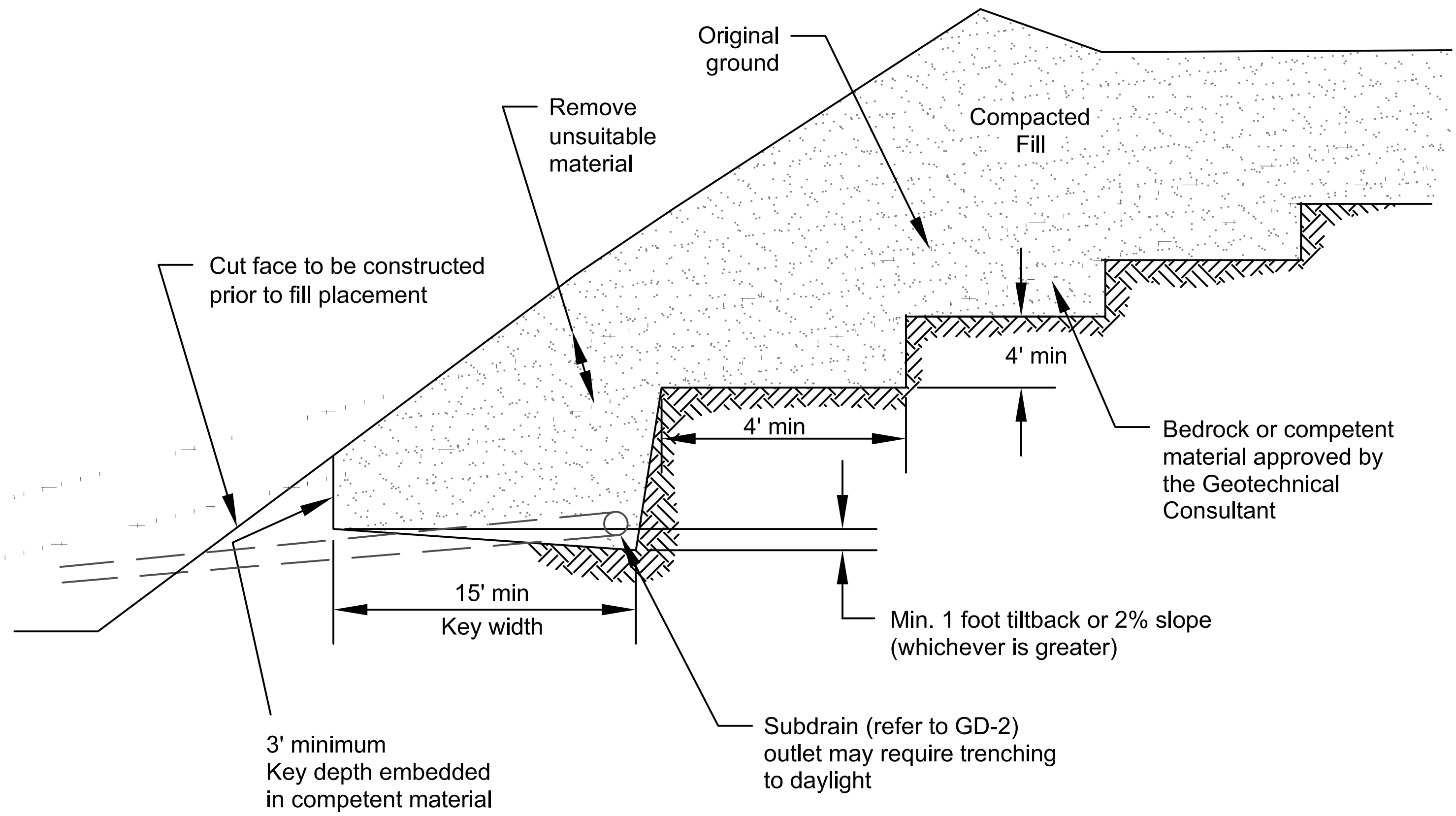
KCG KLING Consultanting Group, Inc.

ROCK DISPOSAL DETAIL

GD-5

REVISION DATE: 10/01

STANDARD.I



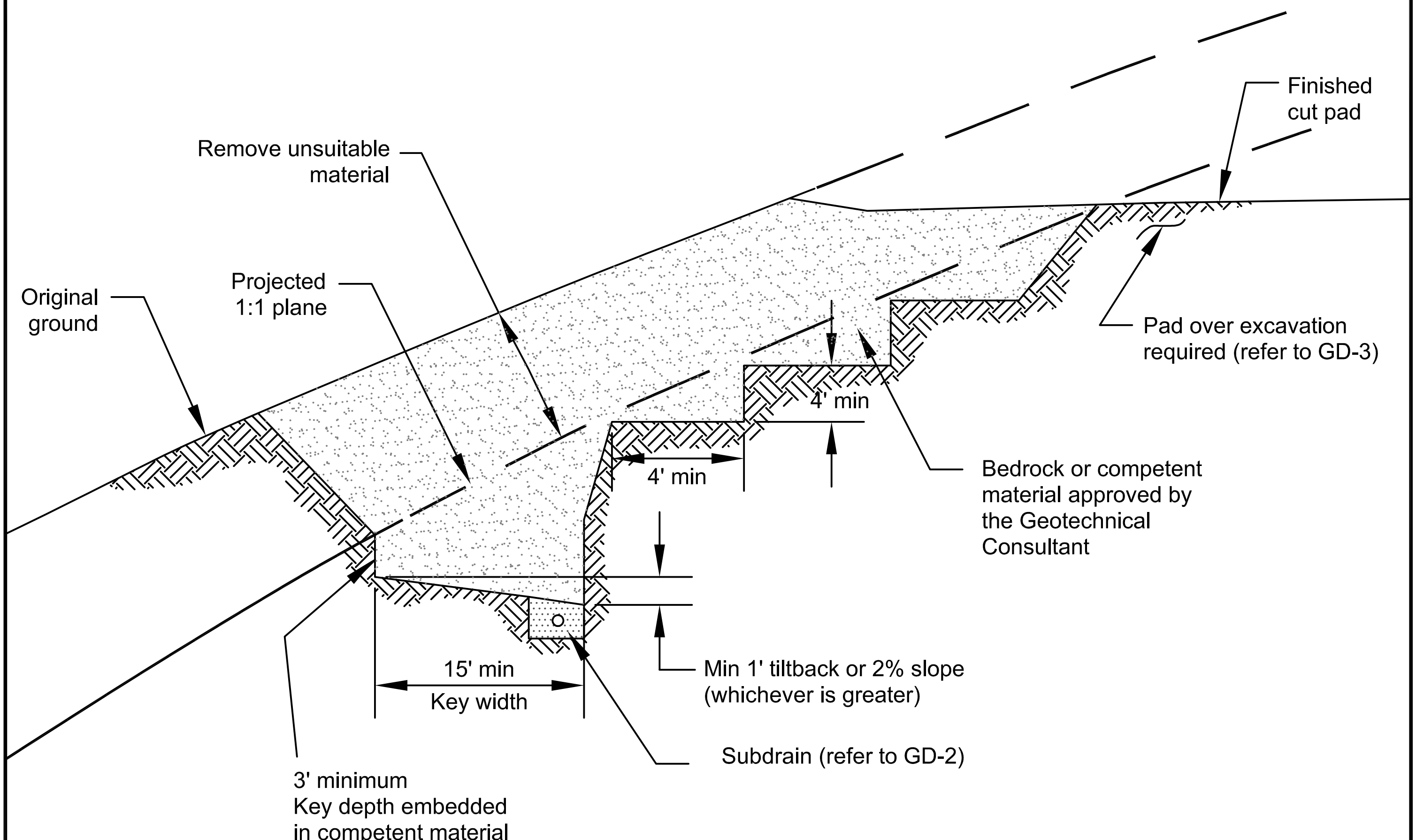
INFORMATION DEPICTED ON THIS DETAIL IS FOR TYPICAL CONDITIONS AND ARE SUBJECT TO CHANGE BY THE GEOTECHNICAL CONSULTANT.

KCG KLING Consultanting Group, Inc.

FILL OVER CUT SLOPE DETAIL

GD-6

REVISION DATE: 10/01



INFORMATION DEPICTED ON THIS DETAIL IS FOR TYPICAL CONDITIONS AND ARE SUBJECT TO CHANGE BY THE GEOTECHNICAL CONSULTANT.

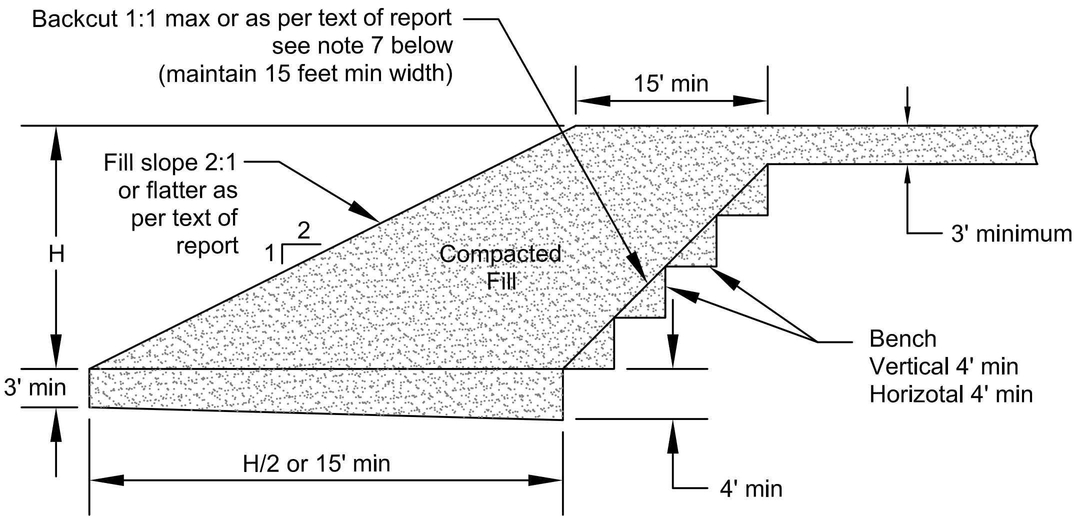
KCG KLING Consultanting Group, Inc.

DESIGN SIDE HILL SHEAR KEY DETAIL
GD-7

REVISION DATE: 10/01

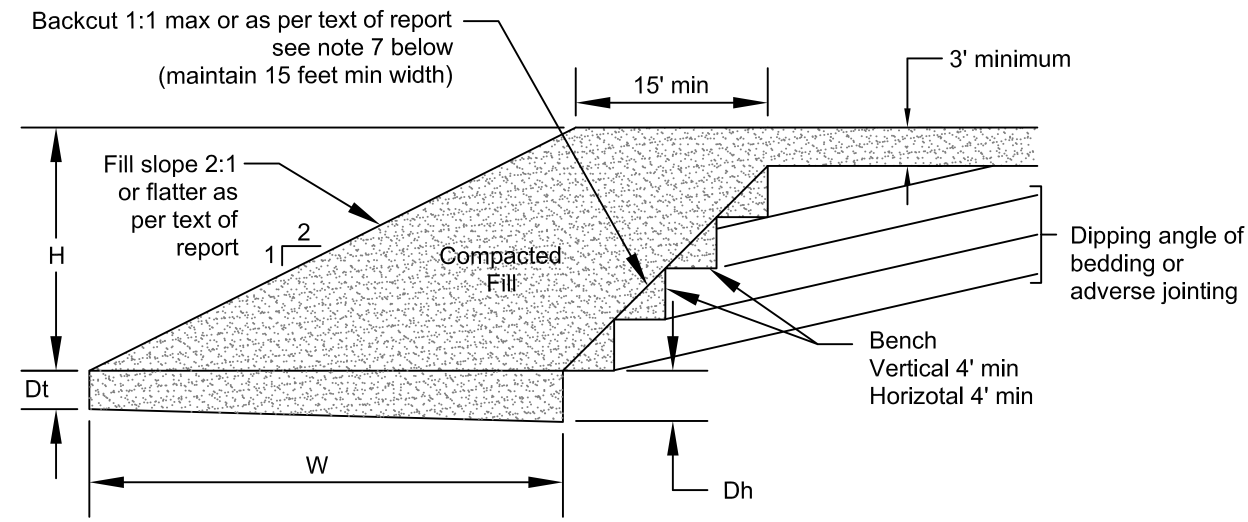
TYPICAL STABILIZATION FILL

Figure 1



TYPICAL BUTTRESS FILL

Figure 2



NOTES

1. A 3 foot blanket fill shall be provided above and adjacent to stabilization fills and/or buttress fills.
2. W= width of key as specified in Geotachnical report (no less than H/2 or 15 feet, whichever is greater).
3. Dt = Depth of key at toe.
4. Dh = Depth of key at heel.
5. With and depth of buttress key as specified in Geotechnical report.
6. For subdrain detail, see Plate GD-2.
7. Contractor is responsible for safety. Standard backcut recommedations herin may be superceded by the Geotechnical Consultant during grading.

INFORMATION DEPICTED ON THIS DETAIL IS FOR TYPICAL CONDITIONS AND ARE SUBJECT TO CHANGE BY THE GEOTECHNICAL CONSULTANT.

KCG KLING Consultanting Group, Inc.

STABILIZATION & BUTTRESS FILL DETAIL

GD-8

REVISION DATE: 10/01

APPENDIX F

HARDSCAPE RECOMMENDATIONS

KCG KLING Consulting Group, Inc.

HARDSCAPE RECOMMENDATIONS FOR EXPANSIVE SOILS (COMMERCIAL/INDUSTRIAL BUILDING)[4]

Description	Minimum Concrete Thickness (Inches)	Subgrade Pre-Soaking Depth	Reinforcement [1]	Cutoff Barrier or Edge Thickness	Joint [2] Spacing (Max)	Base
Common Sidewalks - Isolated EI<21 EI 21-50 EI 51-90 EI 91-130 EI>130	 4 4 4 5 5	 Optimum to 12" 120% of/or 5% over optimum (whichever is greater) to 12” 120% of/or 5% over optimum (whichever is greater) to 18” 120% of/or 5% over optimum (whichever is greater) to 24” 130% of/or 5% over optimum (whichever is greater) to 24”	N.R.	N.R.	5-10 Feet 5-10 Feet 5-10 Feet 6 feet 6 feet	N.R.
Common Sidewalks - Not Isolated (adjacent to curbs or structures) EI<21 EI 21-50 EI 51-90 EI 91-130 EI>130	 4 4 4 5 5	 Optimum to 12" 120% of/or 5% over optimum (whichever is greater) to 12” 120% of/or 5% over optimum (whichever is greater) to 18” 120% of/or 5% over optimum (whichever is greater) to 24” 120% of/or 5% over optimum (whichever is greater) to 24”	Dowel into curbs and entries with #4 Re-bar at 24” O.C.	N.R.	5-10 Feet 5-10 Feet 5-10 Feet 6 feet 6 feet	N.R.
Enhanced or Decorative Concrete (where higher degree of crack control is desired) E<21 EI 21-50 EI 51-90 EI 91-130 EI>130	 5 5 5 6 6	 Optimum to 12" 120% of/or 5% over optimum (whichever is greater) to 12” 120% of/or 5% over optimum (whichever is greater) to 18” 120% of/or 5% over optimum (whichever is greater) to 24” 120% of/or 5% over optimum (whichever is greater) to 24”	 6x6 – W1.4xW1.4 Mesh 6x6 – W2.9xW2.9 Mesh #3 re-bar @ 18” O.C., E.W. #3 re-bar @ 12” O.C., E.W. #4 re-bar @ 12” O.C., E.W.	 12” thick x 12” wide 12” thick x 12” wide 12” thick x 12” wide 12” thick x 12” wide 12” thick x 12” wide	 5-10 Feet 5-10 Feet 5-10 Feet 6 feet 6 feet	 N.R.
Curb and Gutter	C.S.	Scarify 6”/Pre-Moisten	N.R.	N.R.	10 Feet	N.R.
General Concrete Paving [3]	7	N.R.	N.R.	12”x12” where adjacent to landscape	10 Feet	6”
Trash Enclosure/Loading Bay [3]	8	N.R.	N.R.	12”x12” where adjacent to landscape	10 Feet	6"

N.R. = Not Recommended
C.S. = City/County Standard
O.C. = On Center
E.W. = Each Way

General Notes:

(A) All concrete thickness should be “full”
(B) Square concrete panels when possible
(C) Maintain positive drainage from concrete flatwork
(D) All slab reinforcement should be placed at mid-height of slab
(E) The above recommendations are intended to mitigate expansive soils independent of other design considerations. The recommendations of the structural engineer and/or architect should also be incorporated into the final design.

Footnotes:

(1) Reinforcement to extend into cutoff barrier in thickened edge.
(2) Joint at curves or angle points.
(3) The above concrete paving recommendations are for planning purposes only.
An actual pavement design should be generated based on concrete strength, and frequency and magnitude of anticipated axle loads.
(4) The above recommendations are intended to mitigate expansive soils independent of other design considerations.
The recommendations of the structural engineer and/or architect should also be incorporated into the final design.

APPENDIX G

ASFE INSERT

Important Information About Your

Geotechnical Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes

The following information is provided to help you manage your risks.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one - not even you* - should apply the report for any purpose or project except the one originally contemplated.

Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from alight industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes - even minor ones - and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ-sometimes significantly from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final*, because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual subsurface conditions revealed during construction. The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.

A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time* to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the express purpose of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in-this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

Rely on Your ASFE-Member Geotechnical Engineer For Additional Assistance

Membership in ASFE/The Best People on Earth exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your ASFE-member geotechnical engineer for more information.

ASFE
The Best People on Earth

8811 Colesville Road/Suite G106, Silver Spring, MD 20910
Telephone:' 301/565-2733 Facsimile: 301/589-2017
e-mail: info@asfe.org www.asfe.org

IIGER06045.0M

Appendix G

Noise and Vibration Analysis

Angelus Block

Rialto, CA

Noise Impact Analysis

7-17-2020

TABLE OF CONTENTS

TABLES

EXHIBITS

FIGURES

APPENDICES

1. Introduction

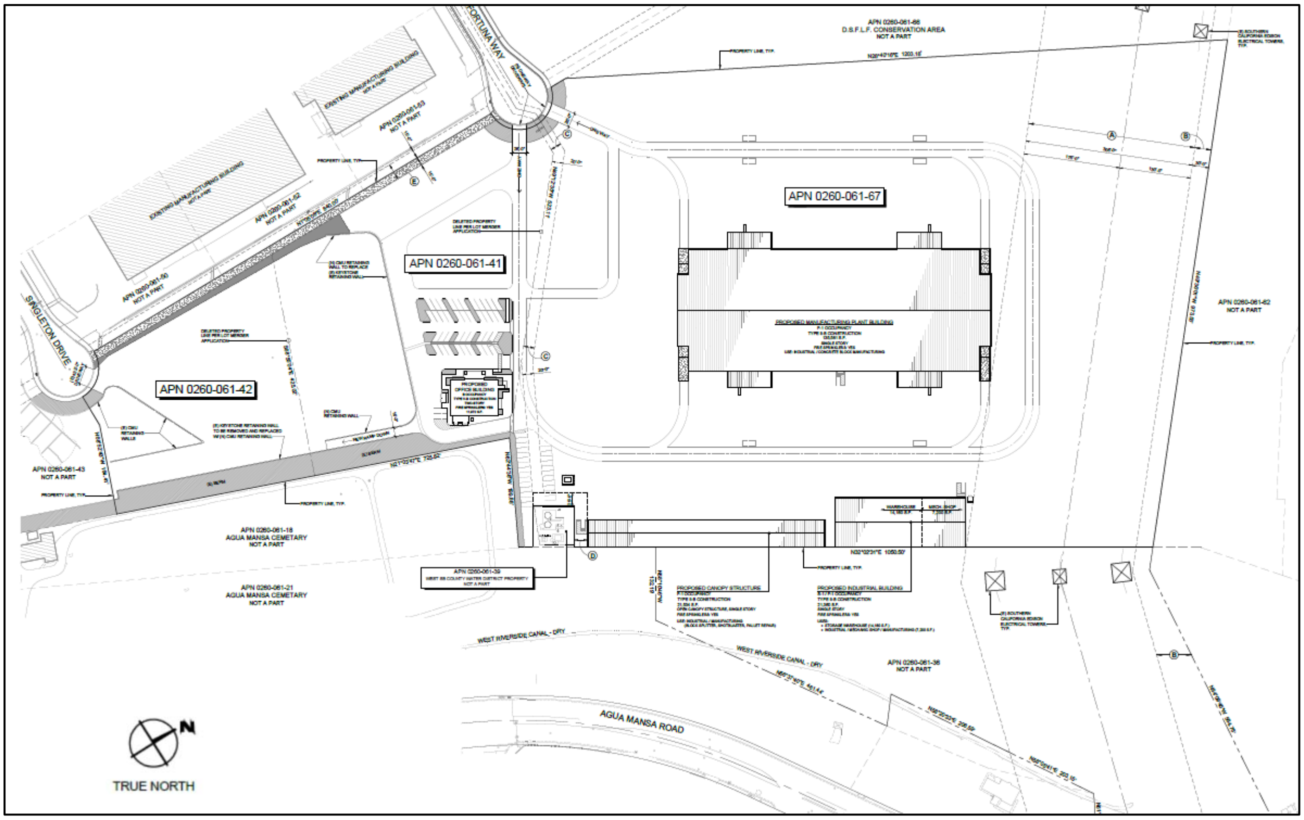
This section analyses the potential noise and vibration impacts associated with the proposed project. This study evaluates the impact of the construction and the long-term operation of the project on the surrounding areas by comparing the existing noise environment with the projected noise levels from the project. This study will identify any significant impact and propose mitigation measures for each identified significant impact.

2. Project Description

The proposed project is the construction and operation of an industrial site which include a manufacturing plant building, an industrial building, a storage warehouse and an office building. The project is located in the city of Rialto on Fortuna Way. It is south of the Highway 10 and east of the 215 Highway. Figure 1 shows the proposed project site location and Figure 2 shows the project plan of the industrial site.

Figure 1: Site Location

Figure 2: Project Plan



3. Noise and Vibration Fundamentals

Sound, Noise and Acoustics

Sound is a mechanical radiant energy that is transmitted by longitudinal pressure waves in a material medium, such as air in the case of traffic and stationary noise, and is the objective cause for human hearing. Sound is technically described in terms of the loudness (amplitude) and frequency (pitch) of the sound. Noise is defined as an unwanted sound.

Frequency

When sound travels through air, the atmospheric pressure varies periodically. The number of pressure variations per second is called the frequency of sound and is measured in Hertz (Hz) which is defined as cycles per second. Our hearing systems are not equally sensitive to all sound frequencies. Thus, not all frequencies are perceived as being equally loud at the same sound pressure level, and when calculating overall environmental noise ratings it is necessary to consider sounds at some frequencies as more impactful than those at other frequencies. Low-

(squeak). The human ear can hear from a bass pitch starting at 20 Hz all the way to the high pitch of 20,000 Hz.

Sound Pressure Levels and Decibels

Sound pressure level (SPL or Lp) is a logarithmic measure of the effective pressure of a sound relative to a reference value. The sound pressure levels are measured in decibels abbreviated dB. The human ear is not equally sensitive to sound at all frequencies. The "A-weighted scale," abbreviated dBA, reflects the normal hearing sensitivity range of the human ear. On this scale, the range of human hearing extends from approximately 3 to 140 dBA. Exhibit C provides examples of A-weighted noise levels from common sounds.

Exhibit 1 – A-weighted common noise level scale

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	— 110 —	Rock band
Jet fly-over at 1000 feet		
	— 100 —	
Gas lawn mower at 3 feet		
	— 90 —	
Diesel truck at 50 feet at 50 mph		Food blender at 3 feet
	— 80 —	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawn mower, 100 feet	— 70 —	Vacuum cleaner at 10 feet
Commercial area		Normal speech at 3 feet
Heavy traffic at 300 feet	— 60 —	
		Large business office
Quiet urban daytime	— 50 —	Dishwasher next room
Quiet urban nighttime	— 40 —	Theater, large conference room (background)
Quiet suburban nighttime		
	— 30 —	Library
Quiet rural nighttime		Bedroom at night, concert
	— 20 —	
		Broadcast/recording studio
	— 10 —	
Lowest threshold of human hearing	— 0 —	Lowest threshold of human hearing

dBA = A-weighted decibels; mph = miles per hour

Source: California Department of Transportation, *Technical Noise Supplement*, September 2013.

Addition of Decibels

Because decibels are on a logarithmic scale, sound pressure levels cannot be added or subtracted by simple plus or minus addition. To add two or more noise levels, if the difference between the highest and next highest noise level is: 0–1 dB then add 3 dB to the higher level to give the total noise level, 2–3 dB then add 2 dB to the higher level to give the total noise level, 4–9 dB then add 1 dB to the higher level to give the total noise level, 10 dB and over, then the noise level is unchanged (i.e. the higher level is the total level)

Human Response to Changes in Noise Levels

In general, the healthy human ear is most sensitive to sounds between 1,000 Hz and 5,000 Hz, and it perceives a sound within that range as being more intense than a sound with a higher or lower frequency with the same magnitude. For purposes of this report as well as with most environmental documents, overall sound levels are determined by applying frequency weighted adjustments to spectral sound levels. The A-scale weighting scale is used to mimic human hearing response, so sound is reported in terms of A-weighted decibels (dBA). Typically, the human ear can barely perceive a change in noise level of 3 dBA. A change in 5 dBA is readily perceptible, and a change in 10 dBA is perceived as being twice or half as loud.

Sound Propagation

Sound is transmitted in air by pressure variations from its source to the surroundings. Sound levels will decrease as the distance between the source and the receiver increases. While absorption by air is one of the factors attributing to the weakening of a sound during transmission, distance plays a more important role in noise reduction during transmission. Depending on the source of the sound for every doubling of distance the level will be reduced between 3 and 6 dB. The reduction of a sound is called attenuation.

Other factors for noise attenuation are ground absorption and shielding. Noise models use hard site (reflective surfaces) and soft site (absorptive surfaces) to help calculate predicted noise levels. Hard site conditions assume no excessive ground absorption between the noise source and the receiver. Soft site conditions such as grass, soft dirt or landscaping attenuate noise at a rate of an additional 1.5 dB per doubling of distance.

In order to break the line of sight, walls between a noise source and a receiver are often used for noise attenuation to reduce the noise levels at the receiver. Additional barriers such as buildings, hills and heavy vegetations can also reduce the noise levels. Typically, walls will reduce noise levels by 5-10dB. The higher the wall is, the higher the noise reduction will be.

Measurement of Sound

There are many ways to evaluate noise measured over periods of time. Equivalent continuous sound level (Leq) is the total sound energy measured over a stated period of time. LAs(Max) is the maximum level with A-weighted frequency response and slow time constant. The Community Noise Equivalent Level (CNEL) is the LAeq (equivalent noise level) over a 24-hour period with a penalty of 5dB(A) for noises occurring from 7:00pm to 10:00pm and a penalty of 10dB(A) for noises occurring from 10:00 p.m. to 7:00 a.m. The noise penalty is added to the noise events during the evening and nighttime hours when individuals are more sensitive to noise.

Ground-Borne Vibration

Vibration is periodic motion of a solid medium in alternately opposite directions from the position of equilibrium in which the motion’s amplitude can be described in terms of displacement, velocity, or acceleration. The peak particle velocity (PPV) or the root mean square (RMS) velocity is usually used to describe vibration amplitudes. The PPV is defined as the maximum instantaneous peak or negative peak of the vibration wave. The RMS is defined as the square root of the average of the squared amplitude of the signal. PPV is the most commonly used descriptor for evaluating potential building damage, whereas RMS is generally used to assess human response. Typically, ground-borne vibration, generated by man-made activities, attenuates rapidly with distance from the source of vibration. Man-made vibration issues are therefore usually confined to short distances (i.e., 500 feet or less) from the source.

Operation of construction equipment, maintenance operations and traffic traveling on roadways can generate ground-borne vibration. In order to assess the human response in relation to gound vibrations, Caltrans developed criteria shown in *Table 1: Guideline Vibration Annoyance Potential Threshold Criteria*.

Table 1: Guideline Vibration Annoyance Potential Threshold Criteria

Human Response	Maximum PPV (in/sec)	
	Transient Sources	**Continuous/Frequent Intermittent Sources**
Barely perceptible	0.04	0.01
Distinctly perceptible	0.25	0.04
Strongly perceptible	0.9	0.10
Severe	2.0	0.4

Note: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

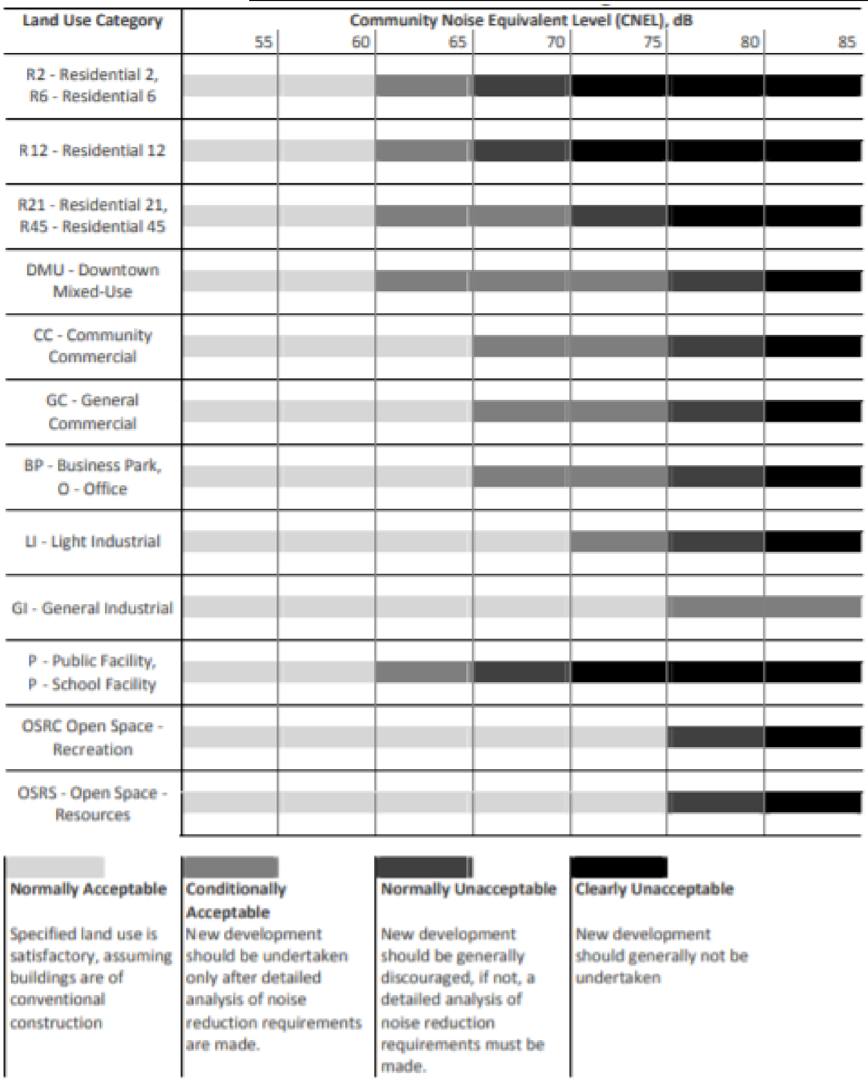
Source: Caltrans, Transportation- and Construction-Induced Vibration Guidance Manual, Table 20, 2020

4. Regulatory Framework

City of Rialto General Plan

In the City of Rialto's Noise Element of the General Plan, the city of Rialto established noise/land use compatibility guidelines in accordance with the California standard. The City of Rialto Noise Guidelines for Land Use Planning is presented in Exhibit 2.

Exhibit 2: Rialto Noise Guidelines for Land Use Planning



Source: Noise Element of the General Plan for the city of Rialto, December 2010

City of Rialto Municipal Codes

The city of Rialto's noise ordinance is Chapter 9.50 of the municipal codes. The noise ordinance doesn't provide numeric maximum noise levels but prohibits, section 9.50.030 making or knowingly and unreasonably permitting to be made any unreasonably loud, unnecessary or unusual noise that disturbs the comfort, repose, health, peace, and quiet or which causes discomfort or annoyance to any unreasonable person of normal sensitivity. Characteristics and conditions that may be considered in determining whether this has been violated, include:

a) The level of noise
b) Whether the nature of the noise is usual or unusual

c) Whether the origin of the noise is natural or unnatural
d) The level of the background noise
e) The proximity of the noise to sleeping facilities
f) The nature and zoning of the areas within which the noise emanates
g) The density of the inhabitation of the area within which the noise emanates
h) The time of day or night the noise occurs
i) The duration of the noise
j) Whether the noise is recurrent, intermittent or constant
k) Whether the noise is produced by a commercial or noncommercial activity

The city noise ordinance also prohibits, section 9.50.050, loading or unloading any vehicle, or operate or permit the use of dollies, carts, forklifts, or other wheeled equipment that causes any impulsive sound, raucous, or unnecessary noise within a thousand feet of a residence.

Disturbances from construction activities are detailed in section 9.50.070 as such:

A. No person shall engaged or employees, or cause any other person to be engaged or employed, in any work of construction, erection, alteration, repair, addition, movement, demolition, or improvement to any building or structure except within the hours provided for by subsection B of this section.
B. Permitted hours for construction work:
   1. October 1st through April 30th
      - Monday – Friday 7 AM to 5:30 PM
      - Saturday 8 AM to 5 PM
      - Sunday – No permissible hours
      - State holidays – No permissible hours
   2. May 1st through September 30th
      - Monday – Friday 6 AM to 7 PM
      - Saturday 8 AM to 5 PM
      - Sunday – No permissible hours
      - State holidays – No permissible hours

Ground-Borne Vibration Guidelines

The city of Rialto does not have any standards relative to ground-borne vibration. Caltrans has a guidance manual ("Transportation- and Construction-Induced Vibration Guidance Manual" dated June 2004) that provides thresholds for potential impacts on human comfort and damage to buildings that will be used to assess impacts due to ground-borne vibration. In most circumstances, common ground-borne vibrations related to roadway traffic and construction activities pose no threat to buildings or structures.

5. Environmental Settings

Noise Sensitive Receptors Locations

The project site is in the Sub-Area 8 of the Agua Mansa Specific Plan. The site is surrounded by industrial areas and one single family home (R1) located along Agua Mansa Road about 450 feet east of the northeast portion of the site which is the only sensitive receptor near the project site. There are no other residential properties or sensitive receptors within a half mile radius of the site.

Ambient Noise Levels

Ambient Noise or background levels are the all-encompassing noises associated with a given environment at a specific time, usually a composite of sound from many sources from many directions, near and far without any particular dominant sound. The primary existing noise sources surrounding the project site are traffic noises from S Riverside Avenue, Agua Mansa Road and Interstate 10.

Ambient noise measurements were conducted at three locations in the vicinity of the project site. Figure 1, Ambient Noise Measurement Locations, shows one long-term (24-hour) measurement was conducted at location LT1 and two short-term (30-minute) measurements were conducted at locations ST1 and ST2.

The ambient noise measurements were conducted on June 17th, 2020 and June 18th, 2020 using a Larson Davis 831c – Type 1 Sound Level Meter (SLM). The SLM was calibrated before and after each noise measurement according to the manufacturer specification; the SLM microphone was placed at a height of 5 feet off the local grade.

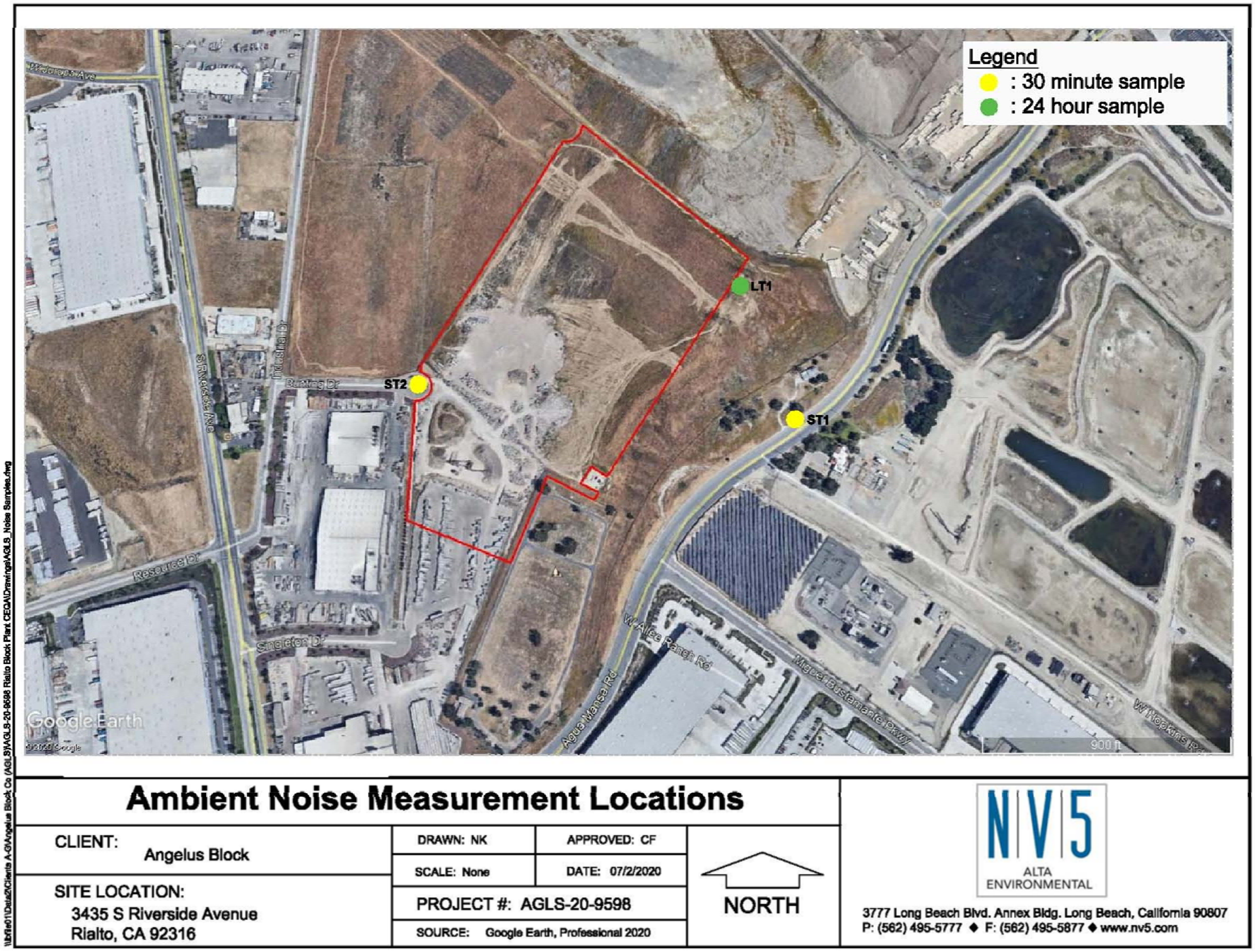
Table 2 summarizes the results of the long-term and short-term measurements:

Table 2: Ambient Noise Measurements (dBA)

ID	Sample Location	Sample Time	Major Noise Sources	Leq (dBA)	Lsmax (dBA)	LsMin (dBA)	Comments
LT1	Northeast Corner of the project site (3435 S Riverside Avenue, Rialto, CA)	7:33AM on June 17th, 2020 - 7:33AM on June 18th, 2020	Vehicles, Animal noise, Several airplanes pass overhead, buzzing from nearby electric towers.		75.4	43.1	CNEL is 57.1dBA
ST1	**(R1)** 795 Agua Mansa Road: 12'3" N of Driveway, 3'3" from the curb	04:24 AM – 04:54 AM on June 17th, 2020	Moderate traffic on Agua Mansa including semi-trucks and motorcycles.	68.4	85.7	51.3	Semi-trucks were parked idling on side of Agua Mansa Road. Trucks turned off their engine at 4:27Am
ST2	Site Entrance on Fortuna Way: 71" south from the driveway and 36"east from the curb	05:13AM – 0546 AM on June 17th, 2020	No traffic in cul-de-sac, distant vehicle noise, distant alarms, noise from surrounding businesses	58.4	68.2	54.5	A loud unidentified humming sound started at 5:44AM

dBA: A-weighted decibels;
Leq: Average noise level;
Lsmax: Maximum noise level (slow response);
Lsmin: Minimum noise level (slow response);
CNEL: Community Noise Equivalent Noise Level

Figure 3: Ambient Noise Measurement Locations



6. Environmental Impacts

Thresholds of Significance

According to the current CEQA Appendix G guidelines, noise impacts are considered potentially significant if they cause:

A. Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies. Noise levels exceeding the City of Rialto Noise Standards would be considered significant.
B. Exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels.
C. A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.
D. A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

Impact Analysis

A. *Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.*

Project Construction Noise

The city of Rialto doesn't have established maximum allowable noise levels but the city's municipal code defines the following hours during which construction activities are permitted: from October 1st through April 30th: Monday – Friday 7 AM to 5:30 PM and Saturday 8 AM to 5 PM and form May 1st through September 30th: Monday – Friday 6 AM to 7 PM and Saturday 8 AM to 5 PM.

Construction activities would result in a significant impact if they were to occur outside of the hours defined above and on Sundays and on State holidays.

This project's construction is scheduled to take place during the permitted hours in the city of Rialto municipal plan.

Construction of the proposed project would involve the following phases: site preparation, grading, building construction and paving. The phases of construction and duration for each phase are described in Table 4 – Predicted Construction Noise Levels at Nearest Sensitive Receptor (R1).

Noise impacts form the construction activities were evaluated by estimating the typical noise levels for each type of construction equipment using the Federal Highway Administration

(FHWA) roadway construction model (RCNM) and comparing the Leq at the nearest sensitive receptor (R1) with the ambient noise levels from the field measurement (see Table 2)

Estimated usage was estimated for each expected equipment from the construction activities as shown in Table 3 - Maximum noise levels and estimated usage of typical construction equipment. Each type of construction equipment produces a maximum noise levels (Lmax) at a reference distance of 50 feet from the noise source.

Table 3: Maximum noise levels and estimated usage of typical construction equipment

Type of Equipment	Estimated Usage (%)	L_{max} at 50 feet (dBA)
Tractor	40	84
Backhoe	40	77.6
Crane	16	80.6
Dozer	40	81.7
Grader	40	85
Excavator	40	80.7
Man Lift	20	74.7
Welder / Torch	40	74
Generator	50	80.6
Paver	50	77.2
Roller	20	80
All Other Equipment > 5 HP	50	85

Noise levels generated by construction equipment (or by any point source) decrease at a rate of approximately 6 dBA per doubling of distance from the source. The only residence in the vicinity of the site (R1) is located approximately 650 feet from the location where the construction activities would take place. Using the RCNM, the noise levels were calculated for R1 at 650 feet from the construction equipment, as presented in *Table 4, Predicted Construction Noise Levels at Nearest Sensitive Receptor (R1).*

Table 4: Predicted Construction Noise Levels at Nearest Sensitive Receptor (R1)

Phase	Duration	Expected Equipment	Leq at R1 (650 feet) (dBA)	Ambient Noise Level at R1	Significant Impact
Site Preparation	1 Month	Tractors/Loaders/backhoes, dozers	60.3	68.4	No
Grading	2 Month	Graders, dozers, tractors/loaders/ backhoes, excavators	63.2	68.4	No
Building Construction	12 Months	Cranes, lifts, tractors/loaders/backhoes, welders, generator sets	61	68.4	No
Paving	2 Months	Pavers, rollers, tractors/loaders/backhoes, cement mixers, and other paving equipment	62.9	68.4	No

As shown in Table 4, the highest noise levels at R1 will during the grading activities when noise levels from construction activities would be as high as 63.2dBA. The ambient noise levels at the residence was measured at 68.4dBA which is higher than the highest expected noise from construction activities. Construction activities would be required to comply with the City's allowable construction hours as described above and would be temporary in nature. Therefore, noise impacts from construction are considered **less than significant**.

Project Operational Noise

The potential for a substantial permanent increase in noise levels was assessed for mobile sources stationary and sources. The City of Rialto does not have numeric maximum noise levels not to exceed but prohibits unreasonable noise. A significant impact related to operational noise would result if:

The Project would cause ambient noise levels to increase by 5 dBA, CNEL or more and the resulting noise falls on a noise-sensitive land use within an area categorized "normally acceptable" (see Exhibit 2 for description of these categories); or cause ambient noise levels to increase by 3 dBA, CNEL or more and the resulting noise falls on a noise sensitive land use within an area categorized "conditionally acceptable", "normally unacceptable" or "clearly unacceptable".

Operational Traffic Noise

The Project would generate traffic along adjacent roads including Fortuna Way, Industrial Drive, S Riverside Avenue and Agua Mansa Road.

Operational mobile noise was assessed using the FHWA Traffic Noise Model Version 2.5 (TNM 2.5). TNM 2.5 is a computer model based on two FHWA reports: FHWA-PD-96-009 and FHWA-PD-96-010 (FHWA 1998a, 1998b). Key inputs to the traffic noise model were roadway widths, traffic mix, and speed. Noise levels were modeled the project site for Existing (2020) conditions Plus Growth (for opening year 2022) and; Existing Plus Growth Plus Project Conditions. This would be the most conservative noise condition as this alternative would generate the highest number of trucks during the peak hour.

The predicted CNELs were calculated as peak hour Leq and converted into CNEL using the California Department of Transportation Technical Supplement (September 2013). The conversion involved making a correction for peak hour traffic volumes as a percentage of average daily traffic and a nighttime penalty correction. The peak hour traffic was assumed to be ten percent of the average daily traffic. Traffic data was obtained from the Traffic Impact Analysis prepared by NV5.

Operational traffic noise levels for the Project site analysis are summarized in Table 5.

Table 5: Project-Related Traffic Noise

Modeled Receptor	Key Roadway Segment	Existing + Growth Noise Level (dBA CNEL)	Existing + Growth + Project Noise Level (dBA CNEL)	Noise Level Increase (dB)
R1- Residence on Agua Mansa Road (east of project)	Agua Mansa Road – S Rancho Avenue to S Riverside Avenue.	64.9	64.9	0

The roadway noise increase attributed to the proposed project would be less than 3 dBA on the local roadway that the project trips would result in a perceptible change in sound level for a person with normal hearing sensitivity. Therefore, the proposed project would result in a **less than significant** impact related to operational traffic noise.

Operational On-site Stationary Noise

On-site stationary noise sources including forklifts, front loader, truck loading and parking were assessed using SoundPlan Essential 5.0 acoustical modeling software. The model incorporated a three-dimensional geometric model of the project site developed from digital terrain information, available Geographic Information Systems (GIS) information, aerial photography, and the site plan. The reference noise levels listed in Table 6 were used for the forklift, front loader, and truck noise sources. The parking reference noise levels presented in Table 7 are typical parking noise levels included in SoundPlan Essential 5.0.

Table 6. Source Sound Power Levels in Octave Band Format (dB, re 10-12W)

Equipment / Source [1]	Level (dBA)	Octave Band Centre Frequency (Hz), Sound Power Levels (dBA)							
		63	125	250	500	1,000	2,000	4,000	8,000
Front Loader	112.9	84.8	100.9	111.4	104.7	99	98.2	93	84.9
Forklift	100	81.6	85.6	89.6	92.6	95.6	93.6	88.6	83.6
Trucks - Entrance Path	77	58.5	62.5	66.5	69.5	72.5	70.5	65.5	60.5
Trucks - Exit Path	77	58.5	62.5	66.5	69.5	72.5	70.5	65.5	60.5
[1] Noise levels for each source were from SoundPlan Essential noise reference library.									

Table 7. Source Sound Power Levels – Parking Lots

Name	Size		Movements per hour			Road surface	Lw,ref (dBA)
			Day	Evening	Night		
Employee and customer parking	40	Parking bays	1	0	1	Asphaltic driving lanes	82.7

Based on this noise analysis of the operational on-site stationary noise, the noise level at the residence would be 59.9 dBA L_{eq} during the daytime and 58.7dBA L_{eq} during the nighttime as the activities on site are supposed to operate from 4am to 10pm. The measured ambient noise level at the residence was 68.4dBA L_{eq}, therefore the noise from the on-site activities are not expected to be a disturbance for the residence as required by the city of Rialto municipal code. The acoustical impact of the stationary noise for the proposed project would be **less than significant**.

B. Exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels.

Ground-borne Vibration

Ground-borne Vibration During Construction

Because construction activity is short-term and equipment moves around a project site, the primary concern regarding construction vibration relates to building damage. Activities that can result in damage include demolition and site preparation in close proximity to sensitive structures. This project site is not expected to do any demolition. The stie preparation activities will take place all over the project site which is located at least 100 feet from the closest structure.
Caltrans, Transportation- and Construction-Induced Vibration Guidance Manual (2020), has developed damage potential threshold criteria for typical building structure and condition. For older residences, the maximum PPV (in/sec) is 0.3 and for commercial buildings the maximum PPV (in/sec) is 0.5. Vibration is a localized event and attenuates rapidly with distance and at this

distance vibration damage would not occur. Based on the guidance document published by the Federal Transit Administration, Transit Noise and Vibration Impact Assessment (September 2018), a large bulldozer would generate vibration levels of 0.089 in/sec at 25 feet. Construction equipment would not operate within 100 feet of an existing, off-site building. The maximum vibration level at 100 feet would be 0.011 inches per second. Therefore, the proposed project would result in a **less than significant** impact related to building damage from construction vibration.

Ground-borne Vibration During Operations

The project is not expected to be operating heavy-duty industrial equipment. Trucks and cars are not expected to generate any perceptible vibration levels outside of the right-of-way. There are no operational sources of vibration that would generate vibration levels that exceed 0.04 in/sec. Therefore, the proposed project would result in a **less than significant** impact related to operational vibration.

C. A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.

Permanent Noise Impact Analysis

Traffic Source Permanent Noise Impact

A project’s contribution to a traffic noise increase would be considered significant when the combined effect exceeds the perception level threshold of 3dB. The combined effect compares the “existing with project” condition to the “existing” conditions.

As discussed above in the operational traffic noise section, the project related traffic would not result in an increase of the noise in the vicinity of the project. As a result, noise impact from increased traffic would be **less than significant**.

Stationary Source Permanent Noise Impact

The project site is an industrial facility with truck access from Fortuna Way. Long-term operational noise from the project would consist of noise sources such as trucks, forklifts, vehicle on site traffic (cars) and one loader. As the worst-case scenario with all the sources operating at the same time, the noise levels from the project site are expected to be 59.9dBA at the closest residence. The ambient noise level at the residence was measured at 68.4dBA. Therefore, the combined noise levels are expected to be 69dBA, which is an increase of 0.6dB from the current noise levels. If the increase is less than 3dB, it is considered to be less than significant, therefore the noise level increase would be **less than significant** in the vicinity of the site.

D. ***A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.***

Temporary Noise Impact Analysis

Construction Temporary Noise Impact

The project proposes to construct a 135,581 sf main manufacturing plant building, a 6,000 sf industrial building, a 14,940 sf storage warehouse building and a 10,018 sf office building on the project site. Construction of the project would be done in 4 phases: site preparation, grading, building construction and paving. Typical construction equipment described above will be used for the project.

The construction hours will be temporary and limited during the construction hours listed in the city code, from October 1st through April 30th: Monday – Friday 7 AM to 5:30 PM and Saturday 8 AM to 5 PM and form May 1st through September 30th: Monday – Friday 6 AM to 7 PM and Saturday 8 AM to 5 PM.

During the paving phase, when the noise levels from the project are expected to be the loudest, the combined noise levels of the project noise with the existing noise levels will be 69.5dBA at the residence which is 1dB over the current ambient noise levels.

The temporary increase in ambient noise levels is less than 3dB, therefore the noise from temporary construction activities will be **less than significant**.

7. Mitigation Measure

No mitigation measures are required for this project.

8. References

- City of Rialto General Plan, *Noise Element,* December 2010
- City of Rialto Municipal Codes, *Chapter 9.50 (Noise Regulation)*
- Federal Highway Administration, *Roadway Noise Construction Model*, Software Version 1.1.
- Federal Highway Administration, *Traffic Noise Model TNM Software Version 3.0*.
- California Department of Transportation, Technical Noise Supplement, September 2013
- California Department of Transportation, *Transportation and Construction Vibration Guidance Manual*, April 2020
- Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, September 2018.
- Soundplan Essential 5.0, *Noise Sources: Forklift, Loader, Truck and Parking Noise*, 2017.

Noise Measurement Field Data			
Project:	Angelus Block – Rialto, CA Ambient Noise Measurements	Project Number:	AGLS-20-9598
Sample Name:	S1	Date:	6/17-6/18/20
Analyst:	Natalie Kvochak & Mabelle Wongsanguan	Time:	0733-0733
Location:	Eastern portion of proposed site		
Noise Sources:	Industrial activities from neighboring facilities, backup alarms, bird noises, airplanes		
Comments:			

Results (dBA):			
Leq:	Lmin:	Lmax:	Peak:
51.5	43.1	75.4	91.8

Equipment		Weather	
Sound Level Meter:	SoundAdvisor™ Model 831C	Temperature (˚F):	64˚F
Calibrator:	CAL200	Wind (MPH):	3 MPH
Response Time:	Slow	Sky:	Clear
Weighting:	A weighting	Barometric Pressure:	N/A
Microphone Height:	5' feet	Humidity:	76%

Photo:

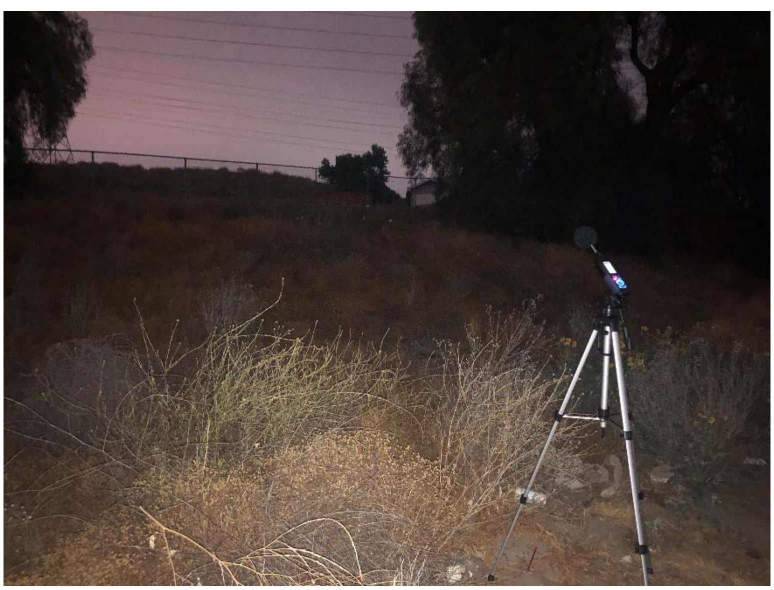
Noise Measurement Field Data

Project:	Angelus Block – Rialto, CA Ambient Noise Measurements	Project Number:	AGLS-20-9598
Sample Name:	S2	Date:	6/17/2020
Analyst:	Natalie Kvochak & Mabelle Wongsanguan	Time:	0424 - 0454
Location:	795 Aqua Mansa Road		
Noise Sources:	Automobiles, semitrucks, motorcycles, industrial activities from neighboring facilities, bird noises, airplanes		
Comments:	Moderate traffic. Motor of truck running at 0427.		

Results (dBA):			
Leq:	Lmin:	Lmax:	Peak:
68.4			105.2

Equipment		Weather	
Sound Level Meter:	SoundAdvisor™ Model 831C	Temperature (˚F):	63˚F
Calibrator:	CAL200	Wind (MPH):	2 MPH
Response Time:	Slow	Sky:	Clear
Weighting:	A weighting	Barometric Pressure:	N/A
Microphone Height:	5’ feet	Humidity:	77%

Photo:

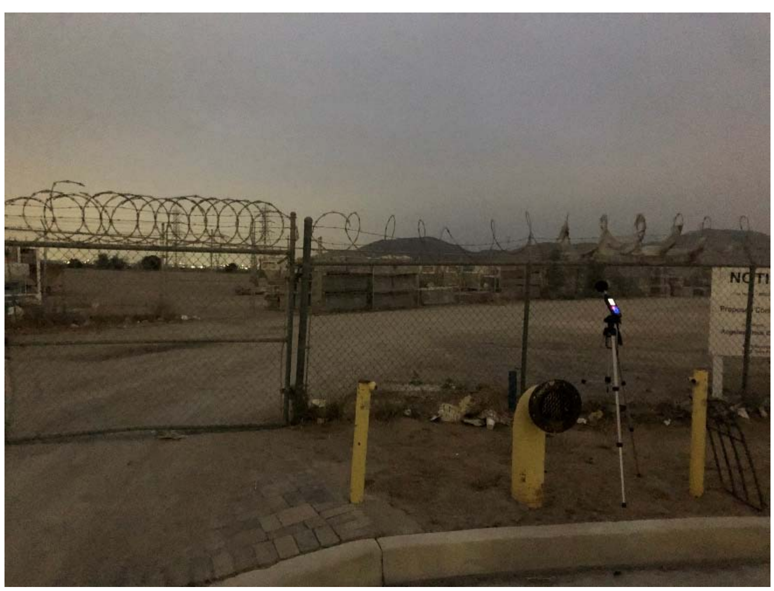


Noise Measurement Field Data			
Project:	Angelus Block – Rialto, CA Ambient Noise Measurements	Project Number:	AGLS-20-9598
Sample Name:	S3	Date:	6/17/2020
Analyst:	Natalie Kvochak & Mabelle Wongsanguan	Time:	0513 - 0546
Location:	Fortuna Way cul-de-sac		
Noise Sources:	Industrial activities from neighboring facilities, backup alarms, bird noises, airplanes		
Comments:	No traffic in cul-de-sac. Loud humming from EZ-mix at 0544.		

Results (dBA):			
Leq:	Lmin:	Lmax:	Peak:
58.4	54.5	68.2	79.3

Equipment		Weather	
Sound Level Meter:	SoundAdvisor™ Model 831C	Temperature (˚F):	63˚F
Calibrator:	CAL200	Wind (MPH):	3 MPH
Response Time:	Slow	Sky:	Clear
Weighting:	A weighting	Barometric Pressure:	N/A
Microphone Height:	5' feet	Humidity:	77%

Photo:



Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 7/10/2020
Case Description: Site Preparation

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
795 Agua Mansa	Residential	68.4	68.4	68.4

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Tractor	No	40	84		650	0
Backhoe	No	40		77.6	650	0
Dozer	No	40		81.7	650	0

Results

		Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
				Day		Evening		Night		Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Tractor		61.7	57.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe		55.3	51.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer		59.4	55.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	61.7	60.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 7/10/2020
Case Description: Grading

---- Receptor #1 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
795 Agua Mansa	Residential	68.4	68.4	68.4

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Tractor	No	40	84		650	0
Backhoe	No	40		77.6	650	0
Dozer	No	40		81.7	650	0
Grader	No	40	85		650	0
Excavator	No	40		80.7	650	0

Results

		Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
				Day		Evening		Night		Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Tractor		61.7	57.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe		55.3	51.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer		59.4	55.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Grader		62.7	58.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator		58.4	54.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	62.7	63.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 7/10/2020
Case Description: Paving

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
795 Agua Mansa	Residential	68.4	68.4	68.4

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Tractor	No	40	84		650	0
Backhoe	No	40		77.6	650	0
Paver	No	50		77.2	650	0
Roller	No	20		80	650	0
All Other Equipment > 5 HP	No	50	85		650	0

Results

		Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
				Day		Evening		Night		Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Tractor		61.7	57.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe		55.3	51.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver		54.9	51.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller		57.7	50.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP		62.7	59.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	62.7	62.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report dat 7/10/2020
Case Descr Building Construction

---- Receptor #1 ----

		Baselines (dBA)		
Descriptior	Land Use	Daytime	Evening	Night
795 Agua I	Residential	68.4	68.4	68.4

			Equipment			
			Spec	Actual	Receptor	Estimated
	Impact		Lmax	Lmax	Distance	Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Tractor	No	40	84		650	0
Backhoe	No	40		77.6	650	0
Crane	No	16		80.6	650	0
Man Lift	No	20		74.7	650	0
Welder / Torch	No	40		74	650	0
Generator	No	50		80.6	650	0

			Results												
	Calculated (dBA)			Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night		
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Tractor	61.7	57.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	55.3	51.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Crane	58.3	50.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Man Lift	52.4	45.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch	51.7	47.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Generator	58.4	55.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	61.7	61	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

REPORT: **INPUT TRAFFIC FOR TNM VEHICLES (LAeq)**

TNM VERSION: 3.0.7.60002 — REPORT DATE: 14 July 2020

CALCULATED WITH: 3.0.7.60002 — CALCULATION DATE: 7/14/2020 4:07:53 PM

CASE: Angelus Block (Existing + Growth) — ORGANIZATION: NV5

PATH: — ANALYSIS BY: cecile.felsher

CALCULATION SEQUENCE NUMBER: — TNM SERIAL NUMBER:

PROJECT/CONTRACT:

Roadway Name	Road Segment			Auto		Medium Truck		Heavy Truck		Bus		Motorcycle	
	Start Point		Total Volume	Percent	Speed	Percent	Speed	Percent	Speed	Percent	Speed	Percent	Speed
	Name	No.											
			[Veh/hr]	[%]	[mph]	[%]	[mph]	[%]	[mph]	[%]	[mph]	[%]	[mph]
Eastbound Agua Mansa Rd	Point-1	0	189	91.2	40	4.5	35	4.3	35	0.0	0	0.0	0
	Point-3	1	189	91.2	40	4.5	35	4.3	35	0.0	0	0.0	0
	Point-5	2	189	91.2	40	4.5	35	4.3	35	0.0	0	0.0	0
	Point-7	3	189	91.2	40	4.5	35	4.3	35	0.0	0	0.0	0
	Point-9	4	189	91.2	40	4.5	35	4.3	35	0.0	0	0.0	0
	Point-11	5	189	91.2	40	4.5	35	4.3	35	0.0	0	0.0	0
	Point-13	6	189	91.2	40	4.5	35	4.3	35	0.0	0	0.0	0
	Point-61	7	189	91.2	40	4.5	35	4.3	35	0.0	0	0.0	0
	Point-63	8	189	91.2	40	4.5	35	4.3	35	0.0	0	0.0	0
	Point-65	9	189	91.2	40	4.5	35	4.3	35	0.0	0	0.0	0
	Point-67	10	189	91.2	40	4.5	35	4.3	35	0.0	0	0.0	0
	Point-69	11	189	91.2	40	4.5	35	4.3	35	0.0	0	0.0	0
Southbound Riverside Avenue	Point-36	0	1257	86.4	40	3.6	35	10.0	35	0.0	0	0.0	0
	Point-37	1	1157	86.4	40	3.6	35	10.0	35	0.0	0	0.0	0
	Point-41	3	1157	86.4	40	3.6	35	10.0	35	0.0	0	0.0	0
	Point-45	5	1157	86.4	40	3.6	35	10.0	35	0.0	0	0.0	0
Westbound Agua Mansa Rd	Point-70	0	473	84.8	40	4.1	35	11.2	35	0.0	0	0.0	0
	Point-71	1	473	84.8	40	4.1	35	11.2	35	0.0	0	0.0	0
	Point-73	2	473	84.8	40	4.1	35	11.2	35	0.0	0	0.0	0
	Point-75	3	473	84.8	40	4.1	35	11.2	35	0.0	0	0.0	0
	Point-77	4	473	84.8	40	4.1	35	11.2	35	0.0	0	0.0	0
	Point-79	5	473	84.8	40	4.1	35	11.2	35	0.0	0	0.0	0
	Point-81	6	473	84.8	40	4.1	35	11.2	35	0.0	0	0.0	0
	Point-83	7	473	84.8	40	4.1	35	11.2	35	0.0	0	0.0	0
	Point-85	8	473	84.8	40	4.1	35	11.2	35	0.0	0	0.0	0
	Point-87	9	473	84.8	40	4.1	35	11.2	35	0.0	0	0.0	0
	Point-89	10	473	84.8	40	4.1	35	11.2	35	0.0	0	0.0	0
	Point-91	11	473	84.8	40	4.1	35	11.2	35	0.0	0	0.0	0
	Point-93	12	473	84.8	40	4.1	35	11.2	35	0.0	0	0.0	0
Northbound Riverside Avenue	Point-94	0	913	91.6	40	2.1	35	6.3	35	0.0	0	0.0	0
	Point-95	1	1169	91.6	40	2.1	35	6.3	35	0.0	0	0.0	0
	Point-99	3	1169	91.6	40	2.1	35	6.3	35	0.0	0	0.0	0
	Point-101	4	1169	91.6	40	2.1	35	6.3	35	0.0	0	0.0	0
Southbound Industrial Drive	Point-125	1	53	90.0	40	0.0	0	10.0	35	0.0	0	0.0	0
	Point-127	2	53	90.0	40	0.0	0	10.0	35	0.0	0	0.0	0
	Point-129	3	53	90.0	40	0.0	0	10.0	35	0.0	0	0.0	0
	Point-131	4	23	90.0	40	0.0	0	10.0	35	0.0	0	0.0	0
	Point-133	5	23	90.0	40	0.0	0	10.0	35	0.0	0	0.0	0
	Point-137	7	23	90.0	40	0.0	0	10.0	35	0.0	0	0.0	0
Northbound Industrial Drive	Point-138	0	72	90.0	40	0.0	0	10.0	35	0.0	0	0.0	0
	Point-139	1	72	90.0	40	0.0	0	10.0	35	0.0	0	0.0	0
	Point-141	2	36	90.0	40	0.0	0	10.0	35	0.0	0	0.0	0

	Point-143	3	36	90.0	40	0.0	0	10.0	35	0.0	0	0.0	0
	Point-145	4	36	90.0	40	0.0	0	10.0	35	0.0	0	0.0	0
	Point-147	5	36	90.0	40	0.0	0	10.0	35	0.0	0	0.0	0
Westbound Fortuna Way	Point-151	2	9	60.0	25	0.0	0	40.0	20	0.0	0	0.0	0
	Point-153	3	9	60.0	25	0.0	0	40.0	20	0.0	0	0.0	0
Eastbound Fortuna Way	Point-154	0	74	60.0	25	0.0	0	40.0	25	0.0	0	0.0	0
	Point-155	1	74	60.0	25	0.0	0	40.0	25	0.0	0	0.0	0

REPORT:	**INPUT TRAFFIC FOR TNM VEHICLES (LAeq)**		
TNM VERSION:	3.0.7.60002	REPORT DATE:	14 July 2020
CALCULATED WITH:	3.0.7.60002	CALCULATION DATE:	7/14/2020 4:22:24 PM
CASE:	Angelus Block Existing+Growth + Project	ORGANIZATION:	NV5
PATH:		ANALYSIS BY:	cecile.felsher
CALCULATION SEQUENCE NUMBER:		TNM SERIAL NUMBER:	
		PROJECT/CONTRACT:	

Roadway Name	Road Segment			Auto		Medium Truck		Heavy Truck		Bus		Motorcycle	
	Start Point		Total Volume	Percent	Speed	Percent	Speed	Percent	Speed	Percent	Speed	Percent	Speed
	Name	No.	[Veh/hr]	[%]	[mph]	[%]	[mph]	[%]	[mph]	[%]	[mph]	[%]	[mph]
Eastbound Agua Mansa Rd	Point-1	0	191	91.0	40	4.0	35	4.0	35	0.0	0	0.0	0
	Point-3	1	191	91.0	40	4.0	35	4.0	35	0.0	0	0.0	0
	Point-5	2	191	91.0	40	4.0	35	4.0	35	0.0	0	0.0	0
	Point-7	3	191	91.0	40	4.0	35	4.0	35	0.0	0	0.0	0
	Point-9	4	191	91.0	40	4.0	35	4.0	35	0.0	0	0.0	0
	Point-11	5	191	91.0	40	4.0	35	4.0	35	0.0	0	0.0	0
	Point-13	6	191	91.0	40	4.0	35	4.0	35	0.0	0	0.0	0
	Point-61	7	191	91.0	40	4.0	35	4.0	35	0.0	0	0.0	0
	Point-63	8	191	91.0	40	4.0	35	4.0	35	0.0	0	0.0	0
	Point-65	9	191	91.0	40	4.0	35	4.0	35	0.0	0	0.0	0
	Point-67	10	191	91.0	40	4.0	35	4.0	35	0.0	0	0.0	0
	Point-69	11	191	91.0	40	4.0	35	4.0	35	0.0	0	0.0	0
Southbound Riverside Avenue	Point-36	0	1157	86.0	40	4.0	35	10.0	35	0.0	0	0.0	0
	Point-37	1	1157	86.0	40	4.0	35	10.0	35	0.0	0	0.0	0
	Point-41	3	1272	86.0	40	4.0	35	10.0	35	0.0	0	0.0	0
	Point-45	5	1272	86.0	40	4.0	35	10.0	35	0.0	0	0.0	0
Westbound Agua Mansa Rd	Point-70	0	481	85.0	40	4.0	35	11.0	35	0.0	0	0.0	0
	Point-71	1	481	85.0	40	4.0	35	11.0	35	0.0	0	0.0	0
	Point-73	2	481	85.0	40	4.0	35	11.0	35	0.0	0	0.0	0
	Point-75	3	481	85.0	40	4.0	35	11.0	35	0.0	0	0.0	0
	Point-77	4	481	85.0	40	4.0	35	11.0	35	0.0	0	0.0	0
	Point-79	5	481	85.0	40	4.0	35	11.0	35	0.0	0	0.0	0
	Point-81	6	481	85.0	40	4.0	35	11.0	35	0.0	0	0.0	0
	Point-83	7	481	85.0	40	4.0	35	11.0	35	0.0	0	0.0	0
	Point-85	8	481	85.0	40	4.0	35	11.0	35	0.0	0	0.0	0
	Point-87	9	481	85.0	40	4.0	35	11.0	35	0.0	0	0.0	0
	Point-89	10	481	85.0	40	4.0	35	11.0	35	0.0	0	0.0	0
	Point-91	11	481	85.0	40	4.0	35	11.0	35	0.0	0	0.0	0
	Point-93	12	481	85.0	40	4.0	35	11.0	35	0.0	0	0.0	0
Northbound Riverside Avenue	Point-94	0	963	92.0	40	2.0	35	6.0	35	0.0	0	0.0	0
	Point-95	1	1169	92.0	40	2.0	35	6.0	35	0.0	0	0.0	0
	Point-99	3	1169	92.0	40	2.0	35	6.0	35	0.0	0	0.0	0
	Point-101	4	1169	92.0	40	2.0	35	6.0	35	0.0	0	0.0	0
Southbound Industrial Drive	Point-125	1	153	90.0	40	0.0	0	10.0	35	0.0	0	0.0	0
	Point-127	2	153	90.0	40	0.0	0	10.0	35	0.0	0	0.0	0
	Point-129	3	153	90.0	40	0.0	0	10.0	35	0.0	0	0.0	0
	Point-131	4	38	90.0	40	0.0	0	10.0	35	0.0	0	0.0	0
	Point-133	5	38	90.0	40	0.0	0	10.0	35	0.0	0	0.0	0
	Point-137	7	38	90.0	40	0.0	0	10.0	35	0.0	0	0.0	0
Northbound Industrial Drive	Point-138	0	123	90.0	40	0.0	0	10.0	35	0.0	0	0.0	0
	Point-139	1	123	90.0	40	0.0	0	10.0	35	0.0	0	0.0	0
	Point-141	2	66	90.0	40	0.0	0	10.0	35	0.0	0	0.0	0

	Point-143	3	66	90.0	40	0.0	0	10.0	35	0.0	0	0.0	0
	Point-145	4	66	90.0	40	0.0	0	10.0	35	0.0	0	0.0	0
	Point-147	5	66	90.0	40	0.0	0	10.0	35	0.0	0	0.0	0
Westbound Fortuna Way	Point-151	2	19	60.0	25	0.0	0	40.0	20	0.0	0	0.0	0
	Point-153	3	19	60.0	25	0.0	0	40.0	20	0.0	0	0.0	0
Eastbound Fortuna Way	Point-154	0	225	60.0	25	0.0	0	40.0	25	0.0	0	0.0	0
	Point-155	1	225	60.0	25	0.0	0	40.0	25	0.0	0	0.0	0

REPORT:	**Results: Sound Levels - No Barrier Objects**		
TNM VERSION	3.0.7.60002	REPORT DATE:	14 July 2020
CALCULATED WITH:	3.0.7.60002	CALCULATION DATE:	7/14/2020 4:07:53 PM
CASE:	Angelus Block (Existing + Growth)	ORGANIZATION:	NV5
UNITS:	English	ANALYSIS BY:	cecile.felsher
DEFAULT GROUND TYPE:	HardSoil	PROJECT/CONTRACT	
ATMOSPHERICS:	68°F, 50%	Average pavement type shall be used unless a state highway agency substantiates the use of a different type with approval FHWA.	
PAVEMENT TYPE(S) USED:	Average		

Receiver				Modeled Traffic Noise Levels				
				LAeq		Increase over Existing		
Name	No.	Nb. R.R.	Existing LAeq	Calc.	Absolute Criterion	Calc.	Relative Criterion	Type of Impact
			dBA	dBA	dBA	dBA	dBA	
Receiver-1	1	1	---	63.2	0.0	---	---	Sound Level

REPORT: **Results: Sound Levels - No Barrier Objects**

TNM VERSION	3.0.7.60002	REPORT DATE:	14 July 2020
CALCULATED WITH:	3.0.7.60002	CALCULATION DATE:	7/14/2020 4:22:24 PM
CASE:	Angelus Block Existing+ Growth + Project	ORGANIZATION:	NV5
UNITS:	English	ANALYSIS BY:	cecile.felsher
DEFAULT GROUND TYPE:	HardSoil	PROJECT/CONTRACT	
ATMOSPHERICS:	68°F, 50%	Average pavement type shall be used unless a state highway agency substantiates the use of a different type with approval FHWA.	
PAVEMENT TYPE(S) USED:	Average		

Receiver				Modeled Traffic Noise Levels				
				LAeq		Increase over Existing		
Name	No.	Nb. R.R.	Existing LAeq	Calc.	Absolute Criterion	Calc.	Relative Criterion	Type of Impact
			dBA	dBA	dBA	dBA	dBA	
Receiver-1	1	1	---	63.2	0.0	---	---	Sound Level

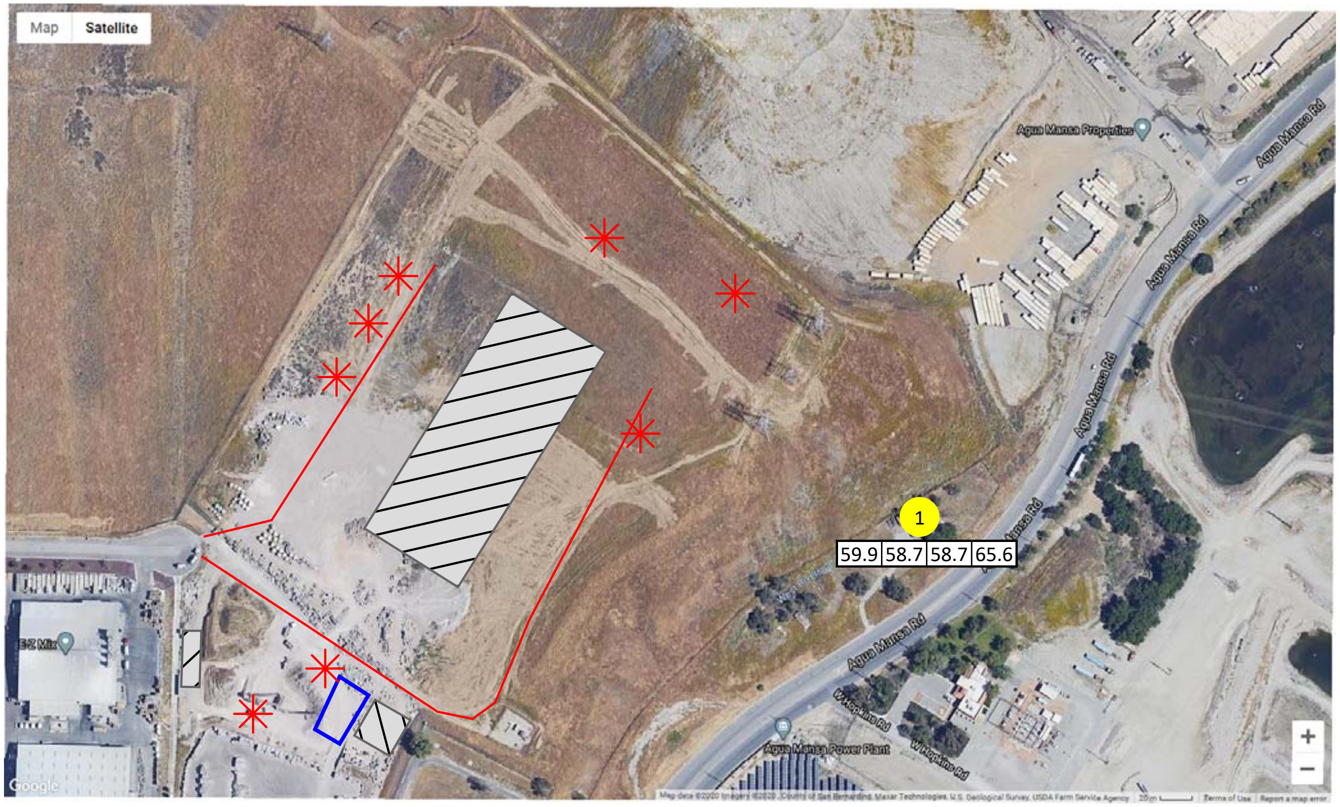
Noise emissions of industry sources

Source name	Reference	Level		63	125	250	500	1	2	4	8	Cwall	CI	CT
				Frequency spectrum [dB(A)]								Corrections		
			dB(A)	Hz	Hz	Hz	Hz	kHz	kHz	kHz	kHz	dB	dB	dB
Front Loader	Lw/unit	Day	112.9	84.8	100.9	111.4	104.7	99.0	98.2	93.0	84.9	-	-	-
		Evening	-	-	-	-	-	-	-	-	-	-	-	-
		Night	-	-	-	-	-	-	-	-	-	-	-	-
Forklift	Lw/unit	Day	100.0	81.6	85.6	89.6	92.6	95.6	93.6	88.6	83.6	-	-	-
		Evening	100.0	81.6	85.6	89.6	92.6	95.6	93.6	88.6	83.6	-	-	-
		Night	100.0	81.6	85.6	89.6	92.6	95.6	93.6	88.6	83.6	-	-	-
	Lw/unit	Day	100.0	81.6	85.6	89.6	92.6	95.6	93.6	88.6	83.6	-	-	-
		Evening	100.0	81.6	85.6	89.6	92.6	95.6	93.6	88.6	83.6	-	-	-
		Night	100.0	81.6	85.6	89.6	92.6	95.6	93.6	88.6	83.6	-	-	-
	Lw/unit	Day	100.0	81.6	85.6	89.6	92.6	95.6	93.6	88.6	83.6	-	-	-
		Evening	100.0	81.6	85.6	89.6	92.6	95.6	93.6	88.6	83.6	-	-	-
		Night	100.0	81.6	85.6	89.6	92.6	95.6	93.6	88.6	83.6	-	-	-
	Lw/unit	Day	100.0	81.6	85.6	89.6	92.6	95.6	93.6	88.6	83.6	-	-	-
		Evening	100.0	81.6	85.6	89.6	92.6	95.6	93.6	88.6	83.6	-	-	-
		Night	100.0	81.6	85.6	89.6	92.6	95.6	93.6	88.6	83.6	-	-	-
	Lw/unit	Day	100.0	81.6	85.6	89.6	92.6	95.6	93.6	88.6	83.6	-	-	-
		Evening	100.0	81.6	85.6	89.6	92.6	95.6	93.6	88.6	83.6	-	-	-
		Night	100.0	81.6	85.6	89.6	92.6	95.6	93.6	88.6	83.6	-	-	-
	Lw/unit	Day	100.0	81.6	85.6	89.6	92.6	95.6	93.6	88.6	83.6	-	-	-
		Evening	100.0	81.6	85.6	89.6	92.6	95.6	93.6	88.6	83.6	-	-	-
		Night	100.0	81.6	85.6	89.6	92.6	95.6	93.6	88.6	83.6	-	-	-
Forklift	Lw/unit	Day	100.0	81.6	85.6	89.6	92.6	95.6	93.6	88.6	83.6	-	-	-
		Evening	100.0	81.6	85.6	89.6	92.6	95.6	93.6	88.6	83.6	-	-	-
		Night	100.0	81.6	85.6	89.6	92.6	95.6	93.6	88.6	83.6	-	-	-
Trucks - Entrance Path	Lw/m	Day	77.0	58.5	62.5	66.5	69.5	72.5	70.5	65.5	60.5	-	-	-
		Evening	77.0	58.5	62.5	66.5	69.5	72.5	70.5	65.5	60.5	-	-	-
		Night	77.0	58.5	62.5	66.5	69.5	72.5	70.5	65.5	60.5	-	-	-
Trucks - Exit Path	Lw/m	Day	77.0	58.5	62.5	66.5	69.5	72.5	70.5	65.5	60.5	-	-	-
		Evening	77.0	58.5	62.5	66.5	69.5	72.5	70.5	65.5	60.5	-	-	-
		Night	77.0	58.5	62.5	66.5	69.5	72.5	70.5	65.5	60.5	-	-	-

Alta Environmental 3777 Long Beach Blvd Long Beach, CA 90807 USA

Noise emissions of parking lot traffic

Name	Parking lot type	Size	Movements per hour			Road surface	Separated method	Lw,ref
			Day	Evening	Night			dB(A)
Employee and customer parki	P+R, near town	40 Parking bays	1.000	0.000	1.000	Asphaltic driving lanes	no	82.7



Angelus Block - Rialto, CA

Noise level predictions at sensitive receptor

Signs and symbols

Receiver

Point source

Line source

Parking lot

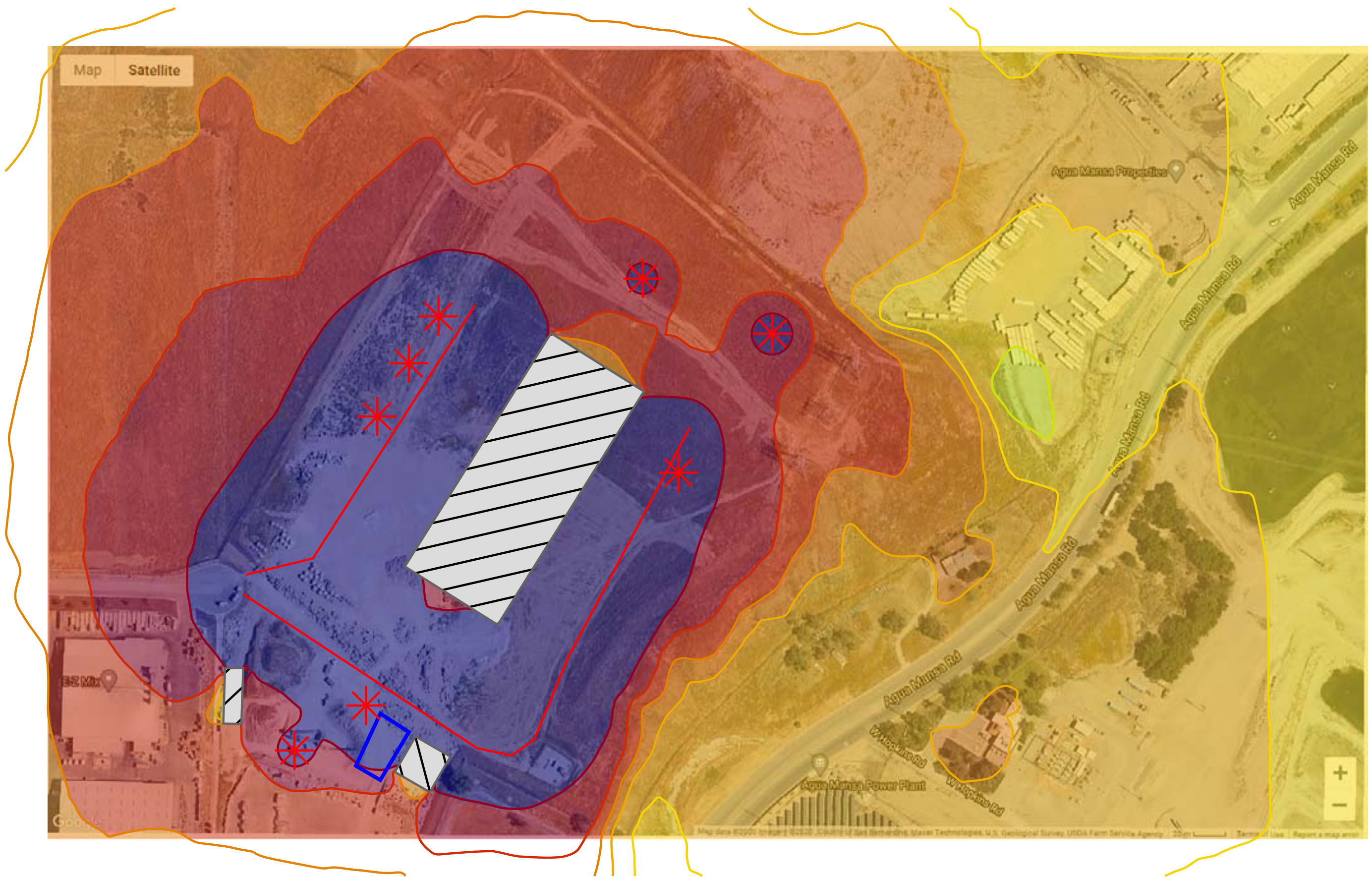
1 : 392

0 100 200 400 600 800 feet

ALTA ENVIRONMENTAL

Angelus Block
Rialto, CA
Operational Stationary Noise

Noise level contours - CNEL



Signs and symbols

- Point source
- Line source
- Parking lot

Levels in dB(A)

<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
> 80

1 : 392

0 100 200 400 600 800 feet

N

ALTA
ENVIRONMENTAL

Appendix H

Traffic and Transportation Analysis

TRAFFIC IMPACT STUDY FOR

ANGELUS BLOCK CO., INC. PROPOSED MANUFACTURING FACILITY

DATE:
September 6, 2021

LOCATION:
Rialto, California

PREPARED FOR:
City of Rialto, California

PREPARED BY:
NV5 Engineers and Consultants, Inc.
Contact: Victoria Guobaitis, PE, PTOE, TE
1655 Canton St. Suite G
Roswell, GA 30075
678-795-3633
Victoria.Guobaitis@NV5.com

NV5
nv5.com

CONTENTS

LIST OF TABLES

LIST OF FIGURES

A. Introduction

A.1. Purpose of the TIA and Study Objectives

This Traffic Impact Analysis has been prepared to address the traffic-related impacts of the proposed Angelus Block Co. manufacturing facility in the City of Rialto.

This traffic study has been conducted in accordance with the City of Rialto's *Traffic Impact Analysis Report Guidelines and Requirements* (December 2013), and in accordance with the San Bernardino County Transportation Authority (SBCTA) Congestion Management Program (CMP). A scoping agreement with the City of Rialto is included in Appendix A.

This report includes a description of existing traffic conditions in the surrounding area, estimated project trip generation and distribution, future traffic growth, and an assessment of project-related impacts on the roadway system. Where necessary, circulation system improvements have been identified to achieve acceptable intersection operation in the vicinity of the project.

This project will be evaluated for the following conditions:

- Existing Conditions 2020
- Opening Year 2022
- Opening Year 2022 Plus Project
- Opening Year 2022 Cumulative
- Opening Year 2022 Cumulative Plus Project

A.2. Site Plan Location and Study Area

The proposed site is located east of S Riverside Avenue and north of Agua Mansa Road in the southern part of Rialto. The site is located approximately 1.5 miles south of Interstate 10 (I-10). Land use in the area is primarily industrial and manufacturing within the study area. Figure 1 on the next page shows the site location relative to the nearby transportation network. A stand-alone figure is included in the Appendix B.

A.3. Development Project Identification

Per the site plan dated 02/10/2021, the parcels proposed for development are as follows:

- Parcel 0260-061-67-0000
- Parcel 0260-061-41-0000
- Parcel 0260-061-42-0000

A.4. Development Project Description

The site is located within the Agua Mansa Specific Plan. The industrial corridor is 4,285 acres, located south of I-10 and west of I-215 on the western bank of the Santa Ana River. The corridor is approved for a variety of land uses, including industrial, agricultural, and residential.

Figure 1. Vicinity Map

The proposed site is located on the 8th subset within the Agua Mansa Specific Plan which is consisted of primarily general industry land-use with minimal residential. The project will involve the construction of a manufacturing plant building with 135,581 square feet, an office building with 10,018 square feet, a storage warehouse with 14,160 square feet, a mechanical shop with 7,200 square feet and a metal canopy with 21,534 square feet. The total area of these site components is 188,493 square feet. A copy of the site plan is provided on Figure 2. A full plan sheet is included in the Appendix C.

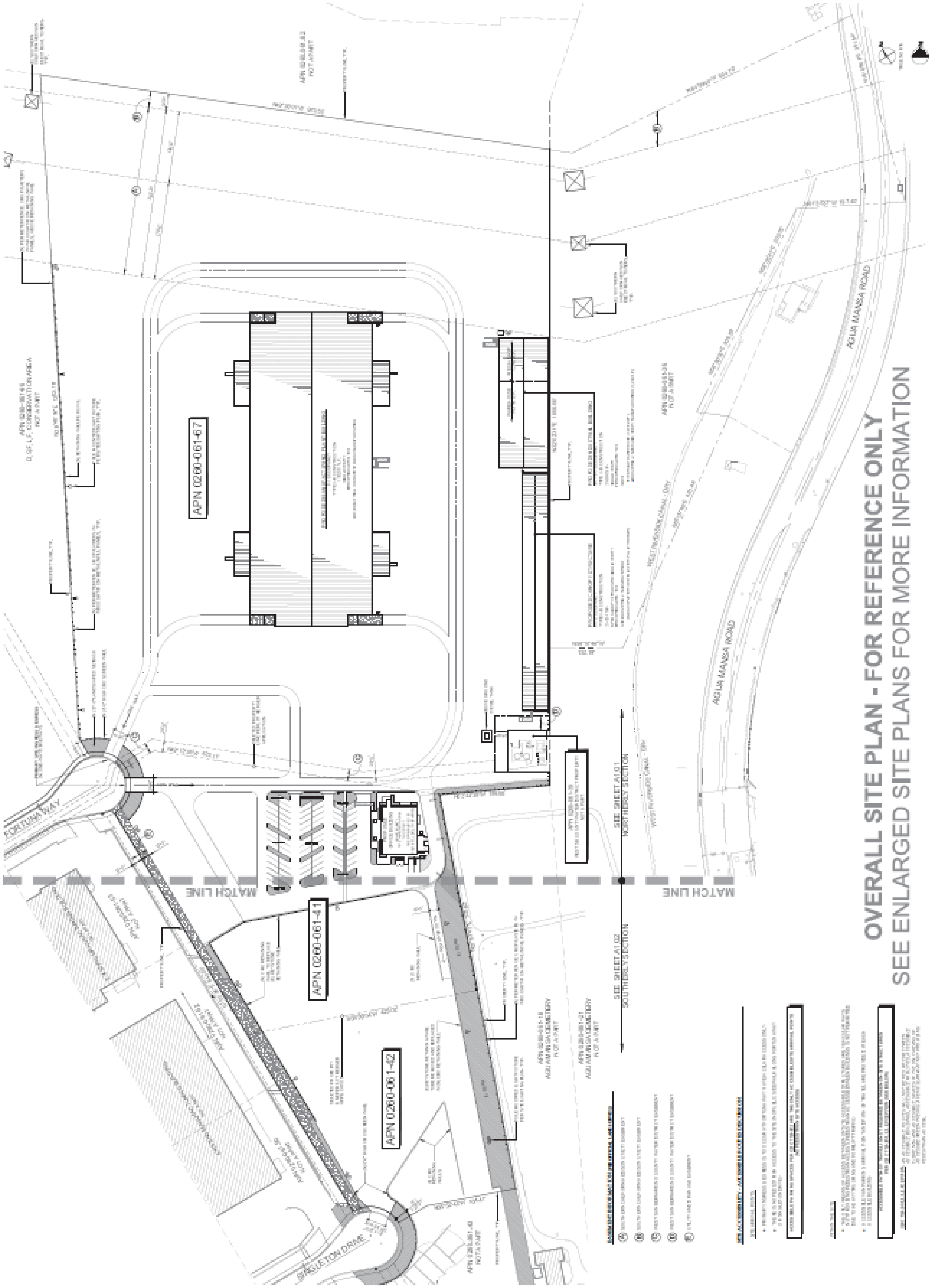
Access to the site is provided via a cul-de-sac at the end of Fortuna Way. There are two one-way driveways spaced out within this cul-de-sac: one for entering and one for exiting. A secondary entrance is located at the end of Singleton Drive at the southern portion of the proposed site. This entrance is dedicated to construction vehicles and will not be used for daily operations once construction of the site is complete.

The proposed site is expected to be completed in 2022 in a single phase. The location of the site as well as the study area is located with the City of Rialto and San Bernardino County. The site is also located within the sphere of influence of, or 1-mile from, the City of Colton and the City of Jurupa Valley.

A.5. Proposed Site Operations

The operation of the site includes the manufacturing of concrete blocks. Raw materials arrive in trucks (i.e., cement, sand) and are unloaded into the proposed manufacturing plant building. The raw materials are mixed accordingly and poured into block forms to cure inside this building. Once curing is complete, the blocks are either purchased and hauled off-site or moved to the canopy structure for secondary processing. Secondary processing includes some customization of the concrete blocks before they are either stored or purchased. The warehouse building, as designated in the plans, stores materials that are used throughout the site. The mechanical shop is where machinery is maintained and stored when not in use (i.e., forklifts). The office building on site supports the use of the rest of the site. It would house administrative offices for the operations as well as facilitate the selling of the final product.

Figure 2. Site Plan



A.6. Analysis Methodology

A.6.1. Intersection Analysis – HCM Methodology

Peak hour intersection operations at signalized and unsignalized intersections were evaluated using the methods prescribed in the Highway Capacity Manual (HCM) 6th Edition, consistent with the requirements of the City of Rialto *Traffic Impact Analysis Report Guidelines and Requirements* and the San Bernardino County CMP.

The City of Rialto *Traffic Impact Analysis Report Guidelines and Requirements* requires analysis of traffic operations to be based on the vehicular delay methodologies of the Highway Capacity Manual (HCM). The intersection analysis for the proposed project has been accomplished using the Synchro 11 software program and using specified input parameters outlined in the City's *Traffic Impact Analysis Report Guidelines and Requirements*.

Per the HCM Methodology, Level of Service (LOS) for signalized intersections is defined in terms of average vehicle delay. Specifically, LOS criteria are stated in terms of the average control delay per vehicle for the peak 15-min period within the hour analyzed. Table 1 on the following pages provide a description of the operating characteristics of each Level of Service. Tables 2 defines the LOS in terms of average seconds of delay for signalized and unsignalized intersections.

A.6.2. Level of Service Standards and Measure of Significance.

The City of Rialto *Traffic Impact Analysis Report Guidelines and Requirements* references the General Plan minimum Level of Service standards. According to Policy 4-1.20 of the General Plan document, city streets with signalized intersections are required to operate at LOS D or better during peak hours. The one exception being Riverside Avenue which can operate at LOS E, Riverside Avenue is part of this study. Policy 4-1.21 of the General Plan document states that unsignalized intersections operate with the average delay being 120 seconds or less during the peak hours. The City's *Traffic Impact Analysis Report Guidelines and Requirements* requires a new development to mitigate impacts that cause the Level of Service to fall below LOS D (E for Riverside Avenue), or the peak hour delay to increase as follows:

- LOS A/B – by 10.0 seconds
- LOS C – by 8.0 seconds
- LOS D – by 5.0 seconds
- LOS E – by 2.0 seconds
- LOS F – by 1.0 second

Table 1: Level of Service Definitions, Highway Capacity Manual (HCM), 6th Edition

LEVEL OF SERVICE DEFINITIONS	
Level of Service	**Description**
A	No approach phase is fully utilized by traffic and no vehicle waits longer than one red indication. Typically, the approach appears quite open, turns are made easily and nearly all drivers find freedom of operation.
B	This service level represents stable operation, where an occasional approach phase is fully utilized and a substantial number are approaching full use. Many drivers begin to feel restricted within platoons of vehicles.
C	This level still represents stable operating conditions. Occasionally drivers may have to wait through more than one red signal indication, and backups may develop behind turning vehicles. Most drivers feel somewhat restricted but not objectionably so.
D	This level encompasses a zone of increasing restriction, approaching instability at the intersection. Delays to approaching vehicles may be substantial during short peaks within the peak period; however, enough cycles with lower demand occur to permit periodic clearance of developing queues, thus preventing excessive backups.
E	Capacity occurs at the upper end of this service level. It represents the most vehicles that any particular intersection approach can accommodate. Full utilization of every signal cycle is seldom attained no matter how great the demand.
F	This level describes forced flow operations at low speeds, where volumes exceed capacity. These conditions usually result from queues of vehicles backing up from a restriction downstream. Speeds are reduced substantially, and stoppages may occur for short or long periods of time due to the congestion. In the extreme case, both speed and volume can drop to zero.

Table 2: Level of Service Criteria, Highway Capacity Manual (HCM), 6th Edition

LEVEL OF SERVICE CRITERIA FOR SIGNALIZED AND UNSIGNALIZED INTERSECTIONS		
Level of Service	**Signalized Intersection[1]**	**Unsignalized Intersection[2]**
A	≤ 10	0-10
B	> 10 - 20	> 10 - 15
C	> 20 - 35	> 15 - 25
D	> 35 - 55	> 25 - 35
E	> 55 - 80	> 35 - 50
F	> 80	> 50

[1]Source: Highway Capacity Manual (HCM 6th Edition), Exhibit 19-8, Average Delay in Seconds/Vehicle
[2]Source: Highway Capacity Manual (HCM 6th Edition), Exhibit 20-2, Average Delay in Seconds/Vehicle

A.6.1. Roadway Segment Analysis

The roadway segment analysis will address the project's impact on daily operating conditions on roadway segments within the project vicinity. Roadway segments are evaluated by comparing the daily traffic volume on the roadway segment to the daily capacity of that segment, to determine the volume-to-capacity (v/c) ratio. Daily capacity is based on the roadway classification, as shown in Table 3.

Table 3: Level of Service Criteria, Segments

CITY OF RIALTO CAPACITY[1]				
Roadway Capacity	No. of Lanes	Two-Way Traffic Volume (ADT)[2]		
		Service Level C	Service Level D	Service Level E
Local	2	2,500-2,799	2,800-3,099	3,100 +
Collector (60' or 64')	2	9,900-11,199	11,200-12,499	12,500 +
Industrial (45')	2	9,900-11,199	11,200-12,499	12,500 +
Arterial [3]	2	14,400-16,199	16,200-17,999	18,000 +
Secondary Highway	4	16,900-19,399	19,400-21,999	22,000 +
Modified Arterial (100')	4	26,200-29,599	29,600-32,999	33,000 +
Arterial (120')	6	38,700-44,099	44,100-49,499	49,500 +

[1]All capacity figures are based on optimum conditions and are intended as guidelines for planning purposes only
[2]Maximum two-way ADT values are based on the 1999 Modified Highway Capacity Manual Level of Service Tables.
[3]Two-lane roads designated as future arterials that conform to arterial design standards for vertical and horizontal alignments are analyzed as arterials.
Source: City of Rialto Traffic Impact Analysis Report Guidelines and Requirements (2013)

Based on the General Plan document, all segments must operate at LOS D or better. The exception to that rule is Riverside Avenue between the Metrolink Tracks to the southern border of the City of Rialto. Between these points, Riverside Avenue can operate at LOS E. The table above does not include an upper limit of capacity for a roadway segment to operate at LOS E. As a result, this limit was extrapolated by calculating the difference between the other limits of each roadway class. The study segments include modified arterial (100') and arterial (120'). The difference between LOS C and D was calculated and that value was applied to the lower LOS limit. Arterial (120') changes by 5,400 vehicles, which means the upper threshold of LOS E is ***54,900***. Modified Arterial (100') changes by 3,400 vehicles, which means the upper threshold for LOS E is ***36,400***. These values will be used as the capacity of the Riverside Avenue segments per the General Plan document.

B. Area Conditions

B.1. Identify Study Area and Intersections

The study includes a discussion of existing (2020) traffic volumes, future (2022) traffic volumes, trip generation, directional distribution, and the impacts of new traffic at the study intersections.

The scope of this traffic impact analysis was coordinated with staff from the City of Rialto. This study includes analysis of the Existing Conditions, Existing Plus Growth (also known as Opening Year) Conditions, Opening Year Plus Project Trips, Opening Year Plus Cumulative Growth (trips associated with developments to be constructed between the date of this report and project completion), and finally Opening Year Plus Cumulative Growth Plus Project Trips for the following locations:

1. S Riverside Avenue at W Valley Boulevard
2. S Riverside Avenue at I-10 WB ramps
3. S Riverside Avenue at I-10 EB ramps
4. S Riverside Avenue at Slover Avenue
5. S Riverside Avenue at Santa Ana Avenue
6. S Riverside Avenue at Industrial Drive
7. S Riverside Avenue at Jurupa Avenue
8. S Riverside Avenue at Resource Drive/Industrial Drive
9. S Riverside Avenue at Singleton Drive
10. S Riverside Avenue at Agua Mansa Road
11. Industrial Drive at Fortuna Way
12. Resource Drive at Enterprise Drive
13. S Riverside Avenue: I-10 WB ramps to I-10 EB ramps
14. S Riverside Avenue: I-10 EB ramps to Slover Avenue
15. S Riverside Avenue: Slover Avenue to Santa Ana Avenue
16. S Riverside Avenue: Santa Ana Avenue to Industrial Drive
17. S Riverside Avenue: Resource Drive to Agua Mansa Road

The report summarizes the data collected, background and projected traffic at the study locations, analysis of traffic impacts including levels of service (LOS), assessment of the site entrance, and conclusions/recommendations from the analysis.

Appendix C includes a copy of the site development concept plan.

B.2. Description of Existing Roads, Traffic Controls, and Intersection Geometries

The site will be accessed primarily via I-10 approximately 1.5 miles north of the site. I-10 serves as the primary east-west freeway and connects the site eastward toward San Bernardino and westward toward Los Angeles. Further description of all roadways within the study area are summarized below.

Existing lane configuration and intersection control at the study intersections was confirmed in a site visit conducted in April 2020. Figure 3 summarizes both lane configurations and intersection control as verified in April 2020. This information was then used to build a model to conduct the operational analysis of the study area.

Interstate 10 (I-10) Ramps are exit and entrance ramps to I-10 an east-west freeway that has a posted speed limit of 70 MPH. The entrance ramps are metered and have one high occupancy vehicle (HOV) lane and two general purpose lanes at the intersection with S Riverside Ave. The exit ramps have three general purpose lanes at the intersection of S Riverside Ave.

South Riverside Avenue is a north-south road designated as a Modified Major Arterial II as classified by the General Plan for the City of Rialto (December 2010). A modified Major Arterial II has three lanes of travel in each direction with medians to accommodate the heavy traffic flow near freeway intersections, intersections 1 and 2. Near the project site S Riverside has two lanes of travel in each direction with a two-way left-turn lane (TWLTL) median. South of Santa Ana Road the posted speed is 55 MPH, north of Santa Ana Road the posted speed limit is 50 MPH. S Riverside Avenue connects to Interstate 10, State Route 66, and State Route 210 to the north of the project site. To the south S Riverside Ave changes to Main Street. S Riverside Avenue is also classified as a Terminal Access truck route.

Agua Mansa Road is a northeast-southwest road designated as a Major Arterial by the General Plan for the City of Rialto (December 2010). A Major Arterial has at least two lanes of travel in each direction and parking lanes. Near the project site Agua Mansa Road has two lanes heading westbound and one lane heading eastbound. It has a posted speed limit of 45 MPH.

Slover Avenue is an east-west road designated as a Major Arterial by the General Plan for the City of Rialto (December 2010). Near the project site Slover Avenue has two lanes of travel in each direction with a two-way left-turn lane (TWLTL) to the west of S Riverside Avenue and two lanes of travel westbound and one lane of travel eastbound to the east of S Riverside Ave. It has a posted speed limit of 45 MPH. Slover Ave is a Terminal Access truck route.

Santa Ana Avenue is an east-west road designated as a Secondary Arterial to the west of S Riverside Ave and a Collector Street to the east. Santa Ana Avenue has one lane of travel in each direction. It has a posted speed limit of 40 MPH. Santa Ana Avenue is a Terminal Access truck route.

Industrial Drive is a north-south, approximately 0.7-mile, local street. Industrial Drive has no posted speed limit. For operational analysis, it is assumed to be 25 MPH. Industrial Drive is the connection from the project site to S Riverside Ave.

Fortuna Way is a 0.1-mile-long local road that serves as the only driveway to the project site connecting to Industrial Drive. There is no posted speed limit; therefore, for operational analysis, it is assumed to be 25 MPH.

Resource Drive is an approximately 0.4-mile-long local road. There is no posted speed limit; therefore, for our analysis it is assumed to be 25 MPH.

Enterprise Drive is an approximately 0.3-mile-long local road. There is no posted speed limit; therefore, for our analysis it is assumed to be 25 MPH.

B.3. Existing Traffic Volumes

Due to the state-mandated lock-down starting in March 2020 (implemented as a result of the COVID-19 pandemic), traffic patterns have been irregular near the proposed site. Obtaining new counts for what the traffic engineering industry constitutes as "normal" conditions has not been feasible. Because new traffic counts were not feasible, historic traffic counts taken before March of 2020 were obtained from the City of Rialto as well as from local traffic counting companies. All historic counts obtained are from 2018 or 2019. To establish an existing base year 2020 traffic network, a 2% growth rate per year was applied to the historic counts. All counts obtained are included in Appendix D.

Of the 12 intersections in the study area, historic counts were obtained for 9 of them. Figure 4 shows the lane configuration for the 12 intersections. Traffic counts for Industrial Drive at Fortuna Way, S Riverside Avenue at Singleton Drive, and Resource Drive at Enterprise Drive were not available. Counts associated with this intersection were estimated using the adjacent intersection approach and receiving volumes as well as an estimate of trip generation based adjacent land uses.

Turning movement counts from 2018 were obtained for the following study area intersections:

- S Riverside Avenue at I-10 WB ramps
- S Riverside Avenue at I-10 EB ramps
- S Riverside Avenue at Slover Avenue
- S Riverside Avenue at Santa Ana Avenue
- S Riverside Avenue at Industrial Drive
- S Riverside Avenue at Jurupa Avenue
- S Riverside Avenue at Resource Drive/Industrial Drive

Turning movement counts from 2019 were obtained for the following study area intersection:

- S Riverside Avenue at Agua Mansa Road

Turning movement counts from 2020 were obtained for the following study area intersection:

- S Riverside Avenue at W Valley Boulevard

Figure 3. Study Intersections

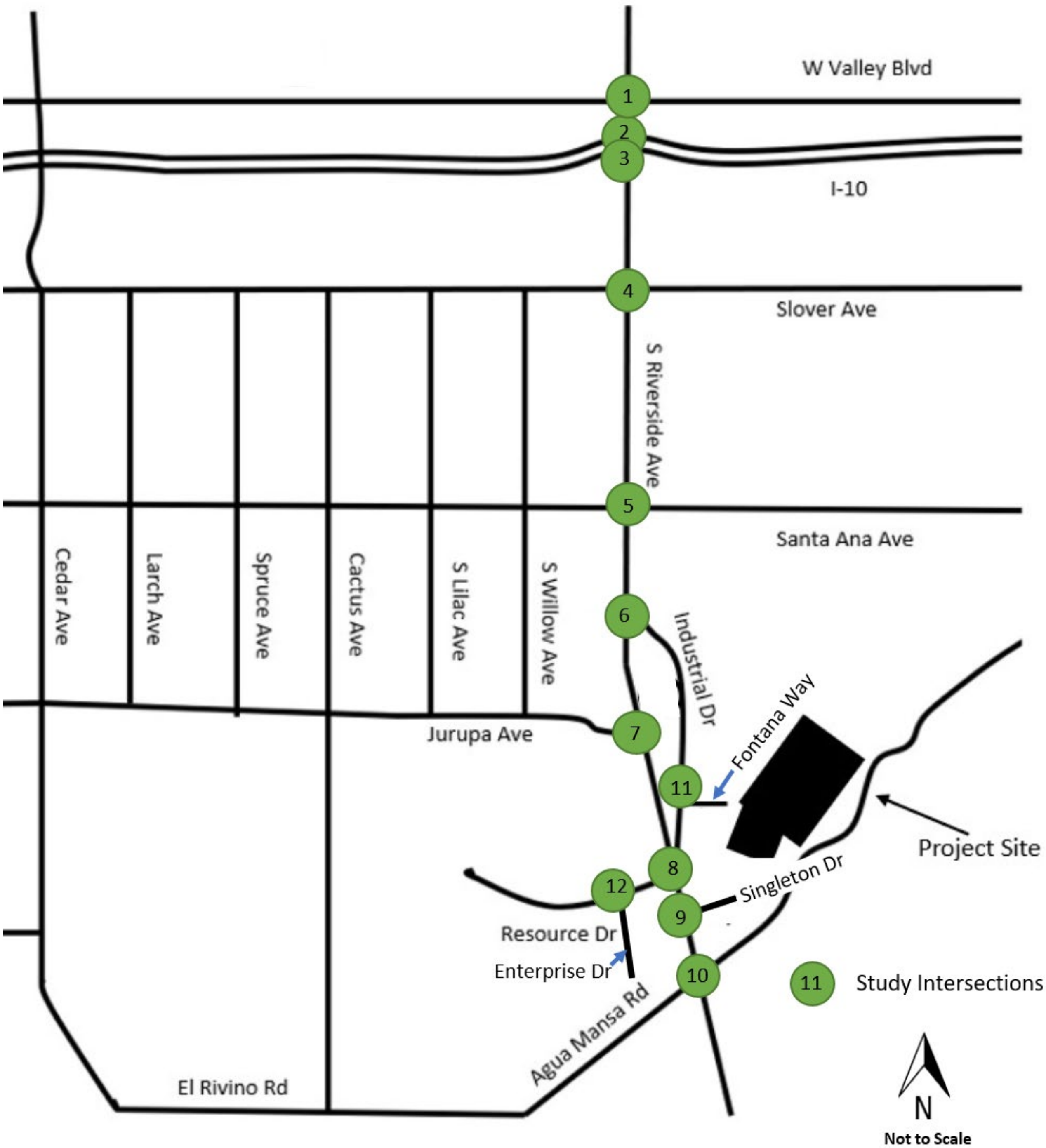
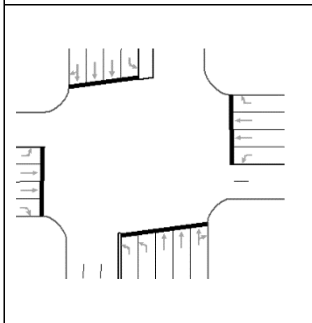
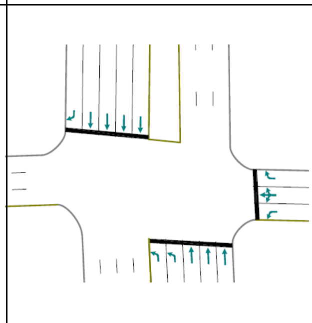
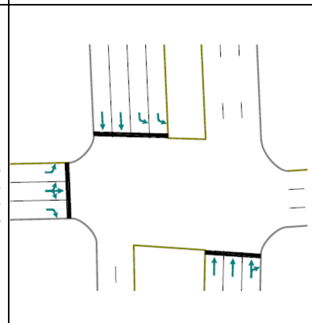
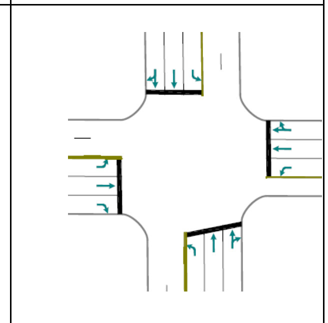
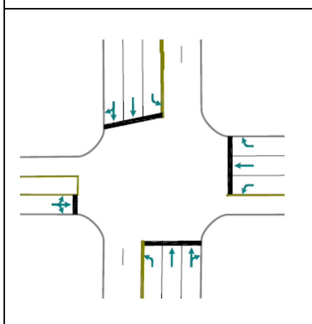
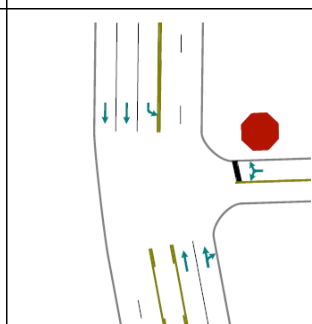
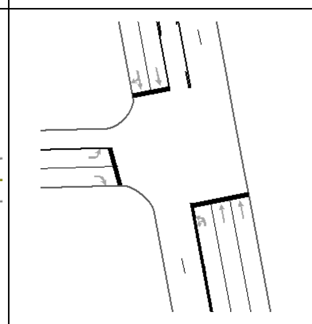
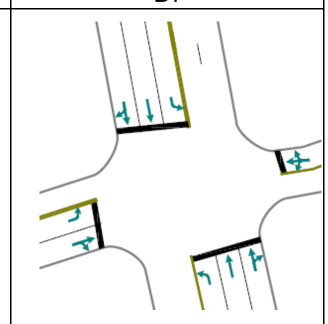
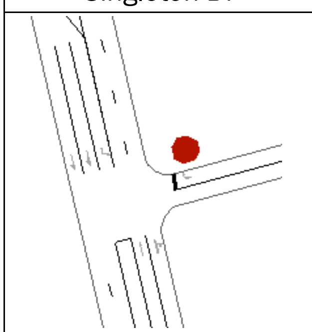
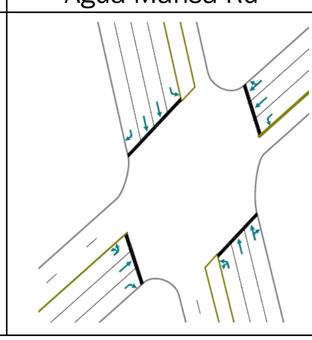
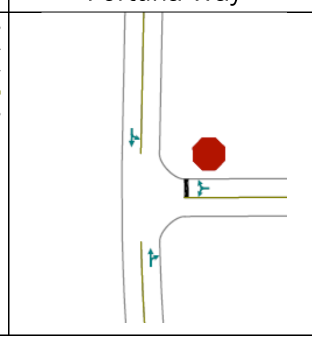
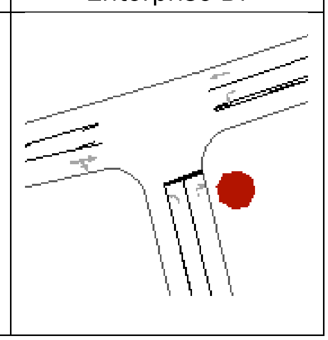


Figure 4. Existing Lane Configuration and Traffic Control

1. S Riverside Ave at W Valley Blvd	2. S Riverside Ave at I-10 WB Ramps	3. S Riverside Ave at I-10 EB Ramps	4. S Riverside Ave at Slover Ave
			
5. S Riverside Ave at Santa Ana Ave	6. S Riverside Ave at Industrial Dr	7. S Riverside Ave at Jurupa Ave	8. S Riverside Ave at Resource Dr/Industrial Dr
			
9. S Riverside at Singleton Dr	10. S Riverside Ave at Agua Mansa Rd	11. Industrial Dr at Fortuna Way	12. Resource Dr at Enterprise Dr
			

Of the five segments included in the segment analysis, historic traffic counts were obtained for two segments, both in 2018:

- S Riverside Avenue: I-10 EB ramps to Slover Avenue
- S Riverside Avenue: Slover Avenue to Santa Ana Avenue

Segment annual daily traffic (ADT) for the remaining three segments was estimated by calculating the k-factors for nearby segments. The k-factor is the ratio of peak hour traffic to the ADT of the same segment. This k-factor was then applied to the peak hour volumes of the unknown segments (from the turning movement counts) to obtain an estimated ADT.

Because the site is considered a “truck-intensive” land-use per the City of Rialto *Traffic Impact Analysis Report Guidelines and Requirements*, all existing traffic counts were converted to passenger car equivalent (PCE) trips. This process is used to incorporate heavy truck usage into the operational analysis of the transportation network. Truck classification information is needed to compute the PCE volumes. Due to the data constraints, only one segment included vehicle classifications for passenger vehicles and trucks. However, the intersection peak hour counts were classified by vehicle type. As a result, the total truck percentage and the average PCE factor was calculated for the adjacent intersections of each segment and averaged together to calculate a truck percentage and average PCE factor for each segment. The final PCE value was calculated using these averages. PCE values were developed with the City of Rialto *Traffic Impact Analysis Report Guidelines and Requirements* factors: 1.5 for 2-axle trucks, 2.0 for 3-axle trucks, and 3.0 for 4+ axle trucks. PCE volume worksheets are provided in Appendix E.

The data from these counts help to establish an overall picture of the existing traffic conditions within the study area. Figure 5 presents the existing (2020) traffic volumes for these locations.

B.4. Existing Delay and Level of Service

B.4.1. Peak Hour Intersection Operating Conditions

Intersection Level of Service analysis was conducted for the AM and PM peak hours using the analysis procedures described previously in this report. The results of the intersection analysis for Existing Conditions are shown in Table 1. Synchro outputs of Existing Conditions intersection analysis worksheets are provided in Appendix F.

Table 4 indicates that all study intersections are currently operating at an acceptable Level of Service—LOS E for intersections along Riverside Avenue and LOS D for the two intersections not on Riverside Avenue.

B.4.1. Daily Roadway Segment Operating Conditions

Roadway Level of Service analysis was conducted based on the roadway capacities presented previously in this report. The results of the roadway analysis for Existing Conditions are shown in Table 5.

Table 5 indicates that the study roadway segments are currently operating at capacities above the acceptable Level of Service threshold. This means that in existing conditions, no roadway segments meet the General Plan Guidelines.

B.5. Transit Service

Transit service in Rialto, California is provided by OmniTrans transit lines, which serve various San Bernardino cities in the area. There are no bus stops within half a mile of the project site based on the transit map from the General Plan shown in Figure 6.

Figure 5. Existing (2020) Volumes

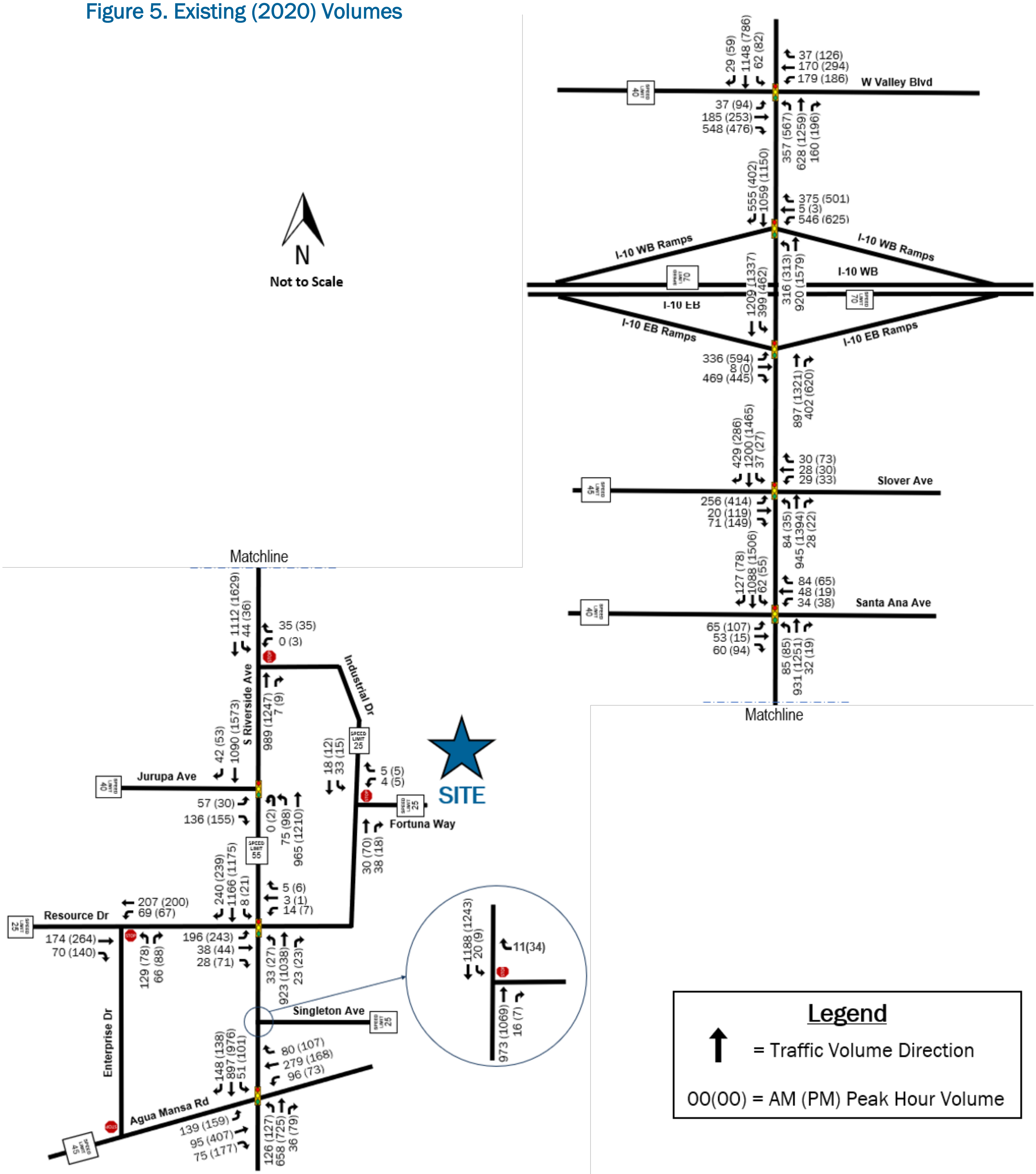


Table 4: Existing (2020) Peak Hour Intersection Operations

Int. #	Intersection	Traffic Control	AM Peak Hour		PM Peak Hour	
			Delay	LOS	Delay	LOS
1	S Riverside Ave & W Valley Blvd	Signal	43.3	D	37.6	D
2	S Riverside Ave & I-10 WB Ramps	Signal	22.5	C	20.9	C
3	S Riverside Ave & I-10 EB Ramps	Signal	26.3	C	38.2	D
4	S Riverside Ave & Slover Ave	Signal	39.3	D	77.1	E
5	S Riverside Ave & Santa Ana Ave	Signal	23.3	C	32.4	C
6	S Riverside Ave & Industrial Dr	Stop Controlled	16.0	C	20.4	C
7	S Riverside Ave & Jurupa Ave	Signal	10.5	B	17.0	B
8	S Riverside Ave & Resource Dr/Industrial Dr	Signal	26.4	C	28.9	C
9	S Riverside Ave & Singleton Dr	Stop Controlled	12.7	B	13.8	B
10	S Riverside Ave & Agua Mansa Rd	Signal	26.6	C	41.9	D
11	Industrial Dr & Fortuna Way	Stop Controlled	9.5	A	9.6	A
12	Resource Dr & Enterprise Dr	Stop Controlled	14.6	B	14.4	B

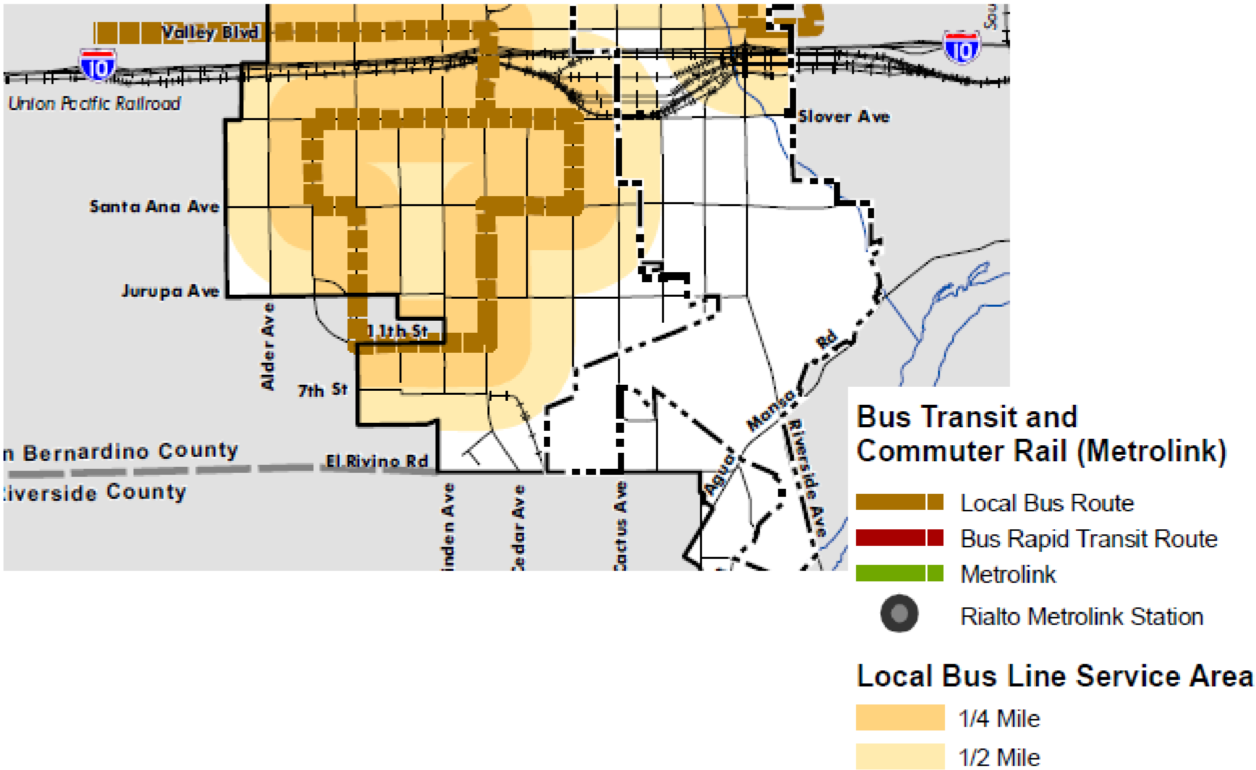
Notes: BOLD and shaded values indicate intersections operating at LOS F
At signalized intersections, delay refers to the average control delay for the entire intersection, measured in seconds/vehicle
At stop-controlled intersections, delay refers to the average vehicle delay on the worst (highest delay) movement
Delay values are based on methodology outlines in the 6th Edition Highway Capacity Manual.

Table 5: Existing (2020) Roadway Segment Operations

Roadway	Segment	Current LOS E Capacity	Existing ADT in PCE	LOS E or better?
S Riverside Ave	I-10 WB ramps to I-10 EB ramps	54,900	59,410	No
	I-10 EB ramps to Slover Ave	36,400	56,753	No
	Slover Ave to Santa Ana Ave	36,400	51,250	No
	Santa Ana Ave to Industrial Dr	36,400	65,161	No
	Resource Dr to Agua Mansa Rd	36,400	53,143	No

Notes: Daily roadway counts were collected in 2018. Counts were increased by 2%/year to bring the existing ADT to 2020.
LOS = Level of Service
ADT = Average Daily Traffic
PCE = Passenger Car Equivalent

Figure 6. Transit Service

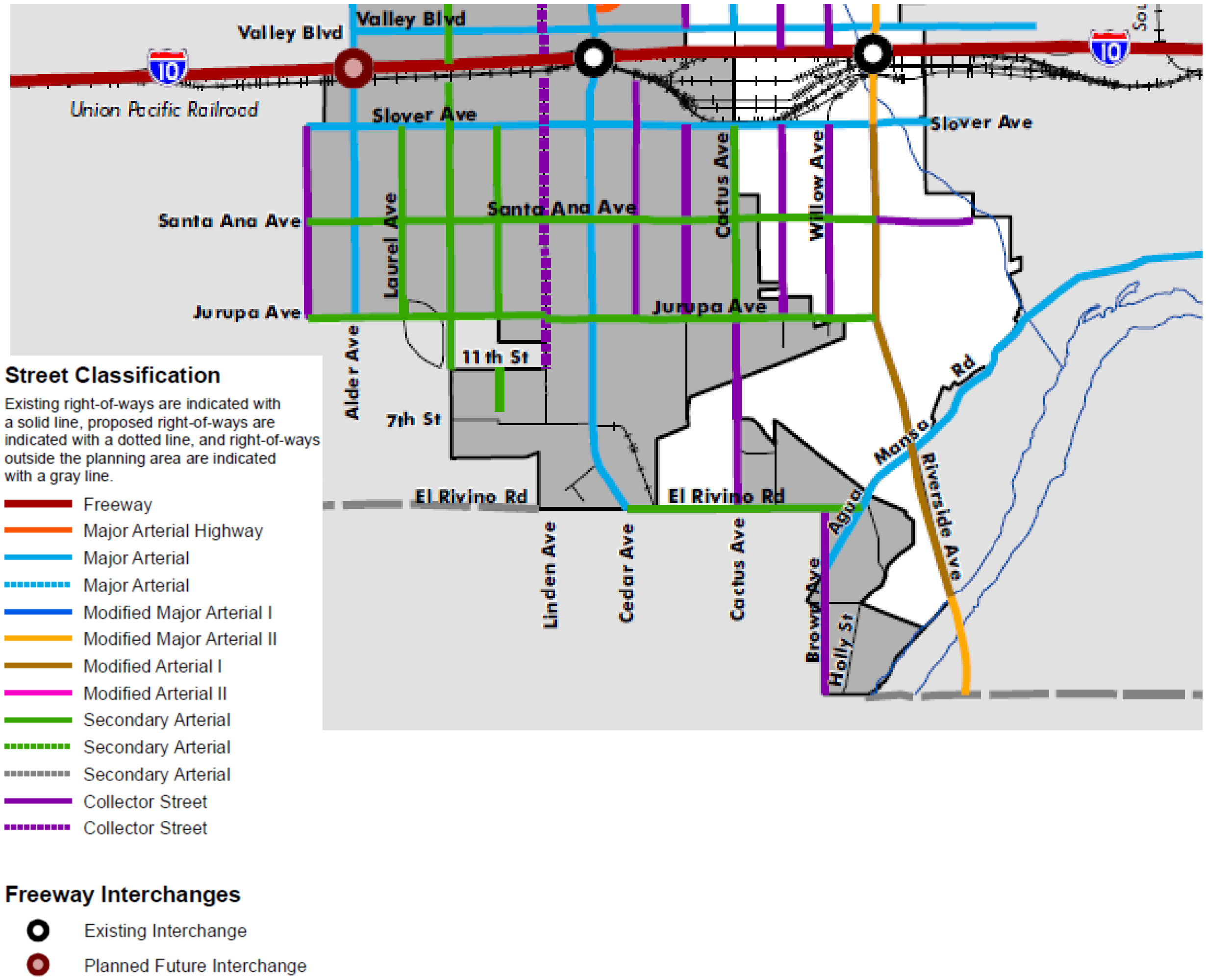


Source: City of Rialto General Plan Update (2010)

B.6. General Plan Circulation Element

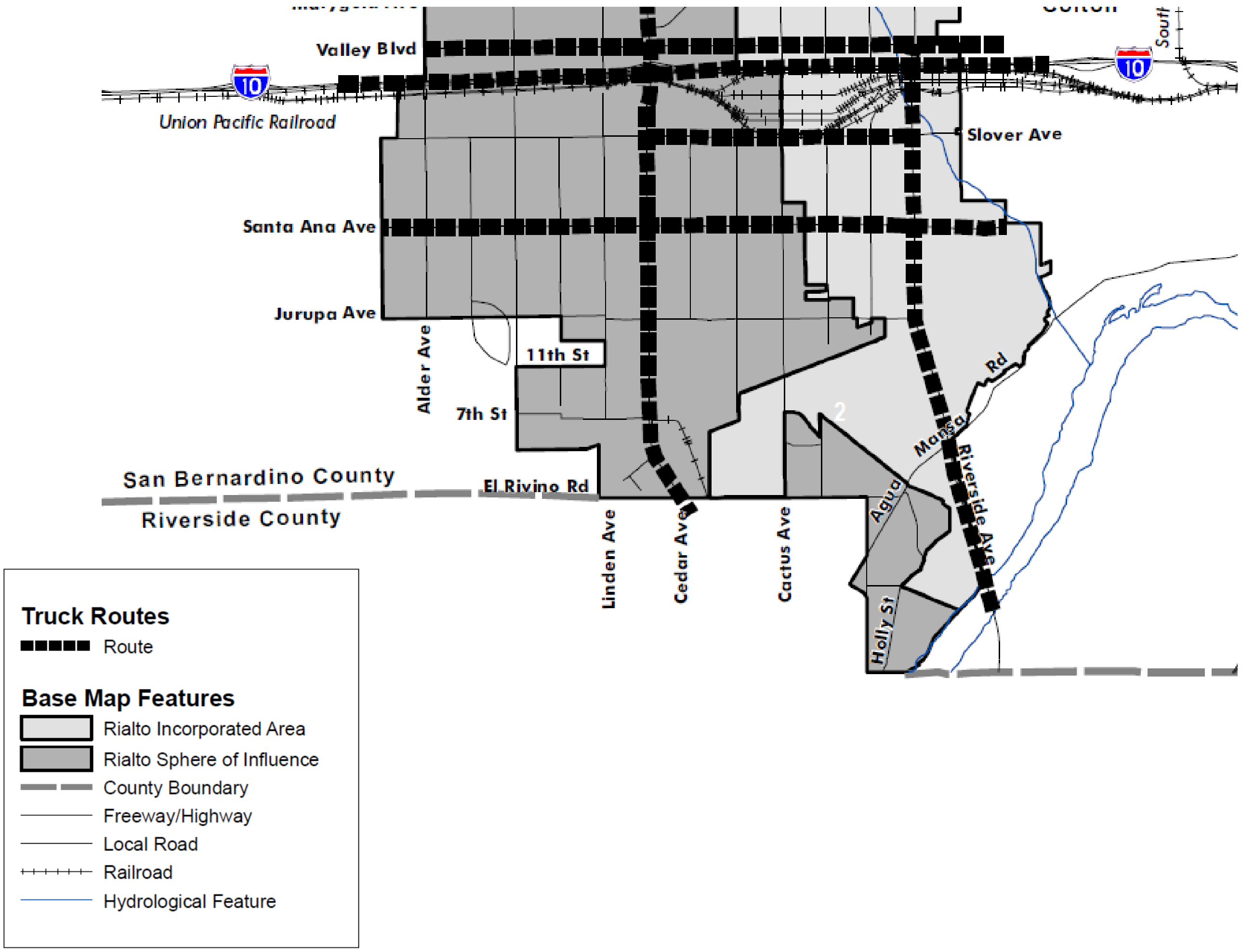
The Circulation Element refers to the General Plan for roadway designations for the project and the surrounding facility. The General Plan was approved in 2010. A copy of the Vehicular Circulation Plan is shown in Figure 7. Designated truck routes are shown in Figure 8. Project truck traffic is assumed to use the designated truck route on Riverside Avenue to access the freeway and beyond.

Figure 7. Vehicular Circulation Plan



Source: City of Rialto General Plan Update (2010)

Figure 8. Truck Routes



Source: City of Rialto General Plan Update (2010)

C. Projected Future Traffic

C.1. Project Traffic

C.1.1. Project Trip Generation

The trip generation of the site was estimated using the Institute of Transportation Engineers' (ITE) Trip Generation Manual, 10th Edition, 2017. The land use for "manufacturing" was selected as it best represents the use of the site. With this land use, the total daily trips as well as the peak hour trips are estimated. Because this site is considered a "truck intensive" land use, the project trips were converted into PCEs per the City of Rialto's *Traffic Impact Analysis Guidelines and Requirements*. Forty percent of the trips associated with this site are considered truck trips. The vehicle mix in the PCE calculation is consistent with the City of Rialto's specifications. Again, a factor of 1.5 was used for 2-axle vehicles, 2 for 3-axle vehicles, and 3.0 for 4+axle vehicles. Tables 6 and 7 summarize the project trip generation expected to and from the development per the ITE Trip Generation as well as the conversion of the trip generation into PCE values. Ultimately, the PCE values were used in analysis.

Table 6: Project Trip Generation

Land Use[1]		Quantity	Unit	Daily	AM Peak Hour			PM Peak Hour		
					In	Out	Total	In	Out	Total
Trip Generation Rates				4.006	0.475	0.142	0.617	0.206	0.465	0.671
Manufacturing		189.207[2]	KSF	758	90	27	117	39	88	127
Passenger Vehicles	60%			455	54	16	70	23	53	76
Trucks	40%			303	36	11	47	16	35	51

[1]Source: ITE Trip Generation Manual, 10th Edition
[2]Site plan dated 2/2021 shows a total area of 188,493 SF of all manufacturing components. Quantity used in trip generation remains the same (a higher value) to match scope approved by City of Rialto.

Table 7: Project Trips in Passenger Car Equivalents (PCE)

Vehicle Type	Vehicle Mix[1]	Daily Vehicles	PCE Factor	Daily	AM Peak Hour			PM Peak Hour		
					In	Out	Total	In	Out	Total
Passenger Vehicles	60%	455	1.0	455	54	16	70	23	53	76
2-Axle Trucks	0.8%	6	1.5	9	1	0	1	0	1	2
3-Axle Trucks	11.2%	85	2.0	170	20	6	26	9	20	28
4+ Axle Trucks	28.0%	212	3.0	637	76	23	98	33	74	107
Total Truck PCE Trips				**816**	**97**	**29**	**126**	**42**	**95**	**137**
Total Project PCE Trips				**1,270**	**151**	**45**	**196**	**65**	**147**	**213**

[1]Source: City of Rialto Traffic Impact Analysis Report Guidelines and Requirements, December 2013
Notes: PCE = Passenger Car Equivalent
SF = Square Feet

While the ITE Trip Generation Manual can estimate the number of daily, AM, and PM trips based on building square footage, it is still an estimate. The specific site operations indicate that there will be

75 employees per day and 250 trucks serviced per day. By doubling these trips to represent both entering and exiting trips, the total daily trip generation for the site is 650 trips. Ultimately the ITE Trip Generation was used in analysis as it is the industry standard and a more conservative estimate.

For operational analysis, the development will generate a total of 196 PCE trips (151 trips entering and 45 trips exiting) during the AM peak hour, and a total of 213 trips (65 trips entering and 147 trips exiting) during the PM peak hour.

C.1.2. Trip Distribution and Assignment

Trip distribution assumptions for both passenger vehicles and trucks were developed by taking into account the proposed site use and the routes to and from the freeway for trucks as well as the land-use in the area around the study area. Both vehicular and truck distributions were coordinated with the City of Rialto staff. Separate distribution patterns for passenger vehicles are shown in Figure 9 and trip distribution for trucks are shown in Figure 10. Trip distribution percentages at each study intersection were applied to the project trip generation to determine project trips through each intersection. The project site peak hour trips at the study intersections are shown in Figure 11.

Figure 9. Project Trip Distribution – Passenger Cars

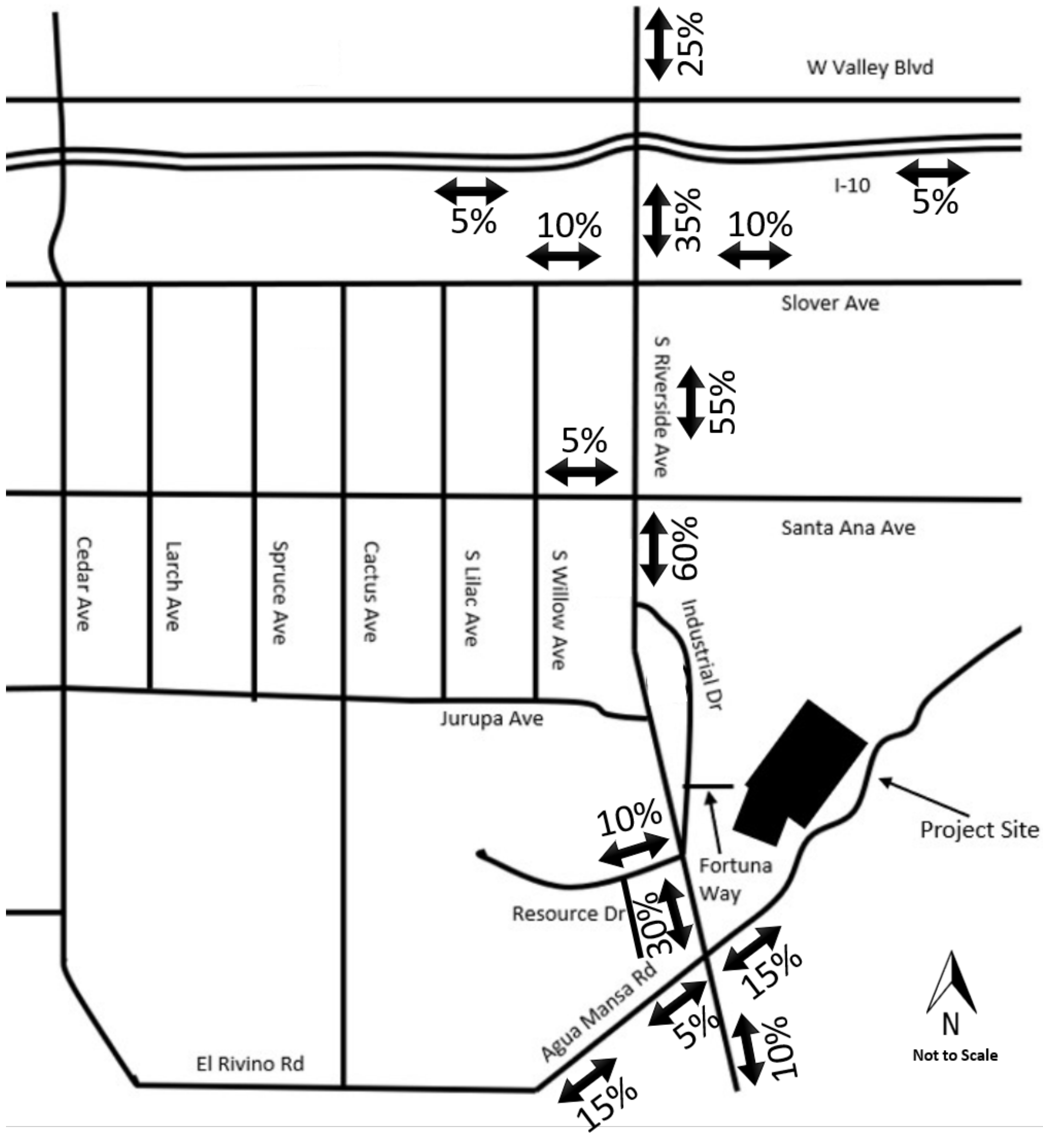


Figure 10. Project Trip Distribution – Trucks

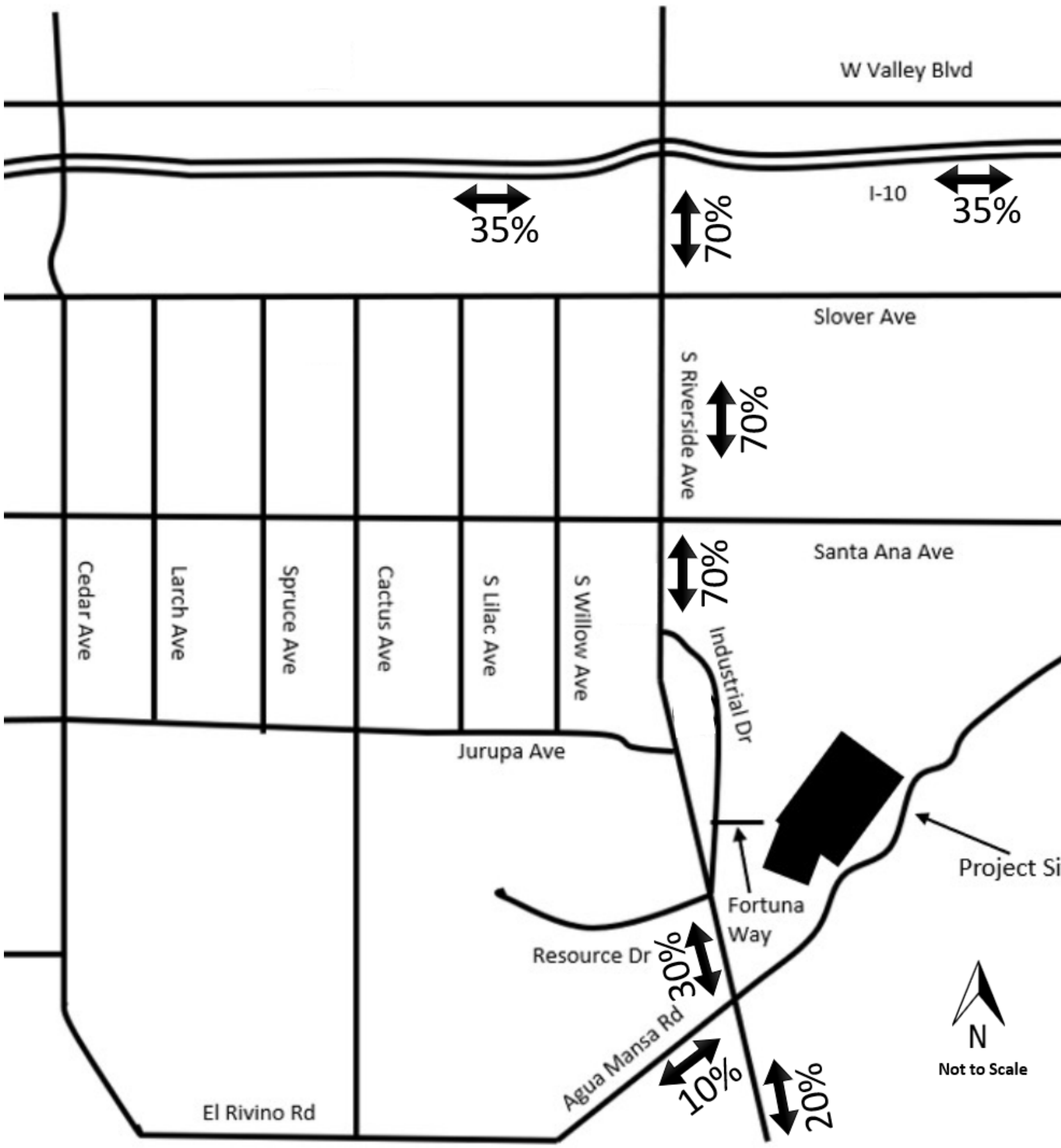
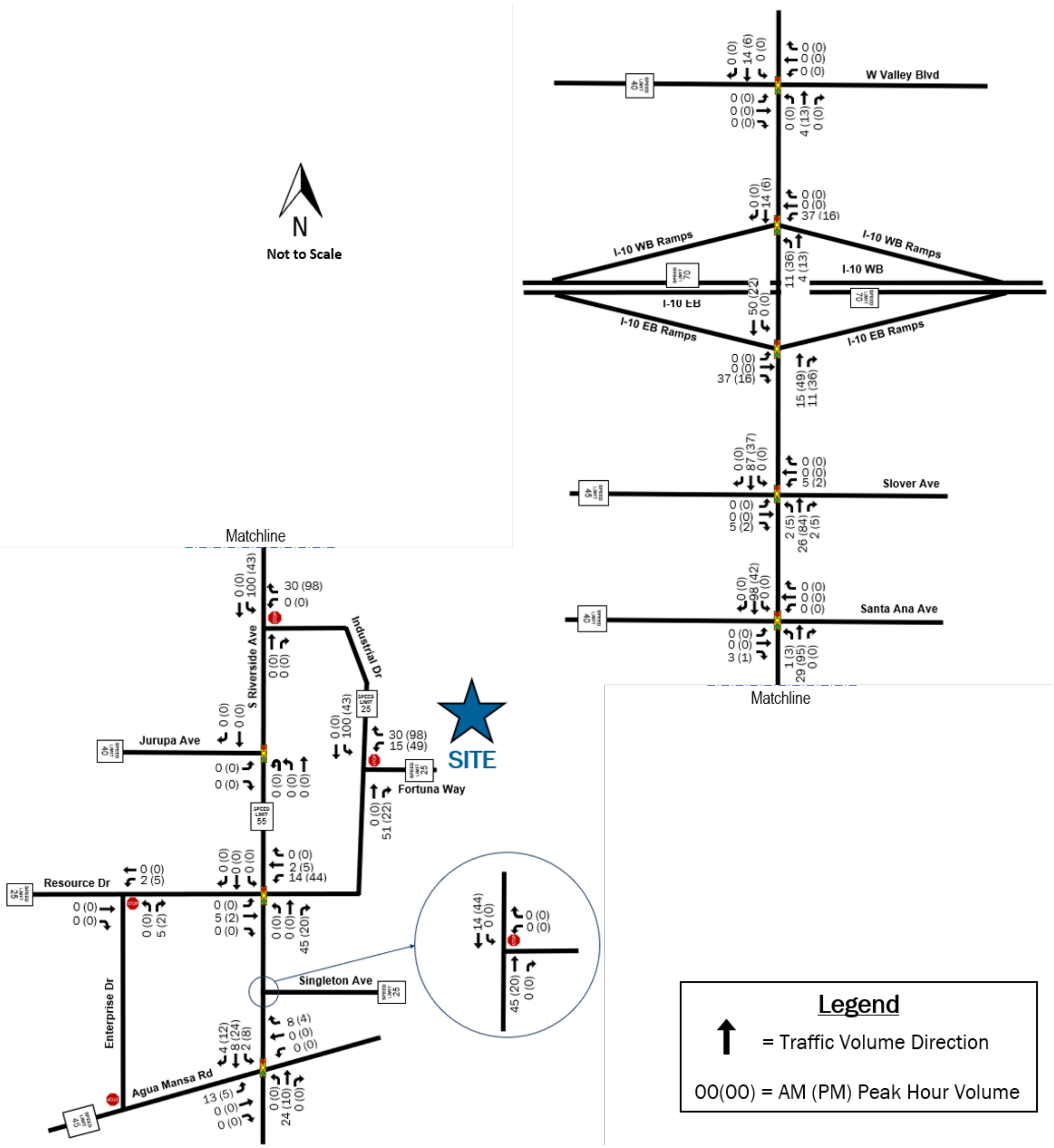


Figure 11. Project Site Trips



C.2. Opening Year 2022 - Existing Plus Growth Plus Project

This scenario portrays the existing network with the ambient growth and the project trips to predict what the operations of the transportation network will be in the opening year of 2022.

C.2.1. Ambient Growth Rate

Analysis of the historic development pattern, changes in nearby traffic volumes, and the anticipated completion of the project informed the development of a growth rate for the study area's traffic. Opening Year is anticipated to be 2022. A compound annual growth rate of 2% per year was established with coordination with the City of Rialto. This rate was applied to the existing 2020 PCE volumes for a period of two-years to account for changes in the background traffic volumes.

C.2.2. Opening Year 2022 - Existing Plus Growth

Peak hour intersection volumes for Opening Year 2022 without project traffic are shown in Figure 12. Intersection Level of Service conditions without project are shown in Table 8. All intersections would operate at LOS E or better.

Daily roadway segment operating conditions for Opening Year 2022 without project Level of Service conditions are shown in Table 9. Like the existing conditions, all roadway segments would operate over capacity with an LOS F.

C.2.3. Opening Year 2022 - Existing Plus Growth Plus Project

Peak hour intersection volumes for Opening Year 2022 with project traffic are shown in Figure 13. Intersection Level of Service conditions with project are shown in Table 8. All intersections are operating with an LOS E or better. The additional project traffic is not significant; therefore, no intersection mitigation is required at this stage.

Daily roadway segment operations for Opening Year 2022 with project Level of Service conditions are shown in Table 9. All roadway segments would operate over capacity with an LOS F; therefore, roadway segment mitigation is required.

Figure 12. Opening Year 2022 - Existing Plus Growth Volumes

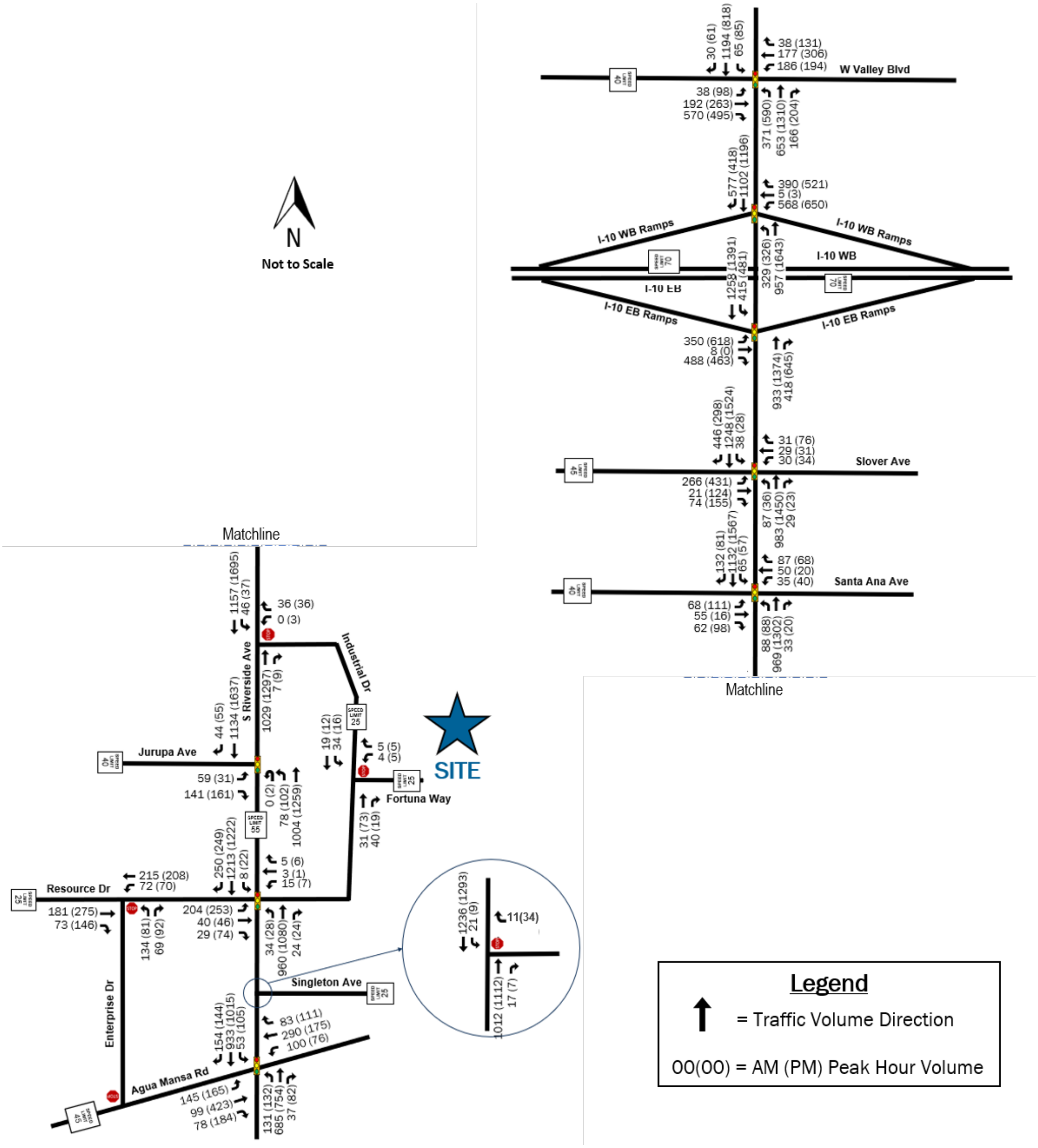


Figure 13. Opening Year 2022 - Existing Plus Growth Plus Project Volumes

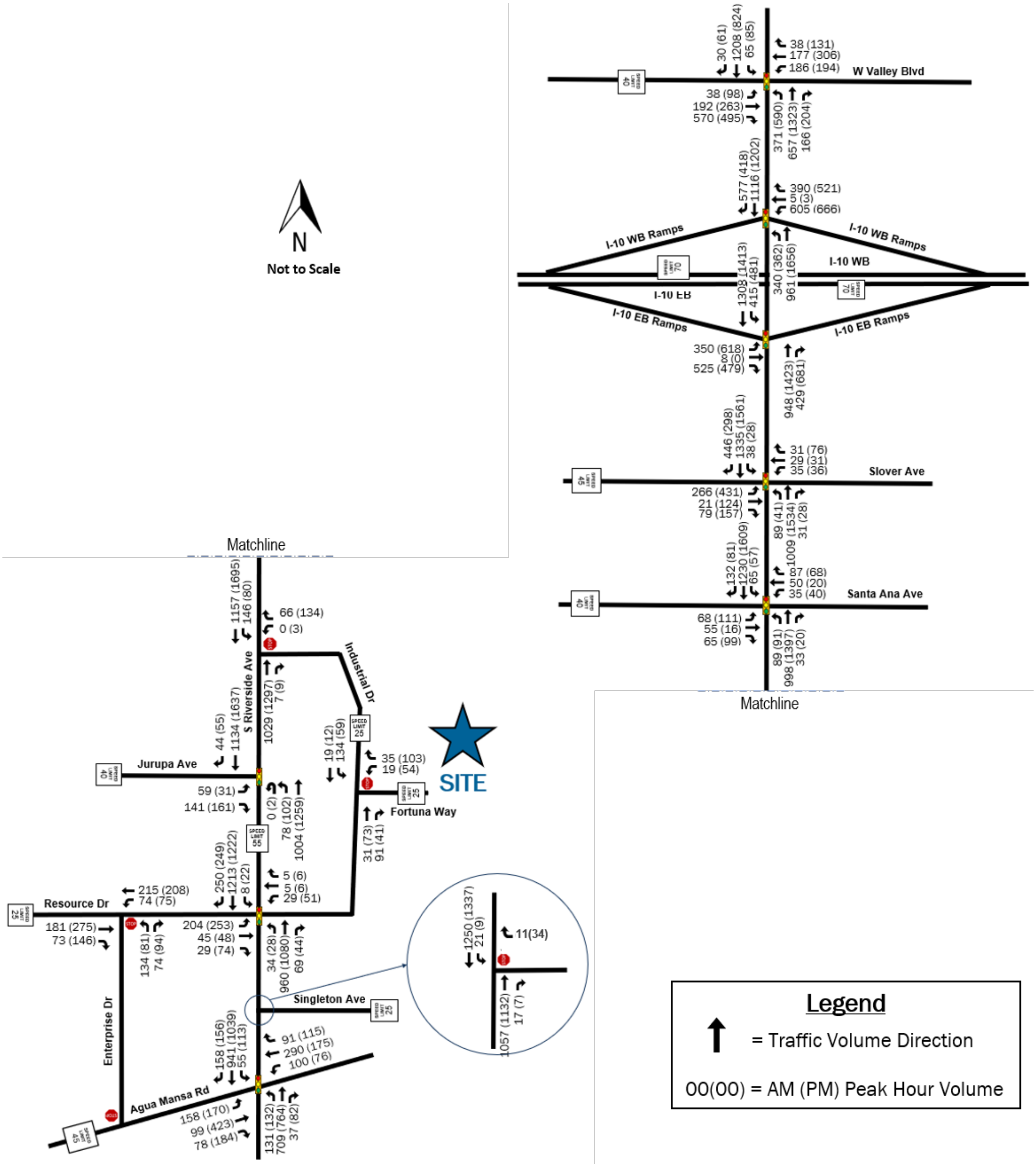


Table 8: Opening Year (2022) Intersection Operations
(Existing + Growth + Project)

	Intersection	Traffic Control	AM Peak Hour						PM Peak Hour					
			Without Project		With Project		Project Impact	Impact Sig?	Without Project		With Project		Project Impact	Impact Sig?
			Delay	LOS	Delay	LOS			Delay	LOS	Delay	LOS		
1	S Riverside Ave & W Valley Blvd	Signal	39.8	D	40.0	D	0.2	No	36.7	D	36.9	D	0.2	No
2	S Riverside Ave & I-10 WB Ramps	Signal	23.3	C	24.5	C	1.2	No	20.8	D	21.6	C	0.8	No
3	S Riverside Ave & I-10 EB Ramps	Signal	25.6	C	27.1	C	1.5	No	39.4	D	43.0	D	3.6	No
4	S Riverside Ave & Slover Ave	Signal	38.8	D	40.8	D	2	No	75.0	D	76.8	E	1.8	No
5	S Riverside Ave & Santa Ana Ave	Signal	19.8	B	22.2	C	2.4	No	24.7	C	26.5	C	1.8	No
6	S Riverside Ave & Industrial Dr	Stop	15.5	C	16.5	C	1	No	19.2	C	23.8	C	4.6	No
7	S Riverside Ave & Jurupa Ave	Signal	10.4	B	10.4	B	0	No	14.0	B	14.0	B	0	No
8	S Riverside Ave & Resource Dr/Industrial Dr	Signal	22.6	C	18.3	B	-4.3	No	18.2	B	17.6	B	-0.6	No
9	S Riverside Ave & Singleton Dr	Stop	12.3	B	12.5	B	0.2	No	13.2	B	13.4	B	0.2	No
10	S Riverside Ave & Agua Mansa Rd	Signal	28.2	C	29.2	C	1	No	34.8	C	35.1	D	0.3	No
11	Industrial Dr & Fortuna Way	Stop	9.5	A	10.7	B	1.2	No	9.5	A	11.0	B	1.5	No
12	Resource Dr & Enterprise Dr	Stop	13.9	B	14.0	B	0.1	No	13.8	B	13.9	B	0.1	No

Notes: BOLD and shaded values indicate intersections operating at LOS F
At signalized intersections, delay refers to the average control delay for the entire intersection, measured in seconds/vehicle
At stop-controlled intersections, delay refers to the average vehicle delay on the worst (highest delay) movement
Delay values are based on methodology outlines in the 6th Edition Highway Capacity Manual.

Table 9: Opening Year (2022) Roadway Segment Operations
(Existing + Growth + Project)

Roadway	Segment	LOS E Capacity	ADT in PCEs				LOS E or Better?
			Existing (2020)	Without Project	Project Traffic	With Project	
S Riverside Ave	I-10 WB ramps to I-10 EB ramps	54,900	59,410	61,810	730	62,540	No
	I-10 EB ramps to Slover Ave	36,400	56,753	59,046	730	59,776	No
	Slover Ave to Santa Ana Ave	36,400	51,250	53,321	821	54,142	No
	Santa Ana Ave to Industrial Dr	36,400	65,161	67,794	844	68,638	No
	Resource Dr to Agua Mansa Rd	36,400	53,143	55,290	381	55,671	No

Notes: LOS = Level of Service
ADT = Average Daily Traffic
PCE = Passenger Car Equivalent

C.3. Cumulative Conditions (Existing Plus Growth Plus Cumulative Projects)

This scenario portrays the existing network with the ambient growth and the cumulative project trips to predict the operations of the transportation network in the opening year of 2022 if all development under consideration at this time were fully operational.

C.3.1. Ambient Growth Rate

As discussed in section C.2.1, a compound annual growth rate of 2%, coordinated with the City of Rialto, has been applied to the existing traffic volumes for a period of two-years to account for changes in the background traffic volumes.

C.3.2. Cumulative Projects

Cumulative projects (approved and pending approval) are added to the Existing Plus Growth traffic volumes in this scenario. Cumulative projects consist of any project that has been approved and is not yet completed and projects that are in various stages of application and approval processes. The locations of the cumulative projects are shown in Figure 14. A summary of Cumulative Projects in the project vicinity and their trip generation is shown in Table 10. Cumulative project traffic volumes at the studied intersections are shown in Figure 15.

C.3.3. Cumulative Projects Trip Generation

Trip generation information for the Cumulative Projects was derived either from approved traffic studies, City of Rialto Traffic Commission Meeting minutes or ITE Trip generation rates for similar types of development. Project information and trip generation assumptions for Cumulative Projects are provided in Appendix G.

Figure 14. Location of Cumulative Projects

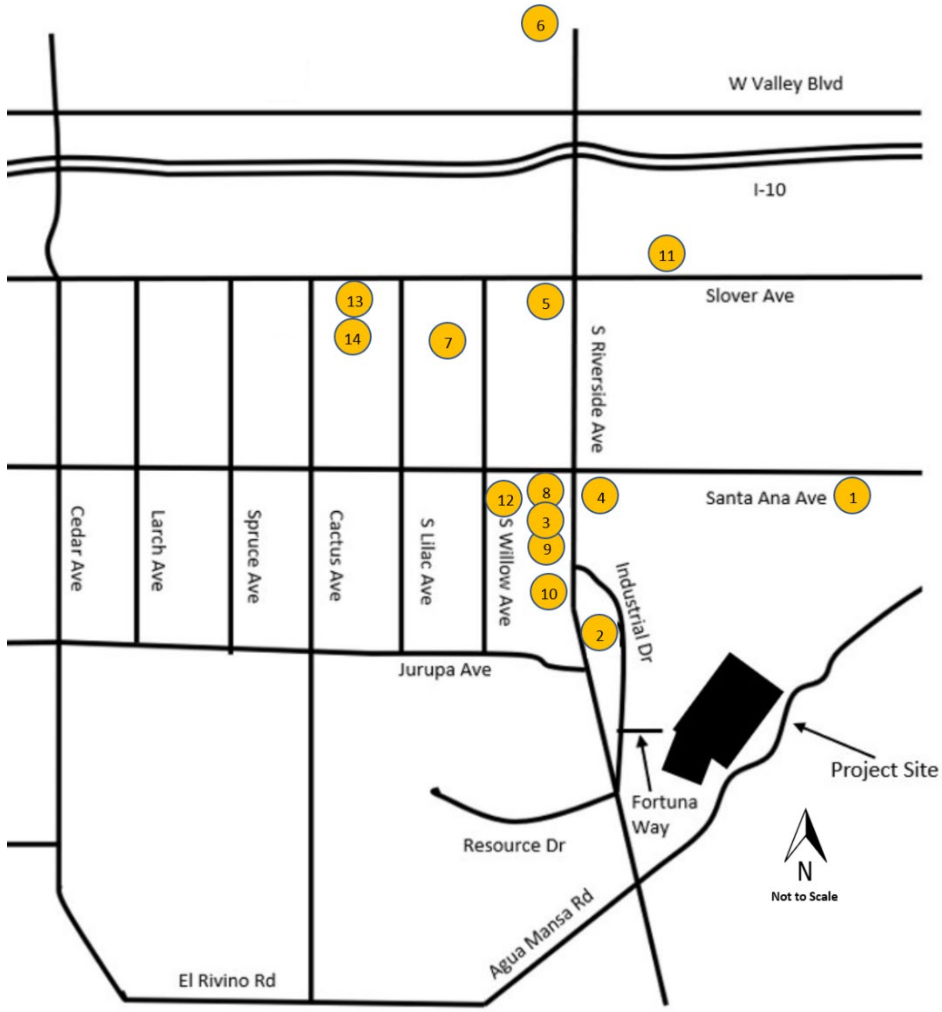


Table 10: Summary of Cumulative Projects Trip Generation

Project #	Land Use	Quantity	Units	Source	Trip Generation Estimates						
					Daily	AM Peak Hour			PM Peak Hour		
						In	Out	Total	In	Out	Total
1	South of Santa Ana Ave, East of Riverside Ave			ITE							
	Warehouse	370,000	TSF		630	54	16	70	19	53	72
	Passenger Cars		PCE		423	51	12	63	13	48	61
	Truck Trips				207	3	4	7	6	5	11
	2-axle	1.5	PCE		50	1	1	2	1	1	3
	3-axle	2.0	PCE		87	1	2	3	3	2	5
	4+ axle	3.0	PCE		391	6	8	13	11	9	21
	Net Truck Trips (PCE)				528	8	10	18	15	13	28
	Total Net Trips (PCE)				**951**	**59**	**22**	**81**	**28**	**61**	**89**
2	SEC of Riverside Ave and Industrial Dr.										
	Trucking	3.6	AC								
	Total Net Trips (PCE)				**927**	**35**	**50**	**85**	**33**	**40**	**73**
3	NWC of Riverside Ave and Industrial Dr.			TIS							
	Semi-Truck Drop/Storage Lot	3.3	Acres								
	Total Net Trips (PCE)				**850**	**32**	**46**	**78**	**30**	**37**	**67**
4	SEC of Riverside Ave and Santa Ana Ave.			TIS							
	Super Convenient Market/Gas Station/Diesel Static										
	Total Net Trips (PCE)				**3,803**	**232**	**231**	**463**	**190**	**189**	**379**
5	SWC of Riverside Ave and Slover Ave.			TIS							
	Fast Food w/Drive Thru										
	Total Net Trips (PCE)				**1,732**	**50**	**48**	**98**	**63**	**58**	**121**
6	Valley/Willow Warehouse			ITE							
	Warehouse	492.41	TSF		824	65	19	84	23	64	87
	Passenger Cars		PCE		551	60	14	74	15	57	72
	Truck Trips				273	5	5	10	8	7	15
	2-axle	1.5	PCE		66	1	1	2	2	2	4
	3-axle	2.0	PCE		115	2	2	4	3	3	6
	4+ axle	3.0	PCE		516	9	9	19	15	13	28
	Net Truck Trips (PCE)				696	13	13	26	20	18	38
	Total Net Trips (PCE)				**1,247**	**73**	**27**	**100**	**35**	**75**	**110**
7	Old Dominion Expansion			TIS							
	Parking Lot (407 Spaces)										
	Total Net Trips (PCE)				**375**	**21**	**39**	**60**	**37**	**18**	**55**
8	SC Fuels			TIS							
	Fuel Storage/Service										
	Total Net Trips (PCE)				**1,862**	**169**	**160**	**329**	**177**	**194**	**371**

Table 10: Summary of Cumulative Projects Trip Generation (Cont.)

Project #	Land Use	Quantity	Units	Source	Trip Generation Estimates						
					Daily	AM Peak Hour			PM Peak Hour		
						In	Out	Total	In	Out	Total
9	Lynn Trucking			ITE							
	Truck Parking Yard (PCE)	3.07	AC		791	30	43	73	28	34	62
	Car Wash/Repair Trips	8.827	TSF		156	5	4	9	7	7	14
	Car Wash/Repair PCE				468	15	12	27	21	21	42
	Total PCE Trips				**1,259**	**45**	**55**	**100**	**49**	**55**	**104**
10	Riverside Pallet Yard			ITE							
	Pallet Yard	3.58	AC								
	Total PCE Trips				**922**	**35**	**50**	**85**	**33**	**40**	**73**
11	Onyx Paving			TIS							
	Contractor's Yard										
	Total Net Trips (PCE)				**80**	**7**	**33**	**40**	**33**	**7**	**40**
12	Bakery Addition			ITE							
	Bakery	14,000	TSF		111	**9**	**1**	**10**	**1**	**8**	**9**
	Auto Trips				107	9	1	10	1	8	9
	Truck Trips				4	0	0	0	0	0	0
	Truck PCE Trips				8	0	0	0	0	0	0
	Total PCE Trips				**874**	**9**	**1**	**10**	**1**	**8**	**9**
13	Flyers Energy Addition			ITE							
	Warehouse	9.35	TSF		**60**	**20**	**6**	**26**	**8**	**21**	**29**
	Auto Trips				47	20	6	26	8	21	29
	Truck Trips				13	0	0	0	0	0	0
	Truck PCE Trips				39	0	0	0	0	0	0
	Total PCE Trips				**86**	**20**	**6**	**26**	**8**	**21**	**29**
14	Lilac Avenue Truck Terminal										
	Trucking	9.44	AC								
	Total PCE Trips				**2,432**	**92**	**132**	**223**	**86**	**106**	**192**

C.3.5. Cumulative Projects Trip Distribution and Assignment.

Trip distribution assumptions for the cumulative projects was derived from either approved traffic studies or developed by NV5 if the studies were not available. Trip distribution assumptions for Cumulative Projects are provided in Appendix G. Cumulative project trips are illustrated in Figure 15.

C.3.6. Opening Year 2022 - Cumulative Without Project Conditions

Peak hour intersection volumes for Opening Year 2022 with cumulative projects but without the subject project are shown in Figure 16. Intersection Level of Service conditions without the subject project are shown in Table 11. All intersections would operate at LOS E or better except S Riverside Avenue at Slover Avenue, S Riverside Avenue at Santa Ana Avenue, and S Riverside Avenue at the I-10 EB Ramps which would operate at LOS F during at least one peak hour in this scenario.

Figure 15: Cumulative Project Traffic Volumes

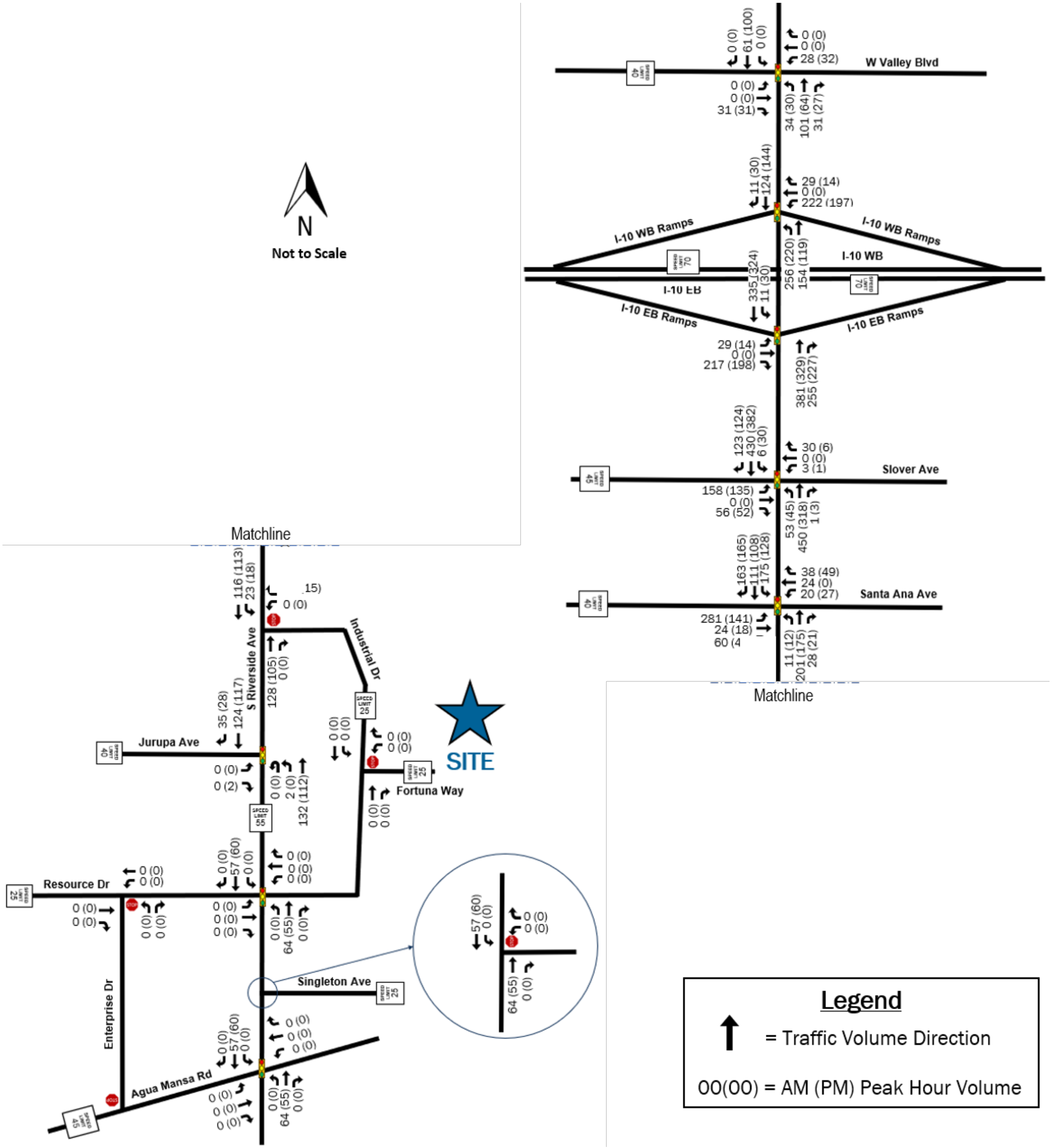
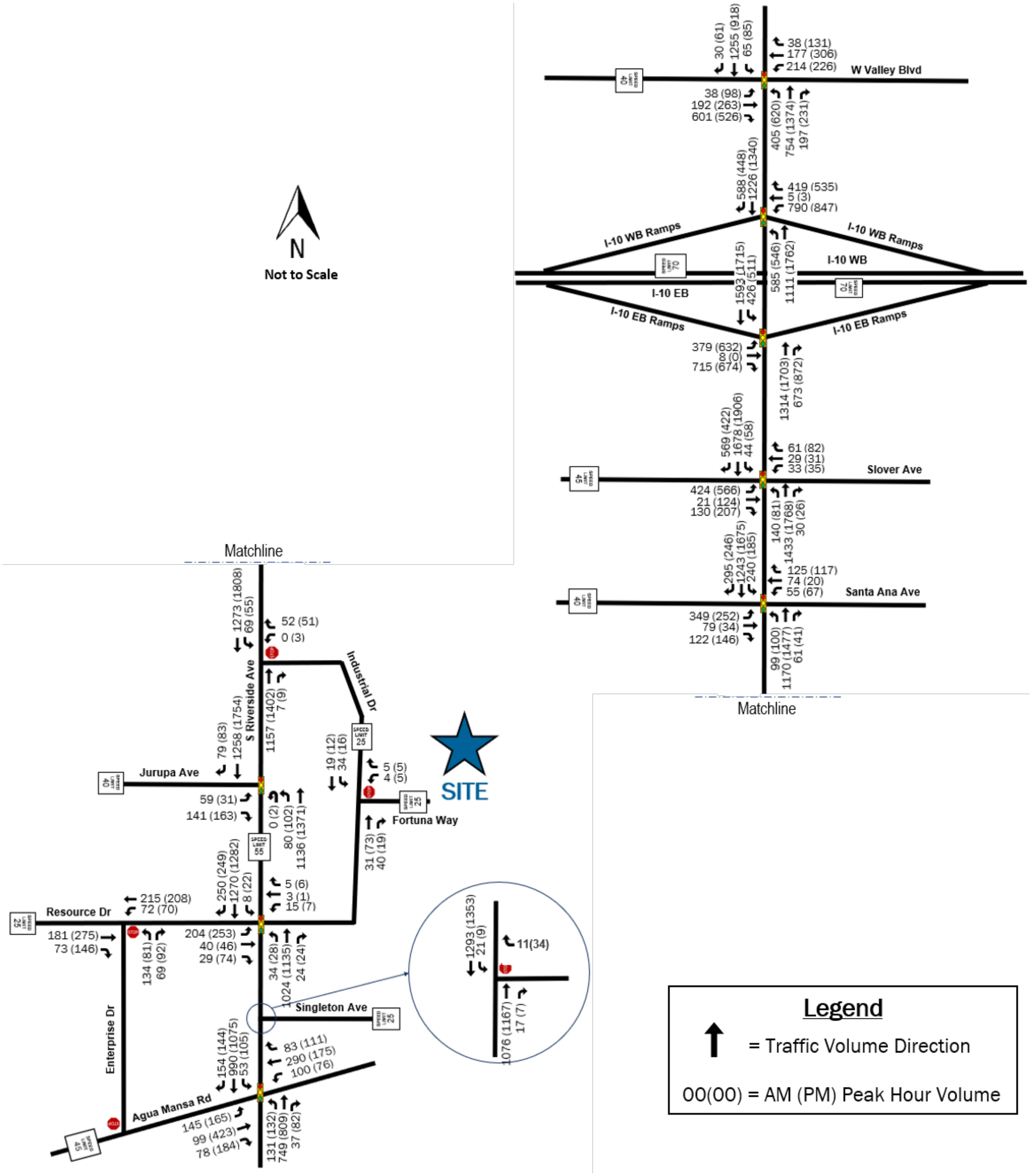


Figure 16. Opening Year 2022 Cumulative - Without Project



Daily roadway segment operations for Opening Year 2022 with cumulative projects but without the subject project Level of Service conditions are shown in Table 12. As in previous scenarios, all roadway segments operate over capacity with an LOS F and are beyond the acceptable LOS per the General Plan.

C.3.7. Opening Year 2022 Cumulative - With Project Conditions

Peak hour intersection volumes for Opening Year 2022 with cumulative projects and the subject project are shown in Figure 17. Intersection Level of Service conditions with project are shown in Table 11. All intersections would operate at LOS E or better except S Riverside Avenue at Slover Avenue, S Riverside Avenue at Santa Ana Avenue, and S Riverside Avenue at the I-10 EB Ramps, which would operate at LOS F during at least one peak hour in this scenario.

Daily roadway segment operations for Opening Year 2022 with cumulative projects and the subject project volumes Level of Service conditions are shown in Table 12. As in previous scenarios, all roadway segments operate over capacity with an LOS F and are beyond the acceptable LOS per the General Plan.

Figure 17. Opening Year 2022 Cumulative – With Project

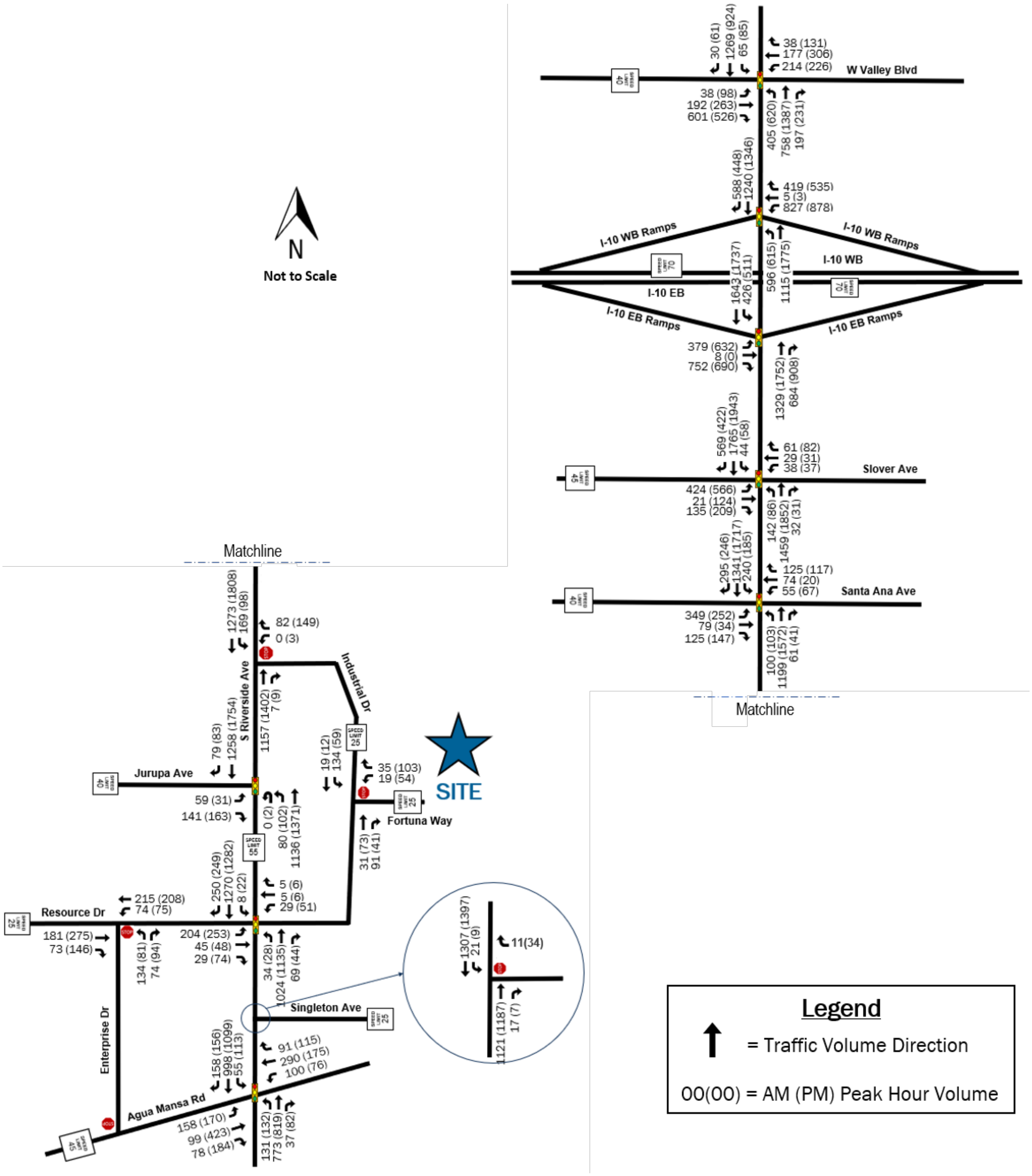


Table 11: Opening Year (2022) Intersection Operations with Subject & Cumulative Projects
(Existing + Growth + Cumulative + Project)

	Intersection	Traffic Control	AM Peak Hour						PM Peak Hour					
			Without Project		With Project		Project Impact	Impact Sig?	Without Project		With Project		Project Impact	Impact Sig?
			Delay	LOS	Delay	LOS			Delay	LOS	Delay	LOS		
1	S Riverside Ave & W Valley Blvd	Signal	44.7	D	44.9	D	0.2	No	41.9	D	41.6	D	-0.3	No
2	S Riverside Ave & I-10 WB Ramps	Signal	45.7	D	49.6	D	3.9	No	31.1	C	34.9	C	3.8	No
3	S Riverside Ave & I-10 EB Ramps	Signal	62.0	E	65.4	E	3.4	Yes	**85.4**	**F**	**93.6**	**F**	11.2	Yes
4	S Riverside Ave & Slover Ave	Signal	**147.3**	**F**	**150.4**	**F**	3.1	Yes	198.8	F	200.7	F	1.9	No
5	S Riverside Ave & Santa Ana Ave	Signal	**159.2**	**F**	**168.0**	**F**	8.8	Yes	**84.3**	**F**	**92.7**	**F**	8.4	Yes
6	S Riverside Ave & Industrial Dr	Stop	17.6	C	19.0	C	1.4	No	21.2	C	28.9	D	7.7	No
7	S Riverside Ave & Jurupa Ave	Signal	17.0	B	17.0	B	0	No	15.8	B	15.8	B	0	No
8	S Riverside Ave & Resource Dr/Industrial Dr	Signal	18.3	B	18.6	B	0.3	No	19.0	B	17.7	B	-1.3	No
9	S Riverside Ave & Singleton Dr	Stop	12.7	B	12.9	B	0.2	No	13.6	B	13.8	B	0.2	No
10	S Riverside Ave & Agua Mansa Rd	Signal	27.8	C	29.1	C	1.3	No	35.1	D	35.5	D	0.4	No
11	Industrial Dr & Fortuna Way	Stop	9.5	A	10.7	A	1.2	No	9.5	A	11.0	B	1.5	No
12	Resource Dr & Enterprise Dr	Stop	13.9	B	14.0	B	0.1	No	13.8	B	13.9	B	0.1	No

Notes: **BOLD** and shaded values indicate intersections operating at LOS F
At signalized intersections, delay refers to the average control delay for the entire intersection, measured in seconds/vehicle
At stop-controlled intersections, delay refers to the average vehicle delay on the worst (highest delay) movement
Delay values are based on methodology outlines in the 6th Edition Highway Capacity Manual.

Table 12: Opening Year (2022) Roadway Segment Operations with Subject & Cumulative Projects
(Existing + Growth + Cumulative + Project)

Roadway	Segment	LOS E Capacity	ADT in PCEs				LOS E or Better?
			Existing (2020)	Without Project	Project Traffic	With Project	
S Riverside Ave	I-10 WB ramps to I-10 EB ramps	54,900	59,410	68,771	730	69,501	No
	I-10 EB ramps to Slover Ave	36,400	56,753	71,218	730	71,948	No
	Slover Ave to Santa Ana Ave	36,400	51,250	63,420	821	64,241	No
	Santa Ana Ave to Industrial Dr	36,400	65,161	71,580	844	2,424	No
	Resource Dr to Agua Mansa Rd	36,400	53,143	58,519	381	8,900	No

Notes: Daily roadway counts were collected in 2018. Counts were increased by 2%/year to bring the existing ADT to 2022.
LOS = Level of Service
ADT = Average Daily Traffic
PCE = Passenger Car Equivalent

D. Vehicle-Miles Traveled (VMT)

As part of CEQA regulations, a VMT analysis has been conducted. San Bernardino County guidelines were utilized per direction of City of Rialto personnel. The site was screened using the San Bernardino County guidelines and was found to warrant the VMT analysis. The average VMT for the San Bernardino County area was found to be 18.98. With the project included, the VMT was calculated to be 21.18. Per San Bernardino County Guidelines, any project that causes an increase in VMT must be mitigated to reduce the VMT by 4% below the regional average. This means that the project VMT must be no more than 18.22.

The VMT analysis includes mitigation measures to reduce the site's VMT and therefore be compliant of CEQA regulations. Table 13 summarizes the proposed VMT reduction strategies for the subject project as well as the final calculated VMT with mitigations. Details regarding the analysis and all supporting documentation is provided under a separate cover.

Table 13: VMT Analysis Results

Reduction Strategy		Range of Effectiveness	VMT Reduction	Combined VMT Reduction	Results
Commute Trip Reduction (CAPCOA)					
TRT-1	Implement Commute Trip Reduction Marketing	0.8 - 6.2%	4.16%	8.8%	-1.86
TRT-3	Provide Ride Sharing Program	1-15%	5.0%	8.8%	
TRT-8	Preferential Parking Permit Program	N/A	N/A	8.8%	
Baseline 2022 Conditions w/ Project					21.18
Baseline 2022 Conditions w/ Project (CAPCOA Reduction)					19.32
Local Hiring Reduction (25%)					2.32
Baseline 2022 Conditions w/ Project (Local Hiring and CAPCOA Strategies)					17.0

E. Mitigation Measures

E.1. Intersection Improvements

Based on the City of Rialto's *Traffic Impact Analysis Report Guidelines*, the proposed project causes significant impacts at three intersections within the study area under the cumulative conditions:

- S Riverside Avenue @ I-10 EB Ramps (PM Peak Hour)
- S Riverside Avenue @ Slover Avenue (AM Peak Hour)
- S Riverside Avenue @ Santa Ana Avenue (AM & PM Peak Hour)

All intersections along S Riverside Avenue would operate at LOS E or better and all other intersections operate at LOS D or better with the project but without other cumulative projects. Under the Cumulative conditions, S Riverside Avenue's intersections at the I-10 EB Ramps, Slover Avenue, and Santa Ana Avenue would fall to LOS F.

The City of Rialto's Development Impact Fee (DIF) Nexus Study indicates improvements are funded through all significantly impacted intersections along S Riverside Avenue as part of the overall widening of Riverside Avenue between the I-10 eastbound ramps and Agua Mansa Road. Specific improvements are also funded for the intersection at Slover Avenue. There are no specific intersection improvements slated for S Riverside Avenue at I-10 Eastbound Ramps and Santa Ana Avenue. The widening and additional improvements at Slover Avenue would address the deficiencies at the intersections impacted under the cumulative conditions. Because the widening of S Riverside Avenue would increase capacity of the roadway and intrinsically improve operations at the other two significantly impacted intersections, no additional intersection improvements are identified in this report. However, with an overall roadway widening, there are intersection-specific improvements (i.e. signal modification). The cost associated with these intersection improvements is expected to be of similar scope as that which is summarized in the cost estimate for S Riverside Avenue at Slover Avenue. Because these intersections are still considered significantly impacted by the subject project, the cost estimate utilized for S Riverside Avenue at Slover Avenue was also utilized to estimate intersection-specific improvements for S Riverside Avenue at I-10 Eastbound Ramps and at Santa Ana Avenue.

E.2. Roadway Improvements

Based on the City of Rialto's *Traffic Impact Analysis Report Guidelines*, LOS threshold values for roadway segments, the following segments are currently, or will exceed their daily roadway capacities:

- S Riverside Ave: I-10 WB ramps to I-10 EB ramps
- S Riverside Ave: I-10 EB ramps to Slover Avenue
- S Riverside Ave: Slover Avenue to Santa Ana Ave
- S Riverside Ave: Santa Ana Ave to Industrial Dr
- S Riverside Ave: Resource Dr to Agua Mansa Rd

A Peak Hour Link Analysis (PHLA) was conducted for all five roadway segments since they all exceed their daily capacities. This analysis is conducted to determine if there is enough hourly capacity during the am and pm peak hours. A capacity of 1,600 PCE per lane per hour was assumed based on roadway characteristics as established by the Highway Capacity Manual (HCM) 6th Edition. The existing number of lanes was used to estimate link capacity, and the total approach volume from the Opening Year Plus Project Plus Cumulative Traffic scenario was compared to the capacity. Table 14 summarizes the findings of the PHLA for existing number of lanes and the scenario with the highest traffic volume—Opening Year Plus Project Plus Cumulative Traffic.

Table 14: Opening Year (2022) Peak Hour Link Analysis (PHLA) Summary
(Existing + Growth + Cumulative + Project)

Roadway	Segment	# of lanes	Capacity[1]	AM Peak Hour			PM Peak Hour		
				Volume[2] (North End)	Volume[2] (South End)	V/C	Volume[2] (North End)	Volume[2] (South End)	V/C
S Riverside Avenue	I-10 WB ramps to I-10 EB ramps	6	9,600	3,778	3,777	0.39	4,614	4,632	0.48
	I-10 EB ramps to Slover Ave	5	8,000	4,408	4,322	0.55	5,087	3,081	0.51
	Slover Ave to Santa Ana Ave	4	6,400	3,645	3,549	0.56	4,158	4,089	0.64
	Santa Ana Ave to Industrial Dr	4	6,400	2,881	2,681	0.43	3,647	3,457	0.56
	Resource Dr to Agua Mansa Rd	4	6,400	2,485	2,233	0.37	2,614	2,472	0.40

[1]1,600 vehicles/hr/ln is assumed
[2]Volume shown in PCEs from Opening Year Plus Project Plus Cumulative Traffic

S Riverside Ave: I-10 WB ramps to I-10 EB ramps: This segment is currently six lanes with additional turn lanes. According to the General Plan, this segment is classified as Modified Major Arterial II. According to the San Bernardino County Transportation Authority (SBCTA) Transportation Management Plan (CMP), the interchange of I-10 at Riverside Dr was recently widened. No further widening is anticipated based on the General Plan and the City of Rialto Development Impact Fee (DIF) Nexus Study. The PHLA indicates that this segment would operate below a volume-to-capacity ratio of 1.0 in Opening Year Plus Project Plus Cumulative Traffic conditions. This means that the link will function adequately at peak hours and that the intersections at either end of the roadway segment are driving the operations of the segment. Therefore, no mitigations are recommended for this segment.

S Riverside Ave: I-10 EB ramps to Agua Mansa Rd: These segments are currently five and four lanes with additional turn lanes near intersections. According to the General Plan, these segments are classified as Modified Major Arterial II. According to the San Bernardino County Transportation Authority (SBCTA) Transportation Management Plan (CMP), Riverside Avenue between the I-10 eastbound ramps and Agua Mansa Road will be widened from four and five lanes to six lanes and will be classified as an arterial with a 120’ cross section. The total cost of this widening is funded by transportation impact fees by the City of Rialto and other jurisdictions in which this roadway is in the sphere of influence. The PHLA indicates that this segment would operate below a volume-to-capacity ratio of 1.0 in Opening Year Plus Project Plus Cumulative Traffic conditions. This means that the link will function adequately at peak hours and that the intersections at either end are driving the operations of the segment. The cost estimate associated for this widening was utilized to calculate the subject projects fair-share cost.

F. Findings and Recommendations

F.1. Programed Improvements

Mitigation is proposed to widen Riverside Avenue between I-10 eastbound ramps and Agua Mansa Road in accordance with the City of Rialto's General Plan. This improvement is listed in the City of Rialto's Development Impact Fee (DIF) Nexus Study and is to be funded via transportation impact fees levied by the City of Rialto. Table 15 summarizes the analysis results for the intersections that are expected to operate at LOS F in the opening year with the project and cumulative traffic compared to the operations of these intersections with the proposed improvements per the Nexus Study. With these mitigation measures, LOS is maintained in accordance with the City of Rialto General Plan. These intersections are also those significantly impacted according to City of Rialto's *Traffic Impact Analysis Report Guidelines.*

Table 15: Opening Year (2022) Intersection Operations with Programmed Improvements
(Existing + Growth + Cumulative + Project)

Intersection		AM Peak Hour				PM Peak Hour			
		Without Improvement		With Improvement		Without Improvement		With Improvement	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
3	S Riverside Avenue at I-10 Eastbound Ramps	65.4	E	54.2	D	**93.6**	**F**	72.5	E
4	S Riverside Avenue at Slover Avenue	**150.4**	**F**	24.2	C	**200.7**	**F**	40.2	D
5	S Riverside Avenue at Santa Ana Avenue	**168.0**	**F**	47.8	D	**92.7**	**F**	28.4	C

Notes: **Bold** and shaded values indicate intersections operating at LOS F
Delay refers to the average control delay for the entire intersection, measured in seconds per vehicle
Delay values are based on methodology outlined in the 6th Edition Highway Capacity Manual

The widening of S Riverside Avenue per the General Plan adds one lane in each direction for a total of six lanes. Table 16 compares the volumes of the Opening Year Plus Projects Plus Cumulative Traffic and compares it to the updated LOS E threshold of the widened roadway. Even with the widening, LOS E is not maintained. This is remedied by PHLA discussed above.

Table 16: Opening Year (2022) Roadway Segment Operations with Programed Improvements
(Existing + Growth + Cumulative + Project)

Roadway	Segment	LOS E Capacity[1]	ADT in PCEs			LOS E or Better?
			Without Project	Project Traffic	With Project	
S Riverside Avenue	I-10 WB ramps to I-10 EB ramps	54,900	68,771	730	69,501	No
	I-10 EB ramps to Slover Ave	54,900	71,218	730	71,948	No
	Slover Ave to Santa Ana Ave	54,900	63,420	821	64,241	No
	Santa Ana Ave to Industrial Dr	54,900	71,580	844	72,424	No
	Resource Dr to Agua Mansa Rd	54,900	58,519	381	58,900	No

[1]With programed improvements
Notes: LOS = Level of Service
ADT = Average Daily Traffic
PCE = Passenger Car Equivalent

F.2. Traffic Signal Warrant Analysis

No stop-controlled intersections within the study area are shown as proposed signals in the General Plan. Nevertheless, signal warrant analyses, based on the cumulative build condition, for the four stop-controlled intersections in the study area are included in Appendix H. Apart from the intersection of S Riverside Avenue and Industrial Drive, none of these intersections meet any warrants for the consideration of a traffic signal. The Industrial Drive intersection meets the Peak Hour Warrant (#3) during the evening peak hour, but with right-turning traffic from Industrial Drive. It would also meet the Peak Hour Warrant with the southbound left turning traffic considered the minor movement and the northbound traffic considered the major movement during the morning peak hour. The same is true for Warrants 1 (Eight-Hour Vehicular Volume) and 2 (Four-Hour Vehicular Volume) during the peak hours. Condition A (Minimum Vehicular Volumes) of Warrant 1 would be met during both hours for which data is available as would Warrant 2. However, delays for both the traffic exiting and turning left onto Industrial Drive do not exceed and average of 29 seconds/vehicle and the volume to capacity ratio would be less than 0.51 during peak hours under the cumulative build conditions, well within acceptable ranges. Approval of a traffic signal at this location is not anticipated due in part to the small amount of traffic turning left from Industrial Drive and the option for that traffic to access S. Riverside Avenue via the existing signalized intersection at Resource Drive (intersection 8).

F.3. Site Circulation

Vehicular access to the project site will be via two driveways in the col-de-sac of Fortuna Way.

- Driveway 1 will be enter-only and provide access to the entire site. All vehicles will enter via Driveway 1.
- Driveway 2 will be exit-only.
- Driveways 1 and 2 will be 26' wide.

The two driveways are located at the end of a cul-de-sac and act as an extension of Fortuna Way. The cumulative with project intersection analysis indicates that both driveways will operate at an acceptable Level of Service during both peak hour periods.

Circulation within the site is in one direction. This reduces conflict points between vehicles reducing the probability of collisions within the site as well as their severity.

The driveway to Singleton Drive is proposed for construction traffic only and would rarely be used once the site is in operation.

F.4. Safety and Operational Improvements

The site driveways and project improvements must be designed so that adequate sight distance for drivers entering and exiting is maintained. Because these driveways are at the end of the cul-de-sac on Fortuna way, they act as an extension of the roadway recuing the need for sight distance as there are no conflicting movements.

Nevertheless, adequate sight distance must be maintained at both driveways. The line of sight, a straight line between the driver's eye and oncoming vehicles on the adjacent roadway, defines the Limited Use Area. The Limited Use Area for each driveway must be kept clear of visual obstructions, including project signs, building structures, and landscaping, in order to maintain adequate sight distance.

The proposed driveways of the site were also verified to provide sufficient space for ingress and egress of design vehicles. The driveways at the end of Fortuna Way were assessed with a WB-67 design vehicle. The driveway at the end of Singleton Drive is exclusive to construction vehicles. As a result, a dump truck was used as a design vehicle. Appendix I includes the truck turning templates for all proposed driveways of the site.

F.5. Fair Share Calculations

The mitigations proposed by this report coincide with the City of Rialto General Plan. The City's Development Impact Fee (DIF) document includes the widening of Riverside Drive between I-10 eastbound ramps and Agua Mansa Road. According to the DIF from 2016 the total cost of the widening of S Riverside Avenue is $40,429,920. The bridge widening associated with this project already has funding at $15,000,000 allocated for it. The remaining balance of $25,429,920 was utilized for fair share calculations. The length of the widening project was measured to be 18724 feet. A unit cost per one hundred (100) feet of widening was calculated using the net cost of the project compared to the length of the project to be $198,919.90 per one hundred feet of widening. The cost estimate for S Riverside Avenue is included in Appendix J.

Intersection specific improvements to S Riverside Avenue at Slover Avenue are also included in the DIF Nexus Study with a separate cost of $355,200. This cost estimate is also included in Appendix J. While there are no specific cost estimates associated with the other two significantly impacted intersections, the cost estimate for S Riverside at Slover Avenue was utilized to calculate the fair share cost associated with the other two significantly impacted intersections.

Tables 17 and 18 calculate the fair share of each significantly impacted intersection and roadway segment. The percentage is then used to calculate the fair share cost associated with the burden of adding the project trips to that specific intersection or segment. Table 19 summarizes this cost per impacted intersection/segment as well as the total cost owed by the developer to the City of Rialto in traffic impact fees. Based on this calculation, the City of Rialto is owed $724,397.81 in fair share costs as part of the permitting process for the subject project.

Table 17: Fair Share of Mitigation Measures – Intersections

Intersection		AM Peak					PM Peak				
		Total Volume		Total Growth	Project		Total Volume		Total Growth	Project	
		E	E+G+C+P		Trips	%age	E	E+G+C+P		Trips	%age
3	S Riverside Ave. at I-10 EB Ramps	3,720	5,221	1,501	96	6.4%	4,779	6,230	1,451	123	8.5%
4	S Riverside Ave. at Slover Ave.	3,157	4,719	1,562	95	6.1%	4,047	5,441	1,394	135	9.7%
5	S Riverside Ave. at Santa Ana Ave.	2,669	4,043	1,374	95	6.9%	3,332	4,501	1,169	141	12.1%

Table 18: Fair Share of Mitigation Measures – Segments (S Riverside Avenue)

Segment	Total Daily Volume		Total Daily Growth	Daily Project Trips	Project Percentage
	E	E+G+C+P			
I-10 EB ramps to Slover Ave	49,897	69,501	19,604	730	3.7%
Slover Ave to Santa Ana Ave	42,626	71,948	29,322	821	2.8%
Santa Ana Ave to Industrial Dr	36,839	64,241	27,402	844	3.1%
Industrial Dr to Agua Mansa Rd	47,673	72,424	24,751	427	1.7%

F.6. Specific Plan Signalization

Not Applicable.

F.7. General Plan Conformance

The proposed manufacturing facility is in conformance with the Agua Mansa Specific Plan and the City of Rialto General Plan. The proposed manufacturing facility use is permitted under the Employment and Employment Overlay land use designations. Neither a Specific Plan Amendment nor a General Plan Amendment is required for this project.

Table 19: Mitigation Fair Share Cost

Intersection/Segment	Unit Cost	Quantity[1]	Total
S Riverside Avenue at I-10 EB Ramps	$ 355,200.00	1	$ 355,200.00
Project Fair Share Percentage (E vs E+G+C+P)[2]			8.5%
Project Cost			$ 30,109.99
S Riverside Avenue at Slover Avenue	$ 355,200.00	1	$ 355,200.00
Project Fair Share Percentage (E vs E+G+C+P)[2]			9.7%
Project Cost			$ 34,398.85
S Riverside Avenue at Santa Ana Ave.	$ 355,200.00	1	$ 355,200.00
Project Fair Share Percentage (E vs E+G+C+P)[2]			12.1%
Project Cost			$ 42,842.77
I-10 EB ramps to Slover Ave	$ 198,919.90	18.97	$ 3,773,510.50
Project Fair Share Percentage (E vs E+G+C+P)			3.7%
Project Cost			$ 140,515.34
Slover Ave to Santa Ana Ave	$ 198,919.90	26.57	$ 5,285,301.74
Project Fair Share Percentage (E vs E+G+C+P)			2.8%
Project Cost			$ 147,985.56
Santa Ana Ave to Industrial Dr	$ 198,919.90	17.11	$ 3,403,519.49
Project Fair Share Percentage (E vs E+G+C+P)			3.1%
Project Cost			$ 104,830.69
Industrial Dr to Agua Mansa Rd	$ 198,919.90	65.19	$ 12,967,588.27
Project Fair Share Percentage (E vs E+G+C+P)			1.7%
Project Cost			$ 223,714.61
Total Project Cost			**$ 724,397.81**

[1]1 for intersections and measured in 100s of feet for roadway segments

[2]Higher of AM or PM project fair share percentage

Appendices

Appendix A – Scoping Document

Appendix B – Vicinity Map

Appendix C – Site Plan

Appendix D – Historic Traffic Counts (in lieu of new existing counts)

Appendix E – PCE Calculations

Appendix F – Synchro Analysis Outputs

Appendix G – Cumulative Project Calculations

Appendix H – Signal Warrant Analyses

Appendix I – Truck Turning Template

Appendix J – Cost Estimates

Appendix A – Scoping Document

MEMORANDUM

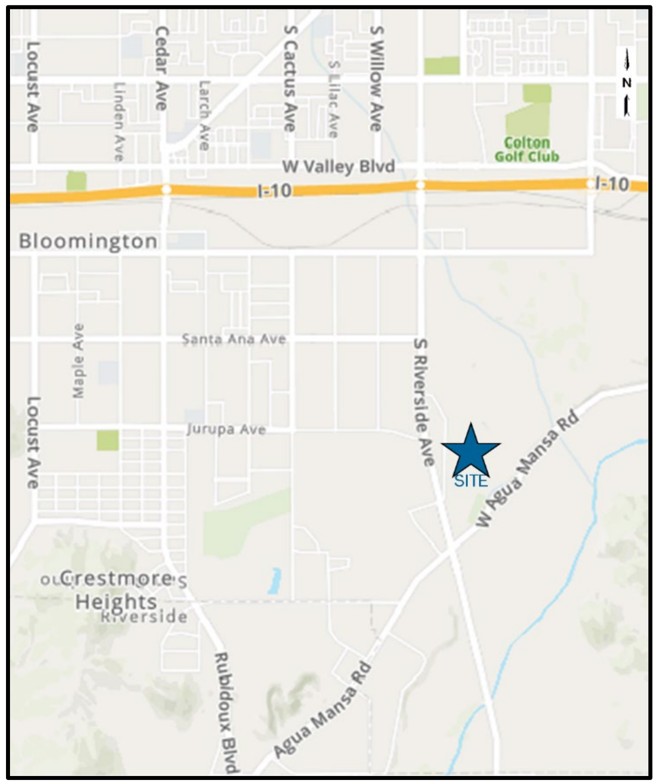
To: Daniel Casey, City of Rialto, California (dcasey@rialtoca.gov)

From: Victoria Guobaitis, PE, PTOE, NV5 Traffic Consultant (victoria.guobaitis@NV5.com)

CC: John Quigley, PE, Angelus Block Co., Inc. (JQuigley@angelusblock.com)

Date: April 19, 2021

Re: MC 2020-0012
Angelus Block Co. Inc
0 Fontana Way
Rialto, CA 92316
Traffic Scoping Memo



This memorandum reviews the scope of a proposed manufacturing building to be developed on parcels with APN 0260-061-67, APN 0260-061-41, and APN 0260-061-42. This memo serves as the initiating scoping memorandum between the City of Rialto and NV5 as the traffic engineering consultant on behalf Angelus Block Co, Inc.

EXISTING SITE INFORMATION

The proposed site is made up of three parcels and is located east of S Riverside Avenue and north of Agua Mansa Road in the southern part of Rialto. The site is located approximately 1.5 miles south of Interstate 10 (I-10). The proposed site is located on the 8th subset within the Agua Mansa Specific Plan which is consisted of primarily general industry land-use with minimal residential.

PROPOSED SITE INFORMATION

The project will involve the construction of a manufacturing plant building with 135,581 square feet, an office building with 10,018 square feet, a storage warehouse with 14,160 square feet, a mechanical shop with 7,200 square feet, and a metal canopy with 21,534 square feet.

Access to the site is provided via a cul-de-sac at the end of Fontana Way. There are two one-way driveways spaced out within this cul-de-sac: one for entering and one for exiting. A secondary entrance is via Singleton Dr at the southern portion of the proposed site. This entrance is dedicated to construction vehicles and will not be used for daily operations once construction of the site is complete.

SCOPING MEMO

See the attached Scoping Memo as provided by the City of Rialto's *Traffic Impact Analysis Report Guidelines and Requirements* (December 2013). It includes key expectations that will be included in the forth coming Traffic Impact Study (TIS).

Exhibit B

SCOPING AGREEMENT FOR TRAFFIC IMPACT ANALYSIS

This following form shall be used to acknowledge preliminary approval of the scope for the traffic impact analysis (TIA) of the following project. The TIA must follow the City of Rialto Traffic Impact Analysis – Report Guidelines and Requirements, adopted by the City Council on 2014.

City of Rialto

Traffic Impact Analysis

Scoping Agreement

Case No. MC 2020-0012

Related Cases -

SP No. ______

EIR No. ______

GPA No. ______

ZC No. ______

Project Name: Angelus Block Co., Inc. - Attachment 1 - Site Plan

Project Address: 0 Fortuna Way (no address at this time), Rialto CA 92316

Project Description: Construct Concrete Block Manufacturing Facility and Ancillary Site on Two Vacant Parcels

	Consultant	Developer
Name:	NV5	Angelus Block Co., Inc.
Address:	3777 Long Beach Blvd, Annex Bldg	11374 Tuxford Street
Telephone:	Long Beach, CA 90807	Sun Valley, CA 91352
Fax:	(800) 608-3010	(818) 767-8576
	n/a	n/a

1. Trip Generation Source: ITE Trip Generation Manual, most recent 10th Edition (2017)

Existing GP Land Use Vacant Proposed Land Use Manufacturing (140)

Current Zoning: Agua Mansa Specific Plan Proposed Zoning: No Change

Total Daily Project Trips: 1,270 (with PCE) - Attachment 2 - Trip Generation Table

	Current Trip Generation			Proposed Trip Generation (w/ PCE)		
	In	Out	Total	In	Out	Total
AM Trips	n/a	n/a	n/a	151	45	196
PM Trips	n/a	n/a	n/a	65	147	213

Internal Trip Allowance Yes No X (0 % Trip Discount)

Pass-By Trip Allowance Yes No X (0 % Trip Discount)

For appropriate land uses, a pass-by trip discount may be allowed not to exceed 25%. Discount trips shall be indicated on a report figure for intersections and access locations.

Attachment 4 & 5 - Passenger Car and Truck Distribution

2. Trip Geographic Distribution: N % S % E % W %

(Detailed exhibits of trip distribution must be attached with Trucks as a separate exhibit)

3. Background Growth Traffic

Project Completion Year: 2022 Annual Background Growth Rate: 2 %

Other Phase Years n/a

Other area projects to be considered: Attachment 6 & 7 - Cumulative projects map and list.

(Contact Planning for Lists. Correlate projects to exhibit map and also indicate which projects have been included in study area forecasts for existing + background growth + project + cumulative)

Model/Forecast methodology: Existing + Growth + Project, Cumulative Projects to Opening Year

4. Study Intersections: (NOTE: Subject to revision after other projects, trip generation and distribution are determined, or comments from other agencies received.)

Attachment 3 - Study Area

1. S. Riverside Ave at I-10 WB ramps
2. S. Riverside Ave at I-10 EB ramps
3. S. Riverside Ave at Slover Ave
4. S. Riverside Ave at Santa Ana Ave
5. S. Riverside Ave at Industrial Dr
6. S. Riverside Ave at Resource Dr/Industrial Dr
7. S. Riverside Ave at Agua Mansa Rd
8. Industrial Dr at Fortuna Way
9. S. Riverside Dr at W. Valley Blvd
10. S. Riverside Dr at Singleton Dr
11. S. Riverside Dr at Jurupa Ave
12. Resource Dr at Enterprise Dr

5. Study Roadway Segments: (NOTE: Subject to revision after other projects, trip generation and distribution are determined, or comments from other agencies received.)

1. S. Riverside Ave - Industrial Dr to Santa Ana Ave
2. S. Riverside Ave - Agua Mansa Rd to Resource Dr
3. S. Riverside Ave - Santa Ave to Slover Ave
4. S. Riverside Ave - Slover Ave to I-10 EB ramps
5. S. Riverside Ave - I-10 EB ramps to I-10 WB ramps
6. __________
7. __________
8. __________
9. __________
10. __________

6. Other Jurisdictional Impacts

Is this project within any other Agency's Sphere of Influence or within one-mile of another jurisdictional boundary? X YES ______ NO

If so, name of Jurisdiction: City of Colton, City of Jurupa Valley and County of San Bernardino

7. Site Plan (please attach 11" x 17" legible copy) - see Attachment 1 - Site Plan

8. Specific issues to be addressed in the Study (in addition to the standard analysis described in the Guideline) (to be filled out by the City of Rialto Public Works Department) (NOTE: If the traffic study states that "a traffic signal is warranted" (or "a traffic signal appears to be warranted," or similar statement) at an existing un-signalized intersection under existing conditions, 8-hour approach traffic volume information must be submitted in addition to the peak hourly turning movement counts for that intersection.)

Fair-Share Analysis Table with industry standard cost estimate for each improvement

Peak Hour Signal Warrant Analysis for unsignalized study intersections

Site circulation discussion, including truck turning radii at site driveways with exhibit in report

VMT analysis

9. Existing Conditions

Traffic count data must be new or within one year. Provide traffic count dates if using other than new counts.

Date of counts: Due to pandemic, historical counts will be obtained and an annual growth rate applied to develop year "2020" counts. Methodology to be included in report.

NOTE Fees are due and must be submitted with, or prior to submittal of this form. The City will not process the Scoping Agreement prior to the receipt of the processing fee.

Fees Paid: ________________ Date ________________

Recommended:

Scoping Agreement Submittal date 01/20/2021

Scoping Agreement Resubmittal date 03/31/2021

NV5 Victor Carbuitis 03/31/2021

Applicant/Engineer Date

Land Use Concurrence:

Development Services Department Date

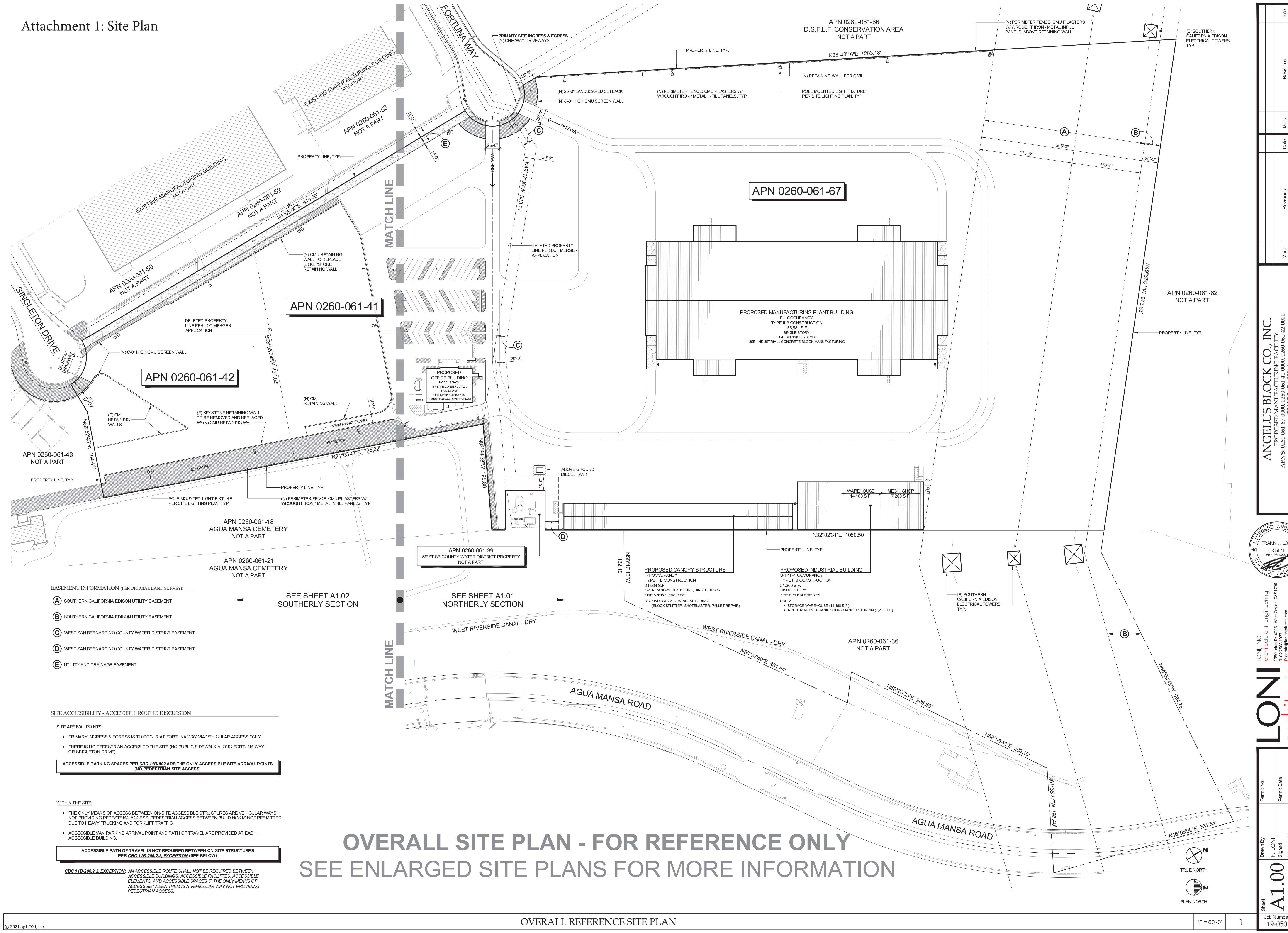
Approved by:

Public Works Department Date

NOTE:

The Applicant/Engineer acknowledges that the Scoping Agreement is intended to assist in the preparation of any required TIA. It is preliminary in nature and the City does not have sufficient data to determine the ultimate conditions that may be imposed for the project. It does not provide nor limit the requirements imposed on the Project but is intended only to provide initial input into the parameters for review of the traffic generated by the Project and the initial areas to be considered and studied. Subsequent changes to scope of required analysis to be included in the TIA may be required by the Transportation Commission, Planning Commission, and/or the City Council upon Public Works Director/City Engineer review and approval.

Attachment 1: Site Plan



Attachment 2
Angelus Block Co., Inc.

Summary of Project Trip Generation
Angelus Block Co., Inc.

Land Use[1]		Quantity	Units	Daily	AM Peak Hour			PM Peak Hour		
					In	Out	Total	In	Out	Total
Manufacturing (LUC 140)		189,207	SF	758	90	27	117	39	88	127
Passenger Vehicles	60%			455	54	16	70	23	53	76
Trucks	40%			303	36	11	47	16	35	51
Vehicle Type	**Vehicle Mix[2]**	**Daily Vehicles**	**PCE Factor**	**Daily PCE Vehicles**	**AM Peak Hour**			**PM Peak Hour**		
					In	**Out**	**Total**	**In**	**Out**	**Total**
Passenger Vehicles	60.0%	455	1.0	455	54	16	70	23	53	76
2-Axle Trucks	0.8%	6	1.5	9	1	0	1	0	1	2
3-Axle Trucks	11.2%	85	2.0	170	20	6	26	9	20	28
4+ Axle Trucks	28.0%	212	3.0	637	76	23	98	33	74	107
Total Truck PCE Trips				**816**	**97**	**29**	**126**	**42**	**95**	**137**
Total Project PCE Trips				**1,270**	**151**	**45**	**196**	**65**	**147**	**213**

1 - Source: ITE Trip Geneneration Manual, 10th Edition

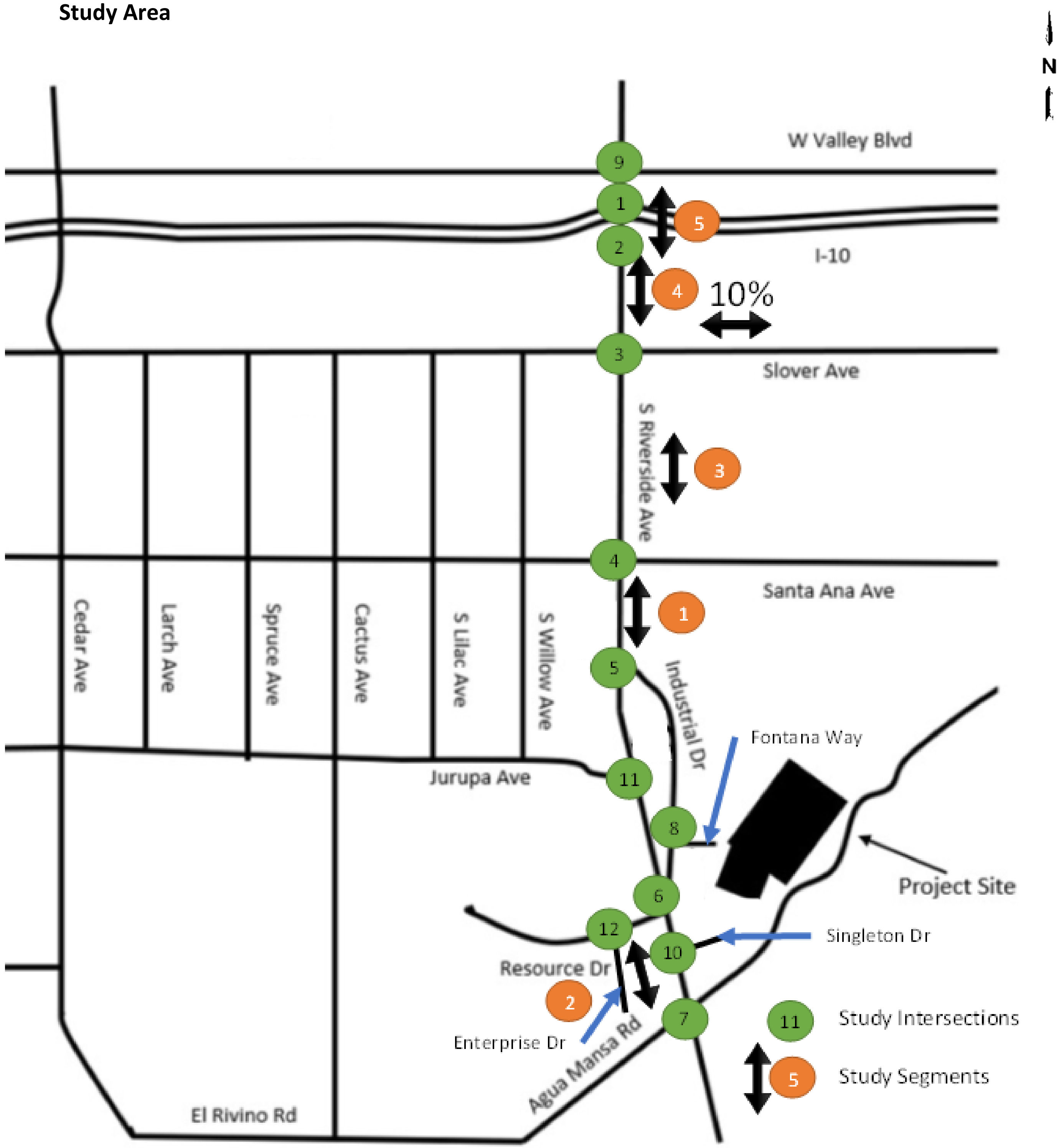
2 - Source: City of Rialto Traffic Impact Analysis Report Guidelines and Requirements, December 2013

PCE = Passenger Car Equivalent

SF = Square Feet

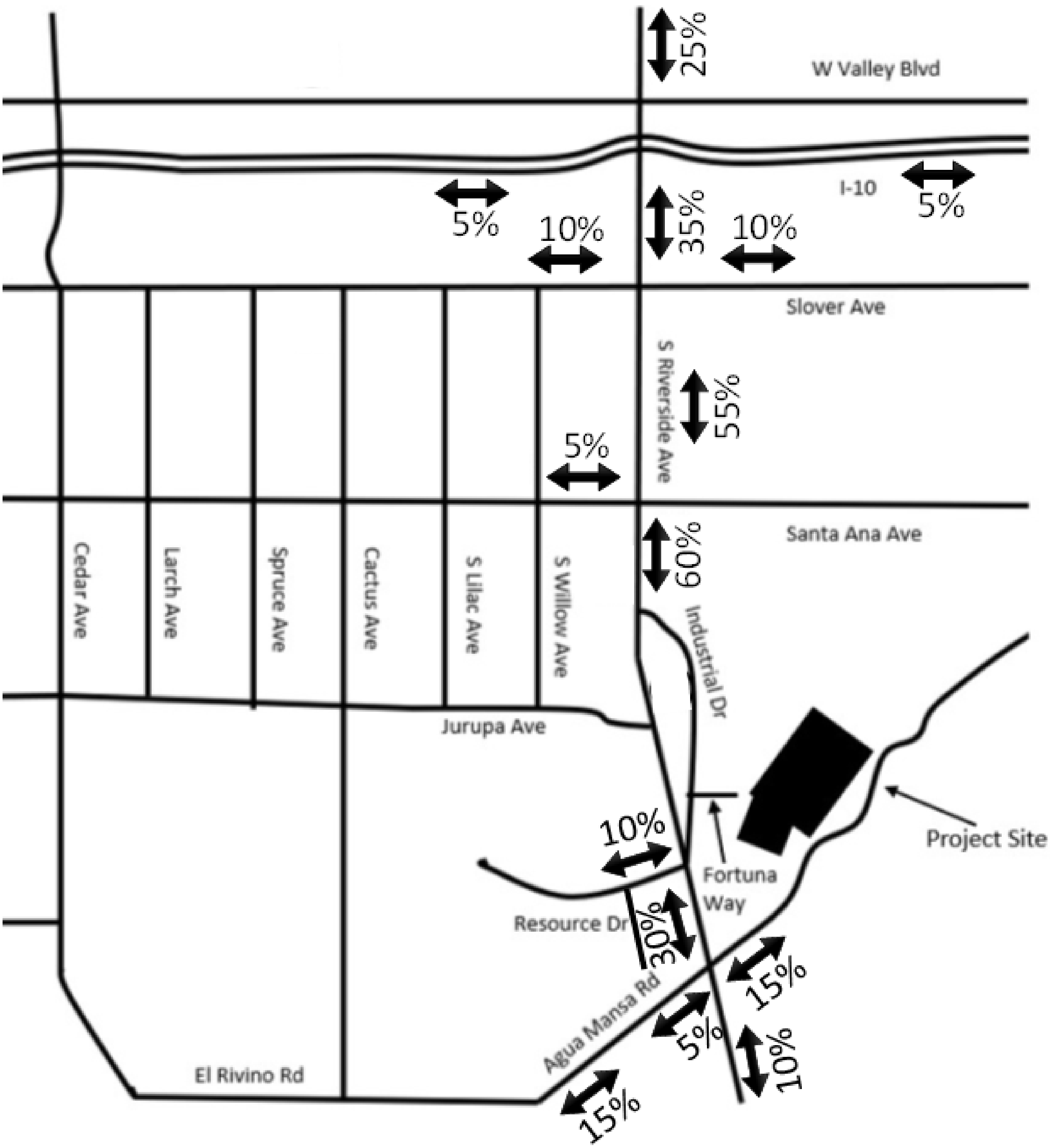
Attachment 3
Angelus Block Co., Inc.

Study Area



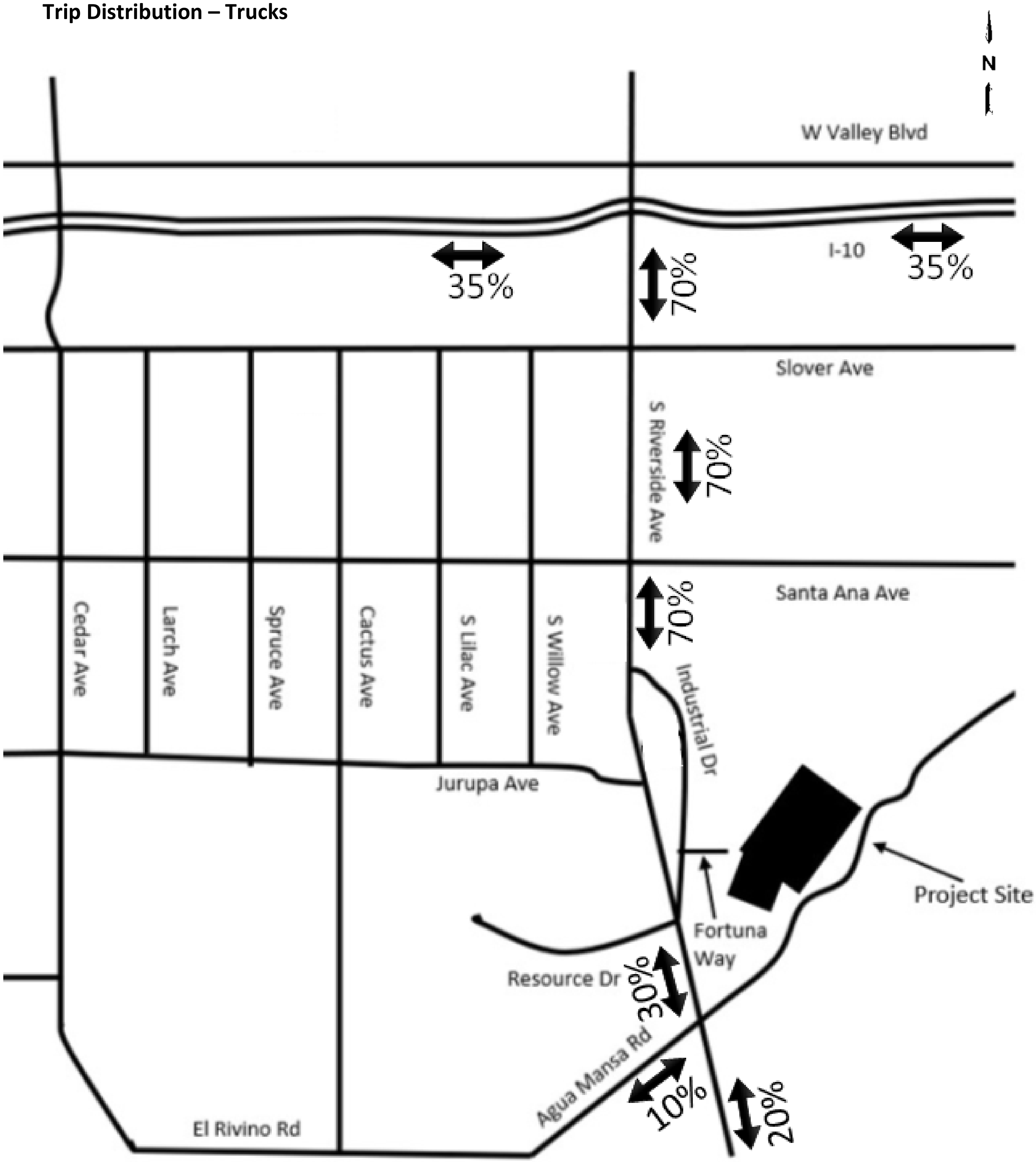
Attachment 4
Angelus Block Co., Inc.

Trip Distribution – Passenger Cars



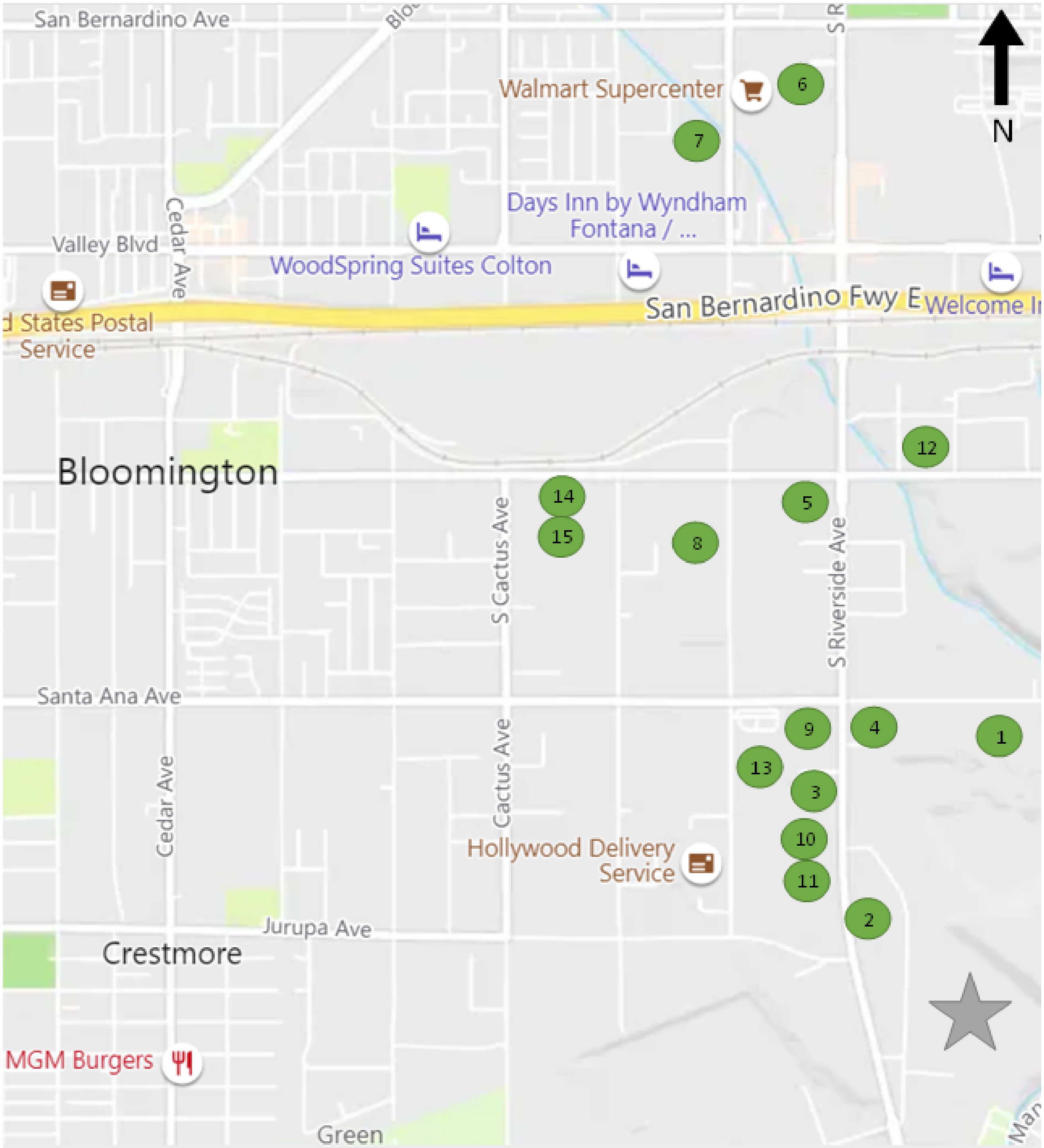
Attachment 5
Angelus Block Co., Inc.

Trip Distribution – Trucks



Attachment 6
Angelus Block Co., Inc.

Location of Cumulative Projects

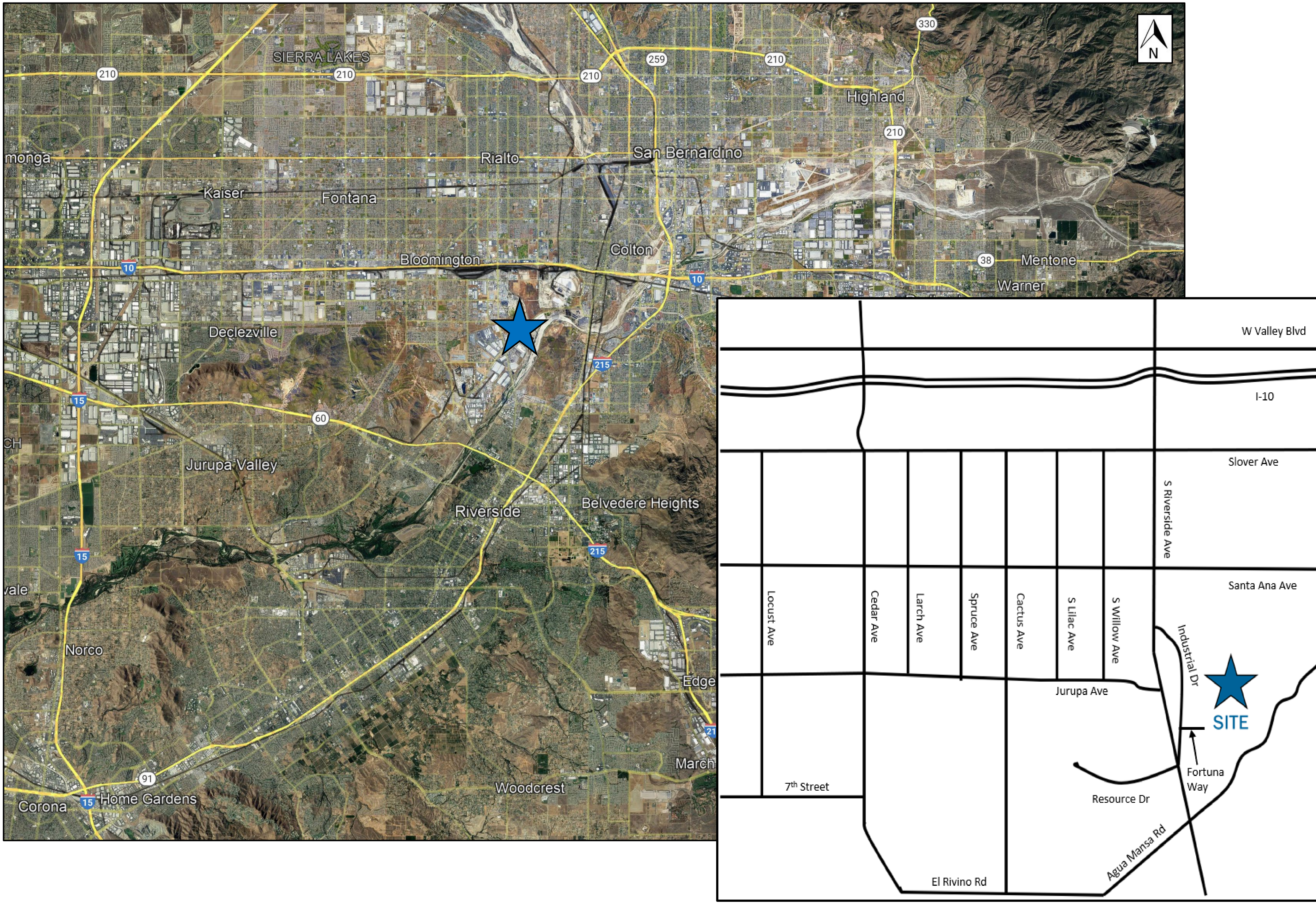


Attachment 7
Angelus Block Co., Inc. Summary of
Cumulative Projects

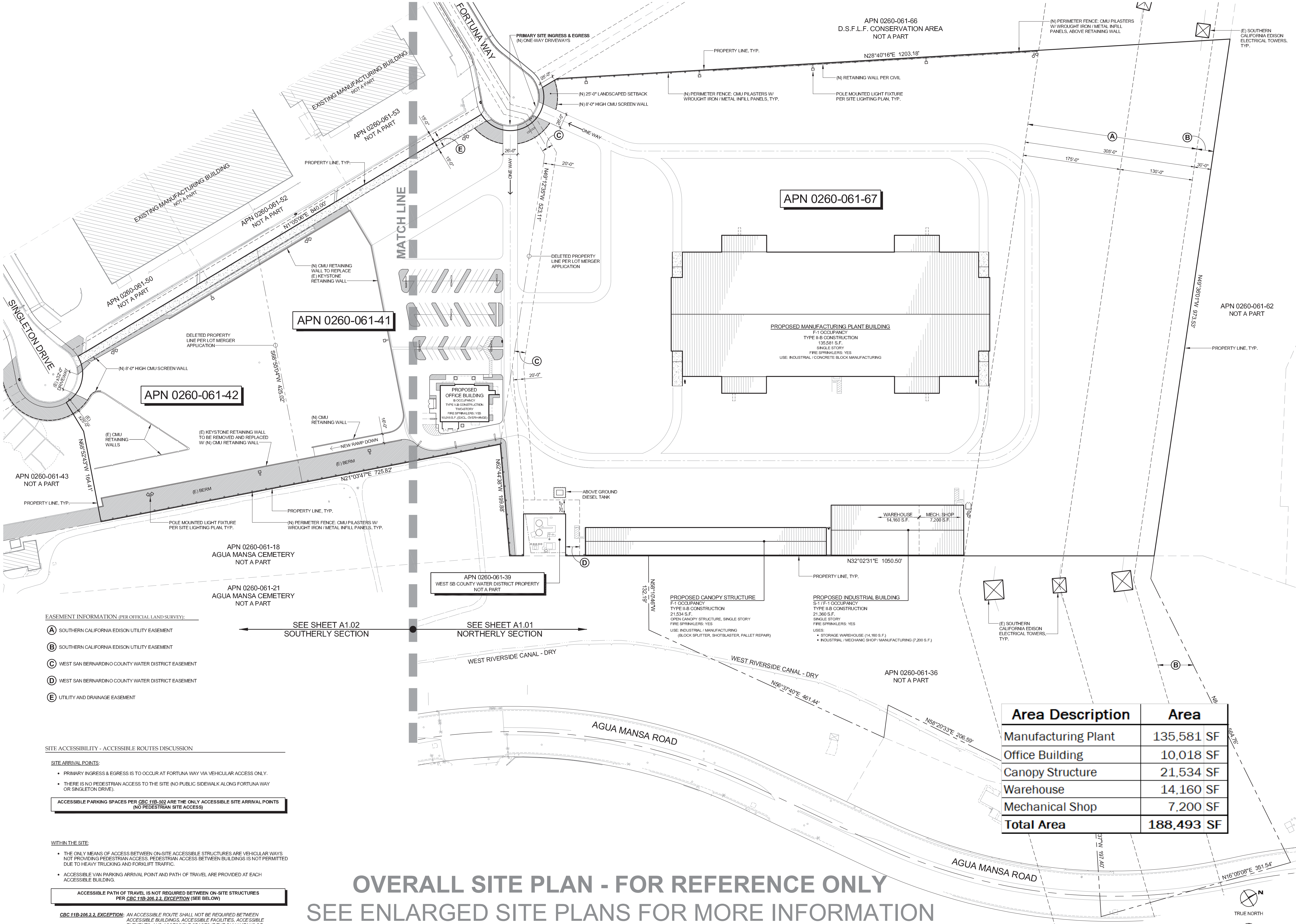
ID	Project Name	Land Use	Quantity	Units
1	South of Santa Ana Ave, East of Riverside Ave	Warehouse	370	TSF
2	SEC of Riverside Ave and Industrial Dr.	Trucking	3.58	AC
3	NWC of Riverside Ave and Industrial Dr.	Truck Drop	3.36	AC
4	SEC of Riversdie Ave and Santa Ana Ave.	Super Conveniant Market/Gas Station	16	VFP
		Diesel Station	2	VFP
5	SWC of Riversdie Ave and Slover Ave.	Fast Food w/Drive Thru	5.2	TSF
6	North of Valley Blvd and west of Riverside Ave.	Warehouse	492.41	TSF
7	Valley/Willow Warehouse	Warehouse	492.41	TSF
8	Old Dominion Expansion	Parking Lot (407 Spaces)	7.78	AC
9	SC Fuels	Fuel Storage/Service	54.46	TSF
10	Lynn Trucking	Truck Parking Yard	3.07	AC
		Car Wash/Repair	8.827	TSF
11	Riverside Pallet Yard	Pallet Yard	3.58	AC
12	Onyx Paving	Contractor's Yard	0.77	AC
13	Bakery Addition	Bakery	14	TSF
14	Flyers Energy Addition	Warehouse	9.35	TSF
15	Lilac Avenue Truck Terminal	Trucking	9.44	AC

Appendix B – Vicinity Map

Angelus Block Co. Site Vicinity Map



Appendix C – Site Plan



Area Description	Area
Manufacturing Plant	135,581 SF
Office Building	10,018 SF
Canopy Structure	21,534 SF
Warehouse	14,160 SF
Mechanical Shop	7,200 SF
Total Area	**188,493 SF**

EASEMENT INFORMATION (PER OFFICIAL LAND SURVEY):

- (A) SOUTHERN CALIFORNIA EDISON UTILITY EASEMENT
- (B) SOUTHERN CALIFORNIA EDISON UTILITY EASEMENT
- (C) WEST SAN BERNARDINO COUNTY WATER DISTRICT EASEMENT
- (D) WEST SAN BERNARDINO COUNTY WATER DISTRICT EASEMENT
- (E) UTILITY AND DRAINAGE EASEMENT

SITE ACCESSIBILITY - ACCESSIBLE ROUTES DISCUSSION

SITE ARRIVAL POINTS:

- PRIMARY INGRESS & EGRESS IS TO OCCUR AT FORTUNA WAY VIA VEHICULAR ACCESS ONLY.
- THERE IS NO PEDESTRIAN ACCESS TO THE SITE (NO PUBLIC SIDEWALK ALONG FORTUNA WAY OR SINGLETON DRIVE).

ACCESSIBLE PARKING SPACES PER CBC 11B-502 ARE THE ONLY ACCESSIBLE SITE ARRIVAL POINTS (NO PEDESTRIAN SITE ACCESS)

WITHIN THE SITE:

- THE ONLY MEANS OF ACCESS BETWEEN ON-SITE ACCESSIBLE STRUCTURES ARE VEHICULAR WAYS NOT PROVIDING PEDESTRIAN ACCESS. PEDESTRIAN ACCESS BETWEEN BUILDINGS IS NOT PERMITTED DUE TO HEAVY TRUCKING AND FORKLIFT TRAFFIC.
- ACCESSIBLE VAN PARKING ARRIVAL POINT AND PATH OF TRAVEL ARE PROVIDED AT EACH ACCESSIBLE BUILDING.

ACCESSIBLE PATH OF TRAVEL IS NOT REQUIRED BETWEEN ON-SITE STRUCTURES PER CBC 11B-206.2.2, EXCEPTION (SEE BELOW)

CBC 11B-206.2.2, EXCEPTION: AN ACCESSIBLE ROUTE SHALL NOT BE REQUIRED BETWEEN ACCESSIBLE BUILDINGS, ACCESSIBLE FACILITIES, ACCESSIBLE ELEMENTS, AND ACCESSIBLE SPACES IF THE ONLY MEANS OF ACCESS BETWEEN THEM IS A VEHICULAR WAY NOT PROVIDING PEDESTRIAN ACCESS.

OVERALL SITE PLAN - FOR REFERENCE ONLY

SEE ENLARGED SITE PLANS FOR MORE INFORMATION

ANGELUS BLOCK CO., INC.
PROPOSED MANUFACTURING FACILITY
APN'S: 0260-061-67-0000, 0260-061-41-0000, 0260-061-42-0000
RIALTO, CA 92316

LICENSED ARCHITECT FRANK J. LONI C-35616 STATE OF CALIFORNIA

LONI architects
LONI, INC. architecture + engineering
www.loniarchitects.com

Drawn By F. LONI
Signed 2/10/2021
Sheet A1.00
Job Number 19-050

OVERALL REFERENCE SITE PLAN | 1" = 60'-0" | 1

Appendix D – Historic Traffic Counts (in lieu of new existing counts)

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:	LOCATION:	Rialto	PROJECT #:	SC2522
Wed, Feb 12, 20	NORTH & SOUTH:	Riverside	LOCATION #:	1
	EAST & WEST:	Valley	CONTROL:	SIGNAL

NOTES:

Queue SB AM

AM
PM
MD
OTHER
OTHER

▲
N
◄ W
E ►
S
▼

Add U-Turns to Left Turns

	NORTHBOUND Riverside			SOUTHBOUND Riverside			EASTBOUND Valley			WESTBOUND Valley			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	2	2.5	0.5	1	2.5	0.5	1	2	1	1	2	1	
AM													
7:00 AM	60	139	34	16	278	7	5	45	119	34	43	9	789
7:15 AM	90	155	17	12	259	6	10	31	147	54	34	4	819
7:30 AM	89	160	35	12	317	7	7	50	134	35	48	11	905
7:45 AM	89	153	53	18	252	8	12	47	114	28	31	8	813
8:00 AM	52	140	41	10	246	16	10	70	116	29	33	15	778
8:15 AM	66	144	47	18	202	8	13	35	88	36	54	12	723
8:30 AM	65	157	37	13	196	13	16	39	99	26	36	17	714
8:45 AM	77	192	31	8	176	11	11	31	84	33	26	13	693
VOLUMES	588	1,240	295	107	1,926	76	84	348	901	275	305	89	6,234
APPROACH %	28%	58%	14%	5%	91%	4%	6%	26%	68%	41%	46%	13%	
APP/DEPART	2,123	/	1,412	2,109	/	3,108	1,333	/	751	669	/	963	0
BEGIN PEAK HR		7:00 AM											
VOLUMES	328	607	139	58	1,106	28	34	173	514	151	156	32	3,326
APPROACH %	31%	57%	13%	5%	93%	2%	5%	24%	71%	45%	46%	9%	
PEAK HR FACTOR		0.910			0.887			0.944			0.902		0.919
APP/DEPART	1,074	/	671	1,192	/	1,776	721	/	370	339	/	509	0
PM													
4:00 PM	130	363	49	20	198	12	13	66	118	39	77	29	1,114
4:15 PM	114	290	36	18	202	13	22	65	110	39	46	28	983
4:30 PM	101	338	47	16	185	6	21	60	122	24	54	31	1,005
4:45 PM	124	305	36	19	198	15	23	61	122	46	79	28	1,056
5:00 PM	135	302	64	16	191	12	23	62	120	45	67	38	1,075
5:15 PM	143	313	31	21	162	7	14	72	129	42	85	31	1,050
5:30 PM	141	335	32	22	232	20	31	56	106	39	64	29	1,107
5:45 PM	123	283	29	19	186	16	25	51	93	30	54	24	933
VOLUMES	1,011	2,529	324	151	1,554	101	172	493	920	304	526	238	8,323
APPROACH %	26%	65%	8%	8%	86%	6%	11%	31%	58%	28%	49%	22%	
APP/DEPART	3,864	/	2,935	1,806	/	2,773	1,585	/	971	1,068	/	1,644	0
BEGIN PEAK HR		4:45 PM											
VOLUMES	543	1,255	163	78	783	54	91	251	477	172	295	126	4,288
APPROACH %	28%	64%	8%	9%	86%	6%	11%	31%	58%	29%	50%	21%	
PEAK HR FACTOR		0.965			0.835			0.952			0.938		0.968
APP/DEPART	1,961	/	1,466	915	/	1,429	819	/	494	593	/	899	0

U-TURNS					
	NB	SB	EB	WB	TTL
LANES	0	0	0	0	
7:00 AM	2	1	1	0	4
7:15 AM	1	1	2	1	5
7:30 AM	3	0	0	0	3
7:45 AM	1	0	1	1	3
8:00 AM	2	2	1	0	5
8:15 AM	1	1	0	1	3
8:30 AM	1	0	1	1	3
8:45 AM	1	0	0	2	3
VOLUMES	12	5	6	6	29
4:00 PM	1	0	1	0	2
4:15 PM	1	0	0	2	3
4:30 PM	0	1	0	1	2
4:45 PM	0	0	5	0	5
5:00 PM	1	0	3	0	4
5:15 PM	1	0	0	4	5
5:30 PM	0	3	1	1	5
5:45 PM	0	2	0	1	3
VOLUMES	4	6	10	9	29

Riverside

NORTH SIDE

Valley WEST SIDE

EAST SIDE **Valley**

SOUTH SIDE

Riverside

National Data & Surveying Services **Intersection Turning Movement Count**

Location: S Riverside Ave & I-10 WB Ramps
City: Rialto
Control: Signalized

Project ID: Historical
Date: 4/12/2018

Total

NS/EW Streets:	S Riverside Ave				S Riverside Ave				I-10 WB Ramps				I-10 WB Ramps				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	2	3	0	0	0	4	1	0	0	0	0	0	1.3	0.3	1.3	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	36	194	0	5	0	241	145	0	0	0	0	0	111	2	95	0	829
7:15 AM	37	185	0	3	0	253	146	0	0	0	0	0	106	1	89	0	820
7:30 AM	30	211	0	2	0	270	141	0	0	0	0	0	90	1	88	0	833
7:45 AM	45	230	0	3	0	233	86	0	0	0	0	0	113	1	78	0	789
8:00 AM	35	176	0	0	0	248	123	0	0	0	0	0	94	0	64	0	740
8:15 AM	37	163	0	3	0	238	119	0	0	0	0	0	87	3	86	0	736
8:30 AM	48	184	0	2	0	225	114	0	0	0	0	0	81	0	96	0	750
8:45 AM	45	201	0	0	0	199	102	0	0	0	0	0	71	0	80	0	698
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	313	1544	0	18	0	1907	976	0	0	0	0	0	753	8	676	0	6195
APPROACH %'s :	16.69%	82.35%	0.00%	0.96%	0.00%	66.15%	33.85%	0.00%					52.40%	0.56%	47.04%	0.00%	
PEAK HR :	07:00 AM - 08:00 AM																TOTAL
PEAK HR VOL :	148	820	0	13	0	997	518	0	0	0	0	0	420	5	350	0	3271
PEAK HR FACTOR :	0.822	0.891	0.000	0.650	0.000	0.923	0.887	0.000	0.000	0.000	0.000	0.000	0.929	0.625	0.921	0.000	0.982
	0.882				0.922								0.931				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	2	3	0	0	0	4	1	0	0	0	0	0	1.3	0.3	1.3	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	58	356	0	0	0	266	102	0	0	0	0	0	93	1	127	0	1003
4:15 PM	51	343	0	1	0	252	104	0	0	0	0	0	90	0	118	0	959
4:30 PM	61	356	0	0	0	294	97	0	0	0	0	0	95	0	144	0	1047
4:45 PM	61	357	0	0	0	263	89	0	0	0	0	0	99	0	112	0	981
5:00 PM	60	374	0	0	0	301	92	0	0	0	0	0	114	0	109	0	1050
5:15 PM	59	385	0	0	0	261	96	0	0	0	0	0	116	2	143	0	1062
5:30 PM	49	368	0	0	0	266	105	0	0	0	0	0	121	1	119	0	1029
5:45 PM	52	361	0	0	0	244	84	0	0	0	0	0	113	0	98	0	952
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	451	2900	0	1	0	2147	769	0	0	0	0	0	841	4	970	0	8083
APPROACH %'s :	13.45%	86.52%	0.00%	0.03%	0.00%	73.63%	26.37%	0.00%					46.34%	0.22%	53.44%	0.00%	
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	241	1472	0	0	0	1119	374	0	0	0	0	0	424	2	508	0	4140
PEAK HR FACTOR :	0.988	0.956	0.000	0.000	0.000	0.929	0.964	0.000	0.000	0.000	0.000	0.000	0.914	0.250	0.882	0.000	0.975
	0.965				0.950								0.895				

National Data & Surveying Services Intersection Turning Movement Count

Location: S Riverside Ave & I-10 WB Ramps
City: Rialto
Control: Signalized

Project ID: Historical
Date: 4/12/2018

Cars

NS/EW Streets:	S Riverside Ave				S Riverside Ave				I-10 WB Ramps				I-10 WB Ramps				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	2	3	0	0	0	4	1	0	0	0	0	0	1.3	0.3	1.3	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	12	181	0	5	0	232	141	0	0	0	0	0	90	2	94	0	757
7:15 AM	9	168	0	3	0	245	146	0	0	0	0	0	88	1	87	0	747
7:30 AM	15	199	0	2	0	268	136	0	0	0	0	0	75	1	84	0	780
7:45 AM	19	221	0	3	0	227	84	0	0	0	0	0	97	1	72	0	724
8:00 AM	17	165	0	0	0	240	122	0	0	0	0	0	70	0	62	0	676
8:15 AM	11	145	0	3	0	225	113	0	0	0	0	0	46	3	81	0	627
8:30 AM	14	169	0	2	0	212	110	0	0	0	0	0	55	0	91	0	653
8:45 AM	19	184	0	0	0	179	97	0	0	0	0	0	57	0	80	0	616
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	116	1432	0	18	0	1828	949	0	0	0	0	0	578	8	651	0	5580
APPROACH %'s :	7.41%	91.44%	0.00%	1.15%	0.00%	65.83%	34.17%	0.00%					46.73%	0.65%	52.63%	0.00%	
PEAK HR :	07:00 AM - 08:00 AM																TOTAL
PEAK HR VOL :	55	769	0	13	0	972	507	0	0	0	0	0	350	5	337	0	3008
PEAK HR FACTOR :	0.72	0.870	0.000	0.650	0.000	0.907	0.868	0.000	0.000	0.000	0.000	0.000	0.902	0.625	0.896	0.000	0.964
	0.861				0.915								0.930				

	S Riverside Ave				S Riverside Ave				I-10 WB Ramps				I-10 WB Ramps				
PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	2	3	0	0	0	4	1	0	0	0	0	0	1.3	0.3	1.3	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	41	348	0	0	0	255	100	0	0	0	0	0	74	0	124	0	942
4:15 PM	38	332	0	0	0	240	101	0	0	0	0	0	61	0	114	0	886
4:30 PM	46	345	0	0	0	289	94	0	0	0	0	0	67	0	140	0	981
4:45 PM	48	346	0	0	0	256	85	0	0	0	0	0	79	0	108	0	922
5:00 PM	46	365	0	0	0	292	90	0	0	0	0	0	94	0	109	0	996
5:15 PM	49	375	0	0	0	254	94	0	0	0	0	0	105	2	140	0	1019
5:30 PM	39	363	0	0	0	258	101	0	0	0	0	0	101	1	115	0	978
5:45 PM	39	356	0	0	0	240	84	0	0	0	0	0	80	0	95	0	894
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	346	2830	0	0	0	2084	749	0	0	0	0	0	661	3	945	0	7618
APPROACH %'s :	10.89%	89.11%	0.00%	0.00%	0.00%	73.56%	26.44%	0.00%					41.08%	0.19%	58.73%	0.00%	
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	189	1431	0	0	0	1091	363	0	0	0	0	0	345	2	497	0	3918
PEAK HR FACTOR :	0.96	0.954	0.000	0.000	0.000	0.934	0.965	0.000	0.000	0.000	0.000	0.000	0.821	0.250	0.888	0.000	0.961
	0.955				0.949								0.854				

National Data & Surveying Services Intersection Turning Movement Count

Location: S Riverside Ave & I-10 WB Ramps
City: Rialto
Control: Signalized

Project ID: Historical
Date: 4/12/2018

2axle

NS/EW Streets:	S Riverside Ave				S Riverside Ave				I-10 WB Ramps				I-10 WB Ramps				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	2	3	0	0	0	4	1	0	0	0	0	0	1.3	0.3	1.3	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	6	4	0	0	0	7	1	0	0	0	0	0	5	0	1	0	24
7:15 AM	5	8	0	0	0	5	0	0	0	0	0	0	9	0	2	0	29
7:30 AM	4	6	0	0	0	1	3	0	0	0	0	0	4	0	3	0	21
7:45 AM	3	5	0	0	0	5	1	0	0	0	0	0	1	0	5	0	20
8:00 AM	2	4	0	0	0	3	0	0	0	0	0	0	2	0	2	0	13
8:15 AM	4	8	0	0	0	10	1	0	0	0	0	0	4	0	4	0	31
8:30 AM	7	3	0	0	0	11	1	0	0	0	0	0	3	0	4	0	29
8:45 AM	6	9	0	0	0	12	3	0	0	0	0	0	2	0	0	0	32
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	37	47	0	0	0	54	10	0	0	0	0	0	30	0	21	0	199
APPROACH %'s :	44.05%	55.95%	0.00%	0.00%	0.00%	84.38%	15.63%	0.00%					58.82%	0.00%	41.18%	0.00%	
PEAK HR :	07:00 AM - 08:00 AM																TOTAL
PEAK HR VOL :	18	23	0	0	0	18	5	0	0	0	0	0	19	0	11	0	94
PEAK HR FACTOR :	0.750	0.719	0.000	0.000	0.000	0.643	0.417	0.000	0.000	0.000	0.000	0.000	0.528	0.000	0.550	0.000	0.810
	0.788				0.719								0.682				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	2	3	0	0	0	4	1	0	0	0	0	0	1.3	0.3	1.3	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	2	3	0	0	0	6	0	0	0	0	0	0	3	1	2	0	17
4:15 PM	0	1	0	0	0	9	3	0	0	0	0	0	5	0	2	0	20
4:30 PM	3	7	0	0	0	1	0	0	0	0	0	0	4	0	3	0	18
4:45 PM	2	6	0	0	0	4	0	0	0	0	0	0	4	0	3	0	19
5:00 PM	0	4	0	0	0	4	0	0	0	0	0	0	4	0	0	0	12
5:15 PM	1	8	0	0	0	1	2	0	0	0	0	0	2	0	1	0	15
5:30 PM	0	1	0	0	0	2	1	0	0	0	0	0	3	0	2	0	9
5:45 PM	1	2	0	0	0	3	0	0	0	0	0	0	4	0	1	0	11
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	9	32	0	0	0	30	6	0	0	0	0	0	29	1	14	0	121
APPROACH %'s :	21.95%	78.05%	0.00%	0.00%	0.00%	83.33%	16.67%	0.00%					65.91%	2.27%	31.82%	0.00%	
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	6	25	0	0	0	10	2	0	0	0	0	0	14	0	7	0	64
PEAK HR FACTOR :	0.50	0.781	0.000	0.000	0.000	0.625	0.250	0.000	0.000	0.000	0.000	0.000	0.875	0.000	0.583	0.000	0.842
	0.775				0.750								0.750				

National Data & Surveying Services Intersection Turning Movement Count

Location: S Riverside Ave & I-10 WB Ramps
City: Rialto
Control: Signalized

Project ID: Historical
Date: 4/12/2018

3axle

NS/EW Streets:	S Riverside Ave				S Riverside Ave				I-10 WB Ramps				I-10 WB Ramps				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	2	3	0	0	0	4	1	0	0	0	0	0	1.3	0.3	1.3	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	4	1	0	0	0	0	0	0	0	0	0	0	4	0	0	0	9
7:15 AM	6	1	0	0	0	1	0	0	0	0	0	0	1	0	0	0	9
7:30 AM	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
7:45 AM	2	2	0	0	0	1	0	0	0	0	0	0	2	0	0	0	7
8:00 AM	4	3	0	0	0	3	0	0	0	0	0	0	4	0	0	0	14
8:15 AM	5	4	0	0	0	1	0	0	0	0	0	0	4	0	0	0	14
8:30 AM	4	3	0	0	0	1	1	0	0	0	0	0	3	0	0	0	12
8:45 AM	4	3	0	0	0	3	0	0	0	0	0	0	3	0	0	0	13
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	34	17	0	0	0	10	1	0	0	0	0	0	21	0	0	0	83
APPROACH %'s :	66.67%	33.33%	0.00%	0.00%	0.00%	90.91%	9.09%	0.00%					100.00%	0.00%	0.00%	0.00%	
PEAK HR :	07:00 AM - 08:00 AM																TOTAL
PEAK HR VOL :	17	4	0	0	0	2	0	0	0	0	0	0	7	0	0	0	30
PEAK HR FACTOR :	0.708	0.500	0.000	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.438	0.000	0.000	0.000	0.833
	0.750				0.500								0.438				

	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
PM	2	3	0	0	0	4	1	0	0	0	0	0	1.3	0.3	1.3	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	5	0	0	0	0	0	1	0	0	0	0	0	2	0	0	0	8
4:15 PM	4	6	0	1	0	2	0	0	0	0	0	0	4	0	0	0	17
4:30 PM	3	1	0	0	0	1	2	0	0	0	0	0	2	0	1	0	10
4:45 PM	1	2	0	0	0	1	2	0	0	0	0	0	4	0	0	0	10
5:00 PM	3	2	0	0	0	2	1	0	0	0	0	0	1	0	0	0	9
5:15 PM	2	1	0	0	0	4	0	0	0	0	0	0	2	0	0	0	9
5:30 PM	2	1	0	0	0	1	2	0	0	0	0	0	0	0	0	0	6
5:45 PM	3	2	0	0	0	1	0	0	0	0	0	0	9	0	1	0	16
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	23	15	0	1	0	12	8	0	0	0	0	0	24	0	2	0	85
APPROACH %'s :	58.97%	38.46%	0.00%	2.56%	0.00%	60.00%	40.00%	0.00%					92.31%	0.00%	7.69%	0.00%	
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	9	6	0	0	0	8	5	0	0	0	0	0	9	0	1	0	38
PEAK HR FACTOR :	0.75	0.750	0.000	0.000	0.000	0.500	0.625	0.000	0.000	0.000	0.000	0.000	0.563	0.000	0.250	0.000	0.950
	0.750				0.813								0.625				

National Data & Surveying Services Intersection Turning Movement Count

Location: S Riverside Ave & I-10 WB Ramps
City: Rialto
Control: Signalized

Project ID: Historical
Date: 4/12/2018

4axle

NS/EW Streets:	S Riverside Ave				S Riverside Ave				I-10 WB Ramps				I-10 WB Ramps				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	2	3	0	0	0	4	1	0	0	0	0	0	1.3	0.3	1.3	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	14	8	0	0	0	2	3	0	0	0	0	0	12	0	0	0	39
7:15 AM	17	8	0	0	0	2	0	0	0	0	0	0	8	0	0	0	35
7:30 AM	6	6	0	0	0	1	2	0	0	0	0	0	11	0	1	0	27
7:45 AM	21	2	0	0	0	0	1	0	0	0	0	0	13	0	1	0	38
8:00 AM	12	4	0	0	0	2	1	0	0	0	0	0	18	0	0	0	37
8:15 AM	17	6	0	0	0	2	5	0	0	0	0	0	33	0	1	0	64
8:30 AM	23	9	0	0	0	1	2	0	0	0	0	0	20	0	1	0	56
8:45 AM	16	5	0	0	0	5	2	0	0	0	0	0	9	0	0	0	37
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	126	48	0	0	0	15	16	0	0	0	0	0	124	0	4	0	333
APPROACH %'s :	72.41%	27.59%	0.00%	0.00%	0.00%	48.39%	51.61%	0.00%					96.88%	0.00%	3.13%	0.00%	
PEAK HR :	07:00 AM - 08:00 AM																TOTAL
PEAK HR VOL :	58	24	0	0	0	5	6	0	0	0	0	0	44	0	2	0	139
PEAK HR FACTOR :	0.690	0.750	0.000	0.000	0.000	0.625	0.500	0.000	0.000	0.000	0.000	0.000	0.846	0.000	0.500	0.000	0.891
	0.820				0.550								0.821				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	2	3	0	0	0	4	1	0	0	0	0	0	1.3	0.3	1.3	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	10	5	0	0	0	5	1	0	0	0	0	0	14	0	1	0	36
4:15 PM	9	4	0	0	0	1	0	0	0	0	0	0	20	0	2	0	36
4:30 PM	9	3	0	0	0	3	1	0	0	0	0	0	22	0	0	0	38
4:45 PM	10	3	0	0	0	2	2	0	0	0	0	0	12	0	1	0	30
5:00 PM	11	3	0	0	0	3	1	0	0	0	0	0	15	0	0	0	33
5:15 PM	7	1	0	0	0	2	0	0	0	0	0	0	7	0	2	0	19
5:30 PM	8	3	0	0	0	5	1	0	0	0	0	0	17	0	2	0	36
5:45 PM	9	1	0	0	0	0	0	0	0	0	0	0	20	0	1	0	31
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	73	23	0	0	0	21	6	0	0	0	0	0	127	0	9	0	259
APPROACH %'s :	76.04%	23.96%	0.00%	0.00%	0.00%	77.78%	22.22%	0.00%					93.38%	0.00%	6.62%	0.00%	
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	37	10	0	0	0	10	4	0	0	0	0	0	56	0	3	0	120
PEAK HR FACTOR :	0.84	0.833	0.000	0.000	0.000	0.833	0.500	0.000	0.000	0.000	0.000	0.000	0.636	0.000	0.375	0.000	0.789
	0.839				0.875								0.670				

National Data & Surveying Services

Intersection Turning Movement Count

Location: S Riverside Ave & I-10 EB Ramps
City: Rialto
Control: Signalized

Project ID: Historical
Date: 4/12/2018

Total

NS/EW Streets:	S Riverside Ave				S Riverside Ave				I-10 EB Ramps				I-10 EB Ramps				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	2.5	0.5	0	2	2	0	0	1.3	0.3	1.3	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	169	75	1	75	261	0	2	64	2	61	0	0	0	0	0	710
7:15 AM	0	156	51	0	106	271	0	0	72	4	70	0	0	0	0	0	730
7:30 AM	0	154	71	0	103	251	0	0	88	0	90	0	0	0	0	0	757
7:45 AM	0	188	71	0	89	263	0	0	88	1	102	0	0	0	0	0	802
8:00 AM	0	153	71	0	97	260	0	0	65	0	61	0	0	0	0	0	707
8:15 AM	0	141	80	0	94	240	0	0	73	0	79	0	0	0	0	0	707
8:30 AM	0	142	63	0	115	199	0	1	84	1	67	0	0	0	0	0	672
8:45 AM	0	181	112	0	85	187	0	0	78	1	61	0	0	0	0	0	705
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	1284	594	1	764	1932	0	3	612	9	591	0	0	0	0	0	5790
APPROACH %'s :	0.00%	68.33%	31.61%	0.05%	28.31%	71.58%	0.00%	0.11%	50.50%	0.74%	48.76%	0.00%					
PEAK HR :	07:00 AM - 08:00 AM																TOTAL
PEAK HR VOL :	0	667	268	1	373	1046	0	2	312	7	323	0	0	0	0	0	2999
PEAK HR FACTOR :	0.000	0.887	0.893	0.250	0.880	0.965	0.000	0.250	0.886	0.438	0.792	0.000	0.000	0.000	0.000	0.000	0.935
	0.903				0.942				0.840								

	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
PM	0	2.5	0.5	0	2	2	0	0	1.3	0.3	1.3	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	259	115	0	123	236	0	0	159	0	69	0	0	0	0	0	961
4:15 PM	0	255	141	0	118	218	0	0	140	0	73	0	0	0	0	0	945
4:30 PM	0	300	124	0	140	259	0	0	122	0	50	0	0	0	0	0	995
4:45 PM	0	289	116	0	103	266	0	0	126	1	50	0	0	0	0	0	951
5:00 PM	0	285	129	0	124	293	0	0	152	0	65	0	0	0	0	0	1048
5:15 PM	0	316	125	0	100	274	0	0	140	0	96	0	0	0	0	0	1051
5:30 PM	0	290	106	0	97	290	0	0	126	0	81	0	0	0	0	0	990
5:45 PM	0	279	131	0	115	265	0	1	146	0	64	0	0	0	0	0	1001
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	2273	987	0	920	2101	0	1	1111	1	548	0	0	0	0	0	7942
APPROACH %'s :	0.00%	69.72%	30.28%	0.00%	30.44%	69.52%	0.00%	0.03%	66.93%	0.06%	33.01%	0.00%					
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	0	1170	491	0	436	1122	0	1	564	0	306	0	0	0	0	0	4090
PEAK HR FACTOR :	0.000	0.926	0.937	0.000	0.879	0.957	0.000	0.250	0.928	0.000	0.797	0.000	0.000	0.000	0.000	0.000	0.973
	0.942				0.935				0.922								

National Data & Surveying Services Intersection Turning Movement Count

Location: S Riverside Ave & I-10 EB Ramps
City: Rialto
Control: Signalized

Project ID: Historical
Date: 4/12/2018

Cars

NS/EW Streets:	S Riverside Ave				S Riverside Ave				I-10 EB Ramps				I-10 EB Ramps				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	2.5	0.5	0	2	2	0	0	1.3	0.3	1.3	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	129	57	1	71	236	0	2	62	1	45	0	0	0	0	0	604
7:15 AM	0	120	35	0	102	249	0	0	66	3	56	0	0	0	0	0	631
7:30 AM	0	132	53	0	103	236	0	0	85	0	64	0	0	0	0	0	673
7:45 AM	0	153	50	0	86	242	0	0	86	1	81	0	0	0	0	0	699
8:00 AM	0	127	48	0	95	228	0	0	62	0	44	0	0	0	0	0	604
8:15 AM	0	104	50	0	85	196	0	0	63	0	58	0	0	0	0	0	556
8:30 AM	0	101	37	0	108	168	0	1	81	0	40	0	0	0	0	0	536
8:45 AM	0	141	66	0	80	158	0	0	71	1	31	0	0	0	0	0	548
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	1007	396	1	730	1713	0	3	576	6	419	0	0	0	0	0	4851
APPROACH %'s :	0.00%	71.72%	28.21%	0.07%	29.84%	70.03%	0.00%	0.12%	57.54%	0.60%	41.86%	0.00%					
PEAK HR :	07:00 AM - 08:00 AM																TOTAL
PEAK HR VOL :	0	534	195	1	362	963	0	2	299	5	246	0	0	0	0	0	2607
PEAK HR FACTOR :	0.00	0.873	0.855	0.250	0.879	0.967	0.000	0.250	0.869	0.417	0.759	0.000	0.000	0.000	0.000	0.000	0.932
	0.899				0.945				0.818								

	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
PM	0	2.5	0.5	0	2	2	0	0	1.3	0.3	1.3	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	239	97	0	120	208	0	0	157	0	53	0	0	0	0	0	874
4:15 PM	0	235	122	0	117	179	0	0	134	0	52	0	0	0	0	0	839
4:30 PM	0	281	103	0	139	228	0	0	114	0	31	0	0	0	0	0	896
4:45 PM	0	261	97	0	101	242	0	0	125	1	41	0	0	0	0	0	868
5:00 PM	0	270	110	0	122	268	0	0	149	0	44	0	0	0	0	0	963
5:15 PM	0	293	112	0	99	257	0	0	140	0	82	0	0	0	0	0	983
5:30 PM	0	279	93	0	96	261	0	0	124	0	64	0	0	0	0	0	917
5:45 PM	0	261	112	0	114	229	0	1	145	0	41	0	0	0	0	0	903
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	2119	846	0	908	1872	0	1	1088	1	408	0	0	0	0	0	7243
APPROACH %'s :	0.00%	71.47%	28.53%	0.00%	32.65%	67.31%	0.00%	0.04%	72.68%	0.07%	27.25%	0.00%					
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	0	1103	427	0	431	1015	0	1	558	0	231	0	0	0	0	0	3766
PEAK HR FACTOR :	0.00	0.941	0.953	0.000	0.883	0.947	0.000	0.250	0.936	0.000	0.704	0.000	0.000	0.000	0.000	0.000	0.958
	0.944				0.928				0.889								

National Data & Surveying Services Intersection Turning Movement Count

Location: S Riverside Ave & I-10 EB Ramps
City: Rialto
Control: Signalized

Project ID: Historical
Date: 4/12/2018

2axle

NS/EW Streets:	S Riverside Ave				S Riverside Ave				I-10 EB Ramps				I-10 EB Ramps				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	2.5	0.5	0	2	2	0	0	1.3	0.3	1.3	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	14	2	0	3	8	0	0	1	1	1	0	0	0	0	0	30
7:15 AM	0	4	3	0	2	11	0	0	6	1	2	0	0	0	0	0	29
7:30 AM	0	8	5	0	0	4	0	0	2	0	2	0	0	0	0	0	21
7:45 AM	0	8	2	0	3	4	0	0	0	0	6	0	0	0	0	0	23
8:00 AM	0	6	4	0	1	6	0	0	1	0	5	0	0	0	0	0	23
8:15 AM	0	7	5	0	6	8	0	0	6	0	2	0	0	0	0	0	34
8:30 AM	0	8	6	0	6	7	0	0	1	1	3	0	0	0	0	0	32
8:45 AM	0	10	24	0	4	10	0	0	4	0	3	0	0	0	0	0	55
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	65	51	0	25	58	0	0	21	3	24	0	0	0	0	0	247
APPROACH %'s :	0.00%	56.03%	43.97%	0.00%	30.12%	69.88%	0.00%	0.00%	43.75%	6.25%	50.00%	0.00%					
PEAK HR :	07:00 AM - 08:00 AM																TOTAL
PEAK HR VOL :	0	34	12	0	8	27	0	0	9	2	11	0	0	0	0	0	103
PEAK HR FACTOR :	0.000	0.607	0.600	0.000	0.667	0.614	0.000	0.000	0.375	0.500	0.458	0.000	0.000	0.000	0.000	0.000	0.858
	0.719				0.673				0.611								

NS/EW Streets:	S Riverside Ave				S Riverside Ave				I-10 EB Ramps				I-10 EB Ramps				
PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	2.5	0.5	0	2	2	0	0	1.3	0.3	1.3	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	6	4	0	1	8	0	0	0	0	4	0	0	0	0	0	23
4:15 PM	0	1	2	0	1	12	0	0	0	0	4	0	0	0	0	0	20
4:30 PM	0	7	0	0	0	4	0	0	4	0	3	0	0	0	0	0	18
4:45 PM	0	9	2	0	1	8	0	0	0	0	0	0	0	0	0	0	20
5:00 PM	0	1	0	0	1	7	0	0	1	0	2	0	0	0	0	0	12
5:15 PM	0	6	4	0	0	3	0	0	0	0	1	0	0	0	0	0	14
5:30 PM	0	2	2	0	0	6	0	0	1	0	1	0	0	0	0	0	12
5:45 PM	0	4	3	0	1	5	0	0	0	0	3	0	0	0	0	0	16
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	36	17	0	5	53	0	0	6	0	18	0	0	0	0	0	135
APPROACH %'s :	0.00%	67.92%	32.08%	0.00%	8.62%	91.38%	0.00%	0.00%	25.00%	0.00%	75.00%	0.00%					
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	0	13	9	0	2	21	0	0	2	0	7	0	0	0	0	0	54
PEAK HR FACTOR :	0.00	0.542	0.563	0.000	0.500	0.750	0.000	0.000	0.500	0.000	0.583	0.000	0.000	0.000	0.000	0.000	0.844
	0.550				0.719				0.750								

National Data & Surveying Services **Intersection Turning Movement Count**

Location: S Riverside Ave & I-10 EB Ramps
City: Rialto
Control: Signalized

Project ID: Historical
Date: 4/12/2018

3axle

NS/EW Streets:	S Riverside Ave				S Riverside Ave				I-10 EB Ramps				I-10 EB Ramps				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	2.5	0.5	0	2	2	0	0	1.3	0.3	1.3	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	4	1	0	0	6	0	0	1	0	3	0	0	0	0	0	15
7:15 AM	0	8	2	0	1	1	0	0	0	0	3	0	0	0	0	0	15
7:30 AM	0	4	2	0	0	0	0	0	0	0	2	0	0	0	0	0	8
7:45 AM	0	4	5	0	0	3	0	0	1	0	2	0	0	0	0	0	15
8:00 AM	0	7	2	0	0	6	0	0	1	0	3	0	0	0	0	0	19
8:15 AM	0	6	4	0	1	3	0	0	1	0	2	0	0	0	0	0	17
8:30 AM	0	7	0	0	0	4	0	0	1	0	3	0	0	0	0	0	15
8:45 AM	0	6	4	0	1	5	0	0	1	0	4	0	0	0	0	0	21
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	46	20	0	3	28	0	0	6	0	22	0	0	0	0	0	125
APPROACH %'s :	0.00%	69.70%	30.30%	0.00%	9.68%	90.32%	0.00%	0.00%	21.43%	0.00%	78.57%	0.00%					
PEAK HR :	07:00 AM - 08:00 AM																TOTAL
PEAK HR VOL :	0	20	10	0	1	10	0	0	2	0	10	0	0	0	0	0	53
PEAK HR FACTOR :	0.000	0.625	0.500	0.000	0.250	0.417	0.000	0.000	0.500	0.000	0.833	0.000	0.000	0.000	0.000	0.000	0.883
	0.750				0.458				0.750								

NS/EW Streets:	S Riverside Ave				S Riverside Ave				I-10 EB Ramps				I-10 EB Ramps				
PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	2.5	0.5	0	2	2	0	0	1.3	0.3	1.3	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	4	2	0	0	2	0	0	0	0	4	0	0	0	0	0	12
4:15 PM	0	6	3	0	0	7	0	0	3	0	6	0	0	0	0	0	25
4:30 PM	0	4	2	0	0	4	0	0	0	0	6	0	0	0	0	0	16
4:45 PM	0	4	1	0	0	3	0	0	0	0	0	0	0	0	0	0	8
5:00 PM	0	4	3	0	0	3	0	0	1	0	5	0	0	0	0	0	16
5:15 PM	0	5	1	0	0	6	0	0	0	0	2	0	0	0	0	0	14
5:30 PM	0	3	3	0	0	1	0	0	0	0	6	0	0	0	0	0	13
5:45 PM	0	3	3	0	0	10	0	0	1	0	5	0	0	0	0	0	22
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	33	18	0	0	36	0	0	5	0	34	0	0	0	0	0	126
APPROACH %'s :	0.00%	64.71%	35.29%	0.00%	0.00%	100.00%	0.00%	0.00%	12.82%	0.00%	87.18%	0.00%					
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	0	15	10	0	0	20	0	0	2	0	18	0	0	0	0	0	65
PEAK HR FACTOR :	0.00	0.750	0.833	0.000	0.000	0.500	0.000	0.000	0.500	0.000	0.750	0.000	0.000	0.000	0.000	0.000	0.739
	0.893				0.500				0.833								

National Data & Surveying Services **Intersection Turning Movement Count**

Location: S Riverside Ave & I-10 EB Ramps
City: Rialto
Control: Signalized

Project ID: Historical
Date: 4/12/2018

4axle

NS/EW Streets:	S Riverside Ave				S Riverside Ave				I-10 EB Ramps				I-10 EB Ramps				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	2.5	0.5	0	2	2	0	0	1.3	0.3	1.3	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	22	15	0	1	11	0	0	0	0	12	0	0	0	0	0	61
7:15 AM	0	24	11	0	1	10	0	0	0	0	9	0	0	0	0	0	55
7:30 AM	0	10	11	0	0	11	0	0	1	0	22	0	0	0	0	0	55
7:45 AM	0	23	14	0	0	14	0	0	1	0	13	0	0	0	0	0	65
8:00 AM	0	13	17	0	1	20	0	0	1	0	9	0	0	0	0	0	61
8:15 AM	0	24	21	0	2	33	0	0	3	0	17	0	0	0	0	0	100
8:30 AM	0	26	20	0	1	20	0	0	1	0	21	0	0	0	0	0	89
8:45 AM	0	24	18	0	0	14	0	0	2	0	23	0	0	0	0	0	81
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	166	127	0	6	133	0	0	9	0	126	0	0	0	0	0	567
APPROACH %'s :	0.00%	56.66%	43.34%	0.00%	4.32%	95.68%	0.00%	0.00%	6.67%	0.00%	93.33%	0.00%					
PEAK HR :	07:00 AM - 08:00 AM																TOTAL
PEAK HR VOL :	0	79	51	0	2	46	0	0	2	0	56	0	0	0	0	0	236
PEAK HR FACTOR :	0.000	0.823	0.850	0.000	0.500	0.821	0.000	0.000	0.500	0.000	0.636	0.000	0.000	0.000	0.000	0.000	0.908
	0.878				0.857				0.630								

	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
PM	0	2.5	0.5	0	2	2	0	0	1.3	0.3	1.3	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	10	12	0	2	18	0	0	2	0	8	0	0	0	0	0	52
4:15 PM	0	13	14	0	0	20	0	0	3	0	11	0	0	0	0	0	61
4:30 PM	0	8	19	0	1	23	0	0	4	0	10	0	0	0	0	0	65
4:45 PM	0	15	16	0	1	13	0	0	1	0	9	0	0	0	0	0	55
5:00 PM	0	10	16	0	1	15	0	0	1	0	14	0	0	0	0	0	57
5:15 PM	0	12	8	0	1	8	0	0	0	0	11	0	0	0	0	0	40
5:30 PM	0	6	8	0	1	22	0	0	1	0	10	0	0	0	0	0	48
5:45 PM	0	11	13	0	0	21	0	0	0	0	15	0	0	0	0	0	60
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	85	106	0	7	140	0	0	12	0	88	0	0	0	0	0	438
APPROACH %'s :	0.00%	44.50%	55.50%	0.00%	4.76%	95.24%	0.00%	0.00%	12.00%	0.00%	88.00%	0.00%					
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	0	39	45	0	3	66	0	0	2	0	50	0	0	0	0	0	205
PEAK HR FACTOR :	0.00	0.813	0.703	0.000	0.750	0.750	0.000	0.000	0.500	0.000	0.833	0.000	0.000	0.000	0.000	0.000	0.854
	0.808				0.750				0.867								

National Data & Surveying Services Intersection Turning Movement Count

Location: S Riverside Ave & Slover Ave
City: Bloomington
Control: Signalized

Project ID: Historical
Date: 4/12/2018

Total

NS/EW Streets:	S Riverside Ave				S Riverside Ave				Slover Ave				Slover Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	1	2	0	0	1	2	0	0	1	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	17	129	3	0	9	215	110	0	74	6	10	0	4	12	5	0	594
7:15 AM	17	145	7	0	10	246	88	0	47	2	3	0	5	2	5	0	577
7:30 AM	12	177	1	0	4	240	87	0	54	5	14	0	6	4	5	0	609
7:45 AM	15	191	4	1	4	254	90	0	51	5	13	0	4	3	6	0	641
8:00 AM	7	150	1	1	11	258	86	2	54	5	10	0	4	2	4	0	595
8:15 AM	8	161	2	3	16	243	48	0	48	8	11	0	4	4	6	0	562
8:30 AM	9	180	6	0	8	224	52	0	53	9	7	0	6	5	4	0	563
8:45 AM	9	213	3	1	5	196	40	0	48	13	10	0	5	7	3	0	553
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	94	1346	27	6	67	1876	601	2	429	53	78	0	38	39	38	0	4694
APPROACH %'s :	6.38%	91.38%	1.83%	0.41%	2.63%	73.68%	23.61%	0.08%	76.61%	9.46%	13.93%	0.00%	33.04%	33.91%	33.04%	0.00%	
PEAK HR :	07:15 AM - 08:15 AM																TOTAL
PEAK HR VOL :	51	663	13	2	29	998	351	2	206	17	40	0	19	11	20	0	2422
PEAK HR FACTOR :	0.750	0.868	0.464	0.500	0.659	0.967	0.975	0.250	0.954	0.850	0.714	0.000	0.792	0.688	0.833	0.000	0.945
	0.864				0.966				0.901				0.833				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	1	2	0	0	1	2	0	0	1	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	6	273	2	1	5	219	66	0	109	46	28	0	10	2	25	0	792
4:15 PM	7	215	2	1	7	225	64	0	89	47	33	0	5	2	29	0	726
4:30 PM	2	290	4	0	8	239	79	0	84	32	36	0	4	4	25	0	807
4:45 PM	5	230	2	1	5	237	60	0	101	13	27	0	5	3	13	0	702
5:00 PM	2	302	1	3	3	313	44	0	86	38	31	0	2	7	9	0	841
5:15 PM	9	327	2	0	3	294	63	0	95	35	29	0	4	3	20	0	884
5:30 PM	7	261	6	3	2	301	58	0	106	11	25	0	4	1	10	0	795
5:45 PM	4	281	5	0	6	273	61	0	91	23	30	0	5	3	18	0	800
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	42	2179	24	9	39	2101	495	0	761	245	239	0	39	25	149	0	6347
APPROACH %'s :	1.86%	96.67%	1.06%	0.40%	1.48%	79.73%	18.79%	0.00%	61.12%	19.68%	19.20%	0.00%	18.31%	11.74%	69.95%	0.00%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	22	1171	14	6	14	1181	226	0	378	107	115	0	15	14	57	0	3320
PEAK HR FACTOR :	0.611	0.895	0.583	0.500	0.583	0.943	0.897	0.000	0.892	0.704	0.927	0.000	0.750	0.500	0.713	0.000	0.939
	0.897				0.984				0.943				0.796				

National Data & Surveying Services Intersection Turning Movement Count

Location: S Riverside Ave & Slover Ave
City: Bloomington
Control: Signalized

Project ID: Historical
Date: 4/12/2018

Cars

NS/EW Streets:	S Riverside Ave				S Riverside Ave				Slover Ave				Slover Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	1	2	0	0	1	2	0	0	1	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	11	97	2	0	7	181	105	0	69	5	6	0	3	10	4	0	500
7:15 AM	14	95	3	0	7	220	79	0	44	1	1	0	4	2	4	0	474
7:30 AM	10	141	0	0	3	209	79	0	45	5	8	0	4	3	2	0	509
7:45 AM	13	138	3	1	2	218	85	0	50	5	5	0	1	2	4	0	527
8:00 AM	4	113	0	1	6	222	78	2	45	4	6	0	2	1	0	0	484
8:15 AM	6	111	1	3	10	182	45	0	36	7	6	0	2	4	2	0	415
8:30 AM	7	114	3	0	5	178	44	0	39	7	6	0	4	1	1	0	409
8:45 AM	6	149	3	0	4	147	32	0	35	11	5	0	4	5	2	0	403
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	71	958	15	5	44	1557	547	2	363	45	43	0	24	28	19	0	3721
APPROACH %'s :	6.77%	91.33%	1.43%	0.48%	2.05%	72.42%	25.44%	0.09%	80.49%	9.98%	9.53%	0.00%	33.80%	39.44%	26.76%	0.00%	
PEAK HR :	07:15 AM - 08:15 AM																TOTAL
PEAK HR VOL :	41	487	6	2	18	869	321	2	184	15	20	0	11	8	10	0	1994
PEAK HR FACTOR :	0.73	0.863	0.500	0.500	0.643	0.979	0.944	0.250	0.920	0.750	0.625	0.000	0.688	0.667	0.625	0.000	0.946
	0.865				0.982				0.913				0.725				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	1	2	0	0	1	2	0	0	1	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	4	232	0	1	3	185	56	0	103	44	21	0	6	1	23	0	679
4:15 PM	7	186	1	1	2	178	57	0	83	46	25	0	2	2	26	0	616
4:30 PM	1	257	2	0	5	208	63	0	76	28	24	0	2	2	23	0	691
4:45 PM	4	198	1	1	2	215	52	0	97	11	20	0	2	1	10	0	614
5:00 PM	2	277	1	3	0	279	38	0	79	37	25	0	0	1	7	0	749
5:15 PM	6	301	2	0	3	264	59	0	90	33	24	0	1	1	19	0	803
5:30 PM	6	240	4	3	1	261	52	0	102	10	23	0	2	1	8	0	713
5:45 PM	3	248	3	0	1	231	45	0	90	22	25	0	1	1	16	0	686
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	33	1939	14	9	17	1821	422	0	720	231	187	0	16	10	132	0	5551
APPROACH %'s :	1.65%	97.19%	0.70%	0.45%	0.75%	80.58%	18.67%	0.00%	63.27%	20.30%	16.43%	0.00%	10.13%	6.33%	83.54%	0.00%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	17	1066	10	6	5	1035	194	0	361	102	97	0	4	4	50	0	2951
PEAK HR FACTOR :	0.71	0.885	0.625	0.500	0.417	0.927	0.822	0.000	0.885	0.689	0.970	0.000	0.500	1.000	0.658	0.000	0.919
	0.889				0.946				0.952				0.690				

National Data & Surveying Services **Intersection Turning Movement Count**

Location: S Riverside Ave & Slover Ave
City: Bloomington
Control: Signalized

Project ID: Historical
Date: 4/12/2018

2axle

NS/EW Streets:	S Riverside Ave				S Riverside Ave				Slover Ave				Slover Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	1	2	0	0	1	2	0	0	1	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	1	9	0	0	1	5	3	0	2	1	0	0	1	1	0	0	24
7:15 AM	2	10	0	0	1	9	3	0	1	1	1	0	0	0	0	0	28
7:30 AM	0	5	0	0	0	3	4	0	5	0	0	0	1	0	1	0	19
7:45 AM	0	12	1	0	1	10	1	0	0	0	2	0	1	0	1	0	29
8:00 AM	1	6	0	0	1	9	0	0	1	1	0	0	0	0	1	0	20
8:15 AM	1	7	0	0	1	9	2	0	6	1	4	0	0	0	2	0	33
8:30 AM	1	9	0	0	1	8	1	0	7	0	0	0	0	3	1	0	31
8:45 AM	1	24	0	1	1	12	0	0	9	2	1	0	0	2	0	0	53
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	7	82	1	1	7	65	14	0	31	6	8	0	3	6	6	0	237
APPROACH %'s :	7.69%	90.11%	1.10%	1.10%	8.14%	75.58%	16.28%	0.00%	68.89%	13.33%	17.78%	0.00%	20.00%	40.00%	40.00%	0.00%	
PEAK HR :	07:15 AM - 08:15 AM																TOTAL
PEAK HR VOL :	3	33	1	0	3	31	8	0	7	2	3	0	2	0	3	0	96
PEAK HR FACTOR :	0.375	0.688	0.250	0.000	0.750	0.775	0.500	0.000	0.350	0.500	0.375	0.000	0.500	0.000	0.750	0.000	0.828
	0.712				0.808				0.600				0.625				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	1	2	0	0	1	2	0	0	1	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	6	1	0	1	11	4	0	3	0	0	0	0	0	1	0	27
4:15 PM	0	3	0	0	0	13	1	0	1	1	0	0	0	0	2	0	21
4:30 PM	0	8	0	0	0	3	3	0	2	4	4	0	0	0	0	0	24
4:45 PM	0	4	0	0	1	6	0	0	0	0	0	0	0	0	0	0	11
5:00 PM	0	2	0	0	1	6	1	0	3	1	1	0	0	2	0	0	17
5:15 PM	2	4	0	0	0	3	1	0	1	1	0	0	0	0	0	0	12
5:30 PM	0	4	0	0	0	9	1	0	1	0	1	0	0	0	0	0	16
5:45 PM	0	5	0	0	2	5	3	0	1	0	0	0	1	0	1	0	18
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	2	36	1	0	5	56	14	0	12	7	6	0	1	2	4	0	146
APPROACH %'s :	5.13%	92.31%	2.56%	0.00%	6.67%	74.67%	18.67%	0.00%	48.00%	28.00%	24.00%	0.00%	14.29%	28.57%	57.14%	0.00%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	2	15	0	0	3	23	6	0	6	2	2	0	1	2	1	0	63
PEAK HR FACTOR :	0.25	0.750	0.000	0.000	0.375	0.639	0.500	0.000	0.500	0.500	0.500	0.000	0.250	0.250	0.250	0.000	0.875
	0.708				0.800				0.500				0.500				

National Data & Surveying Services Intersection Turning Movement Count

Location: S Riverside Ave & Slover Ave
City: Bloomington
Control: Signalized

Project ID: Historical
Date: 4/12/2018

3axle

NS/EW Streets:	S Riverside Ave				S Riverside Ave				Slover Ave				Slover Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	1	2	0	0	1	2	0	0	1	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	1	5	0	0	1	8	1	0	0	0	1	0	0	0	1	0	18
7:15 AM	1	7	0	0	0	3	0	0	2	0	0	0	0	0	0	0	13
7:30 AM	1	4	1	0	1	1	0	0	2	0	4	0	0	0	1	0	15
7:45 AM	0	6	0	0	1	4	0	0	0	0	3	0	1	1	1	0	17
8:00 AM	0	7	0	0	1	6	1	0	4	0	1	0	1	0	1	0	22
8:15 AM	0	8	0	0	0	5	0	0	1	0	1	0	0	0	1	0	16
8:30 AM	0	8	1	0	0	4	1	0	0	0	1	0	0	1	1	0	17
8:45 AM	0	8	0	0	0	6	3	0	1	0	0	0	0	0	0	0	18
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	3	53	2	0	4	37	6	0	10	0	11	0	2	2	6	0	136
APPROACH %'s :	5.17%	91.38%	3.45%	0.00%	8.51%	78.72%	12.77%	0.00%	47.62%	0.00%	52.38%	0.00%	20.00%	20.00%	60.00%	0.00%	
PEAK HR :	07:15 AM - 08:15 AM																TOTAL
PEAK HR VOL :	2	24	1	0	3	14	1	0	8	0	8	0	2	1	3	0	67
PEAK HR FACTOR :	0.500	0.857	0.250	0.000	0.750	0.583	0.250	0.000	0.500	0.000	0.500	0.000	0.500	0.250	0.750	0.000	0.761
	0.844				0.563				0.667				0.500				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	1	2	0	0	1	2	0	0	1	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	1	8	0	0	1	2	2	0	1	2	2	0	1	0	1	0	21
4:15 PM	0	6	0	0	0	11	2	0	3	0	4	0	0	0	0	0	26
4:30 PM	1	8	1	0	3	5	3	0	0	0	3	0	0	1	2	0	27
4:45 PM	1	5	0	0	0	2	0	0	1	0	4	0	2	1	1	0	17
5:00 PM	0	3	0	0	0	6	1	0	2	0	1	0	1	0	0	0	14
5:15 PM	1	7	0	0	0	9	0	0	2	0	3	0	0	1	0	0	23
5:30 PM	0	4	1	0	0	6	0	0	1	0	0	0	1	0	0	0	13
5:45 PM	0	5	0	0	2	10	5	0	0	0	1	0	2	1	0	0	26
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	4	46	2	0	6	51	13	0	10	2	18	0	7	4	4	0	167
APPROACH %'s :	7.69%	88.46%	3.85%	0.00%	8.57%	72.86%	18.57%	0.00%	33.33%	6.67%	60.00%	0.00%	46.67%	26.67%	26.67%	0.00%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	1	19	1	0	2	31	6	0	5	0	5	0	4	2	0	0	76
PEAK HR FACTOR :	0.25	0.679	0.250	0.000	0.250	0.775	0.300	0.000	0.625	0.000	0.417	0.000	0.500	0.500	0.000	0.000	0.731
	0.656				0.574				0.500				0.500				

National Data & Surveying Services Intersection Turning Movement Count

Location: S Riverside Ave & Slover Ave
City: Bloomington
Control: Signalized

Project ID: Historical
Date: 4/12/2018

4axle

NS/EW Streets:	S Riverside Ave				S Riverside Ave				Slover Ave				Slover Ave				
	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
AM	1	2	0	0	1	2	0	0	1	2	0	0	1	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	4	18	1	0	0	21	1	0	3	0	3	0	0	1	0	0	52
7:15 AM	0	33	4	0	2	14	6	0	0	0	1	0	1	0	1	0	62
7:30 AM	1	27	0	0	0	27	4	0	2	0	2	0	1	1	1	0	66
7:45 AM	2	35	0	0	0	22	4	0	1	0	3	0	1	0	0	0	68
8:00 AM	2	24	1	0	3	21	7	0	4	0	3	0	1	1	2	0	69
8:15 AM	1	35	1	0	5	47	1	0	5	0	0	0	2	0	1	0	98
8:30 AM	1	49	2	0	2	34	6	0	7	2	0	0	2	0	1	0	106
8:45 AM	2	32	0	0	0	31	5	0	3	0	4	0	1	0	1	0	79
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	13	253	9	0	12	217	34	0	25	2	16	0	9	3	7	0	600
APPROACH %'s :	4.73%	92.00%	3.27%	0.00%	4.56%	82.51%	12.93%	0.00%	58.14%	4.65%	37.21%	0.00%	47.37%	15.79%	36.84%	0.00%	
PEAK HR :	07:15 AM - 08:15 AM																TOTAL
PEAK HR VOL :	5	119	5	0	5	84	21	0	7	0	9	0	4	2	4	0	265
PEAK HR FACTOR :	0.625	0.850	0.313	0.000	0.417	0.778	0.750	0.000	0.438	0.000	0.750	0.000	1.000	0.500	0.500	0.000	0.960
	0.872				0.887				0.571				0.625				

	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
PM	1	2	0	0	1	2	0	0	1	2	0	0	1	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	1	27	1	0	0	21	4	0	2	0	5	0	3	1	0	0	65
4:15 PM	0	20	1	0	5	23	4	0	2	0	4	0	3	0	1	0	63
4:30 PM	0	17	1	0	0	23	10	0	6	0	5	0	2	1	0	0	65
4:45 PM	0	23	1	0	2	14	8	0	3	2	3	0	1	1	2	0	60
5:00 PM	0	20	0	0	2	22	4	0	2	0	4	0	1	4	2	0	61
5:15 PM	0	15	0	0	0	18	3	0	2	1	2	0	3	1	1	0	46
5:30 PM	1	13	1	0	1	25	5	0	2	1	1	0	1	0	2	0	53
5:45 PM	1	23	2	0	1	27	8	0	0	1	4	0	1	1	1	0	70
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	3	158	7	0	11	173	46	0	19	5	28	0	15	9	9	0	483
APPROACH %'s :	1.79%	94.05%	4.17%	0.00%	4.78%	75.22%	20.00%	0.00%	36.54%	9.62%	53.85%	0.00%	45.45%	27.27%	27.27%	0.00%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	2	71	3	0	4	92	20	0	6	3	11	0	6	6	6	0	230
PEAK HR FACTOR :	0.50	0.772	0.375	0.000	0.500	0.852	0.625	0.000	0.750	0.750	0.688	0.000	0.500	0.375	0.750	0.000	0.821
	0.731				0.806				0.833				0.643				

National Data & Surveying Services **Intersection Turning Movement Count**

Location: S Riverside Ave & Santa Ana Ave
City: Bloomington
Control: Signalized

Project ID: Historical
Date: 4/12/2018

Total

NS/EW Streets:	S Riverside Ave				S Riverside Ave				Santa Ana Ave				Santa Ana Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	3	0	0	0	3	0	0	0	1	0	0	0	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	24	160	3	0	13	196	23	0	7	7	14	0	4	3	10	0	464
7:15 AM	15	146	4	1	8	217	31	0	10	8	11	0	4	5	7	0	467
7:30 AM	14	185	1	0	4	222	23	0	14	7	9	0	2	3	7	0	491
7:45 AM	21	178	7	0	11	234	25	0	17	4	13	0	5	6	9	0	530
8:00 AM	13	154	6	0	2	231	26	0	13	2	16	0	2	2	7	0	474
8:15 AM	8	149	11	0	17	225	21	0	19	1	10	0	7	1	4	0	473
8:30 AM	12	162	7	0	19	193	18	1	15	1	9	0	8	4	12	0	461
8:45 AM	9	202	8	0	23	182	15	0	25	5	13	0	9	1	8	0	500
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	116	1336	47	1	97	1700	182	1	120	35	95	0	41	25	64	0	3860
APPROACH %'s :	7.73%	89.07%	3.13%	0.07%	4.90%	85.86%	9.19%	0.05%	48.00%	14.00%	38.00%	0.00%	31.54%	19.23%	49.23%	0.00%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	56	666	25	0	34	912	95	0	63	14	48	0	16	12	27	0	1968
PEAK HR FACTOR :	0.667	0.900	0.568	0.000	0.500	0.974	0.913	0.000	0.829	0.500	0.750	0.000	0.571	0.500	0.750	0.000	0.928
	0.907				0.964				0.919				0.688				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	3	0	0	0	3	0	0	0	1	0	0	0	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	16	244	6	0	9	234	18	0	19	6	26	0	10	6	11	0	605
4:15 PM	19	220	5	0	12	248	10	0	16	3	19	0	5	2	17	0	576
4:30 PM	21	202	6	0	7	261	13	0	18	1	18	0	12	1	15	0	575
4:45 PM	9	224	9	0	7	238	19	1	11	1	12	0	5	2	9	0	547
5:00 PM	22	274	4	0	5	296	19	0	24	5	21	0	7	3	23	0	703
5:15 PM	15	271	1	0	9	340	15	0	24	2	25	0	9	2	12	0	725
5:30 PM	18	269	3	0	7	309	15	0	23	2	15	0	7	5	10	0	683
5:45 PM	15	235	1	0	9	277	19	0	16	1	12	0	3	4	7	0	599
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	135	1939	35	0	65	2203	128	1	151	21	148	0	58	25	104	0	5013
APPROACH %'s :	6.40%	91.94%	1.66%	0.00%	2.71%	91.91%	5.34%	0.04%	47.19%	6.56%	46.25%	0.00%	31.02%	13.37%	55.61%	0.00%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	70	1049	9	0	30	1222	68	0	87	10	73	0	26	14	52	0	2710
PEAK HR FACTOR :	0.795	0.957	0.563	0.000	0.833	0.899	0.895	0.000	0.906	0.500	0.730	0.000	0.722	0.700	0.565	0.000	0.934
	0.940				0.907				0.833				0.697				

National Data & Surveying Services **Intersection Turning Movement Count**

Location: S Riverside Ave & Santa Ana Ave
City: Bloomington
Control: Signalized

Project ID: Historical
Date: 4/12/2018

Cars

NS/EW Streets:	S Riverside Ave				S Riverside Ave				Santa Ana Ave				Santa Ana Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	3	0	0	0	3	0	0	0	1	0	0	0	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	23	125	1	0	8	166	19	0	4	1	13	0	0	0	2	0	362
7:15 AM	14	109	2	1	7	189	29	0	8	2	9	0	1	2	0	0	373
7:30 AM	10	152	0	0	0	193	22	0	13	0	8	0	1	0	1	0	400
7:45 AM	18	137	3	0	7	201	18	0	12	0	11	0	1	0	1	0	409
8:00 AM	10	117	4	0	0	200	24	0	9	2	11	0	0	0	1	0	378
8:15 AM	6	111	2	0	5	172	17	0	14	1	9	0	2	0	2	0	341
8:30 AM	10	111	2	0	6	160	15	1	11	1	7	0	0	4	4	0	332
8:45 AM	8	159	3	0	11	139	14	0	9	3	10	0	2	1	1	0	360
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	99	1021	17	1	44	1420	158	1	80	10	78	0	7	7	12	0	2955
APPROACH %'s :	8.70%	89.72%	1.49%	0.09%	2.71%	87.49%	9.74%	0.06%	47.62%	5.95%	46.43%	0.00%	26.92%	26.92%	46.15%	0.00%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	44	517	9	0	12	766	81	0	48	3	39	0	4	0	5	0	1528
PEAK HR FACTOR :	0.61	0.850	0.563	0.000	0.429	0.953	0.844	0.000	0.857	0.375	0.886	0.000	0.500	0.000	0.625	0.000	0.934
	0.880				0.950				0.938				0.563				

	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
PM	0	3	0	0	0	3	0	0	0	1	0	0	0	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	15	214	5	0	4	199	15	0	16	6	19	0	7	4	7	0	511
4:15 PM	17	195	3	0	8	203	10	0	16	3	17	0	5	2	16	0	495
4:30 PM	19	182	5	0	5	220	10	0	15	1	17	0	9	1	13	0	497
4:45 PM	6	198	4	0	5	207	18	1	6	0	11	0	3	1	7	0	467
5:00 PM	20	254	3	0	2	265	16	0	21	4	18	0	6	3	21	0	633
5:15 PM	15	246	1	0	5	306	14	0	22	1	22	0	8	1	10	0	651
5:30 PM	15	247	0	0	4	273	13	0	21	1	12	0	3	3	8	0	600
5:45 PM	13	205	0	0	3	232	18	0	14	1	11	0	1	4	7	0	509
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	120	1741	21	0	36	1905	114	1	131	17	127	0	42	19	89	0	4363
APPROACH %'s :	6.38%	92.51%	1.12%	0.00%	1.75%	92.66%	5.54%	0.05%	47.64%	6.18%	46.18%	0.00%	28.00%	12.67%	59.33%	0.00%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	63	952	4	0	14	1076	61	0	78	7	63	0	18	11	46	0	2393
PEAK HR FACTOR :	0.79	0.937	0.333	0.000	0.700	0.879	0.847	0.000	0.886	0.438	0.716	0.000	0.563	0.688	0.548	0.000	0.919
	0.920				0.885				0.822				0.625				

National Data & Surveying Services Intersection Turning Movement Count

Location: S Riverside Ave & Santa Ana Ave
City: Bloomington
Control: Signalized

Project ID: Historical
Date: 4/12/2018

2axle

NS/EW Streets:	S Riverside Ave				S Riverside Ave				Santa Ana Ave				Santa Ana Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	3	0	0	0	3	0	0	0	1	0	0	0	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	10	0	0	0	8	1	0	1	0	0	0	0	0	1	0	21
7:15 AM	0	7	0	0	0	12	0	0	0	1	0	0	0	0	1	0	21
7:30 AM	4	8	0	0	1	5	0	0	0	1	0	0	0	0	0	0	19
7:45 AM	2	6	0	0	1	7	3	0	3	0	0	0	0	0	2	0	24
8:00 AM	1	5	0	0	0	7	1	0	1	0	2	0	0	0	0	0	17
8:15 AM	1	5	0	0	0	13	2	0	2	0	0	0	0	0	1	0	24
8:30 AM	1	7	0	0	0	7	0	0	4	0	0	0	0	0	0	0	19
8:45 AM	0	13	1	0	1	13	0	0	13	0	0	0	0	0	1	0	42
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	9	61	1	0	3	72	7	0	24	2	2	0	0	0	6	0	187
APPROACH %'s :	12.68%	85.92%	1.41%	0.00%	3.66%	87.80%	8.54%	0.00%	85.71%	7.14%	7.14%	0.00%	0.00%	0.00%	100.00%	0.00%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	8	24	0	0	2	32	6	0	6	1	2	0	0	0	3	0	84
PEAK HR FACTOR :	0.500	0.750	0.000	0.000	0.500	0.615	0.500	0.000	0.500	0.250	0.250	0.000	0.000	0.000	0.375	0.000	0.875
	0.667				0.667				0.750				0.375				

	S Riverside Ave				S Riverside Ave				Santa Ana Ave				Santa Ana Ave				
PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	3	0	0	0	3	0	0	0	1	0	0	0	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	1	2	0	0	0	7	2	0	1	0	1	0	1	0	2	0	17
4:15 PM	0	2	0	0	0	11	0	0	0	0	0	0	0	0	0	0	13
4:30 PM	1	4	0	0	0	3	2	0	0	0	1	0	1	0	0	0	12
4:45 PM	0	4	0	0	1	6	1	0	0	0	0	0	0	0	0	0	12
5:00 PM	1	2	0	0	2	2	1	0	0	0	0	0	0	0	0	0	8
5:15 PM	0	3	0	0	1	6	1	0	0	0	0	0	0	0	1	0	12
5:30 PM	0	4	0	0	0	6	2	0	0	0	0	0	0	1	0	0	13
5:45 PM	0	5	0	0	0	7	0	0	0	0	0	0	0	0	0	0	12
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	3	26	0	0	4	48	9	0	1	0	2	0	2	1	3	0	99
APPROACH %'s :	10.34%	89.66%	0.00%	0.00%	6.56%	78.69%	14.75%	0.00%	33.33%	0.00%	66.67%	0.00%	33.33%	16.67%	50.00%	0.00%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	1	14	0	0	3	21	4	0	0	0	0	0	0	1	1	0	45
PEAK HR FACTOR :	0.25	0.700	0.000	0.000	0.375	0.750	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.250	0.000	0.865
	0.750				0.875								0.500				

National Data & Surveying Services Intersection Turning Movement Count

Location: S Riverside Ave & Santa Ana Ave
City: Bloomington
Control: Signalized

Project ID: Historical
Date: 4/12/2018

3axle

NS/EW Streets:	S Riverside Ave				S Riverside Ave				Santa Ana Ave				Santa Ana Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	3	0	0	0	3	0	0	0	1	0	0	0	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	1	2	1	0	1	3	1	0	0	5	0	0	2	0	2	0	18
7:15 AM	0	6	0	0	0	3	1	0	1	5	0	0	1	1	2	0	20
7:30 AM	0	7	0	0	0	2	0	0	0	4	0	0	1	0	0	0	14
7:45 AM	1	5	1	0	0	7	0	0	1	4	1	0	2	0	0	0	22
8:00 AM	0	8	1	0	1	5	0	0	1	0	2	0	0	0	1	0	19
8:15 AM	1	5	1	0	2	13	1	0	0	0	0	0	1	0	0	0	24
8:30 AM	0	6	1	0	2	5	1	0	0	0	1	0	1	0	1	0	18
8:45 AM	0	7	1	0	0	7	0	0	0	1	0	0	1	0	1	0	18
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	3	46	6	0	6	45	4	0	3	19	4	0	9	1	7	0	153
APPROACH %'s :	5.45%	83.64%	10.91%	0.00%	10.91%	81.82%	7.27%	0.00%	11.54%	73.08%	15.38%	0.00%	52.94%	5.88%	41.18%	0.00%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	2	25	3	0	3	27	1	0	2	8	3	0	4	0	1	0	79
PEAK HR FACTOR :	0.500	0.781	0.750	0.000	0.375	0.519	0.250	0.000	0.500	0.500	0.375	0.000	0.500	0.000	0.250	0.000	0.823
	0.833				0.484				0.542				0.625				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	3	0	0	0	3	0	0	0	1	0	0	0	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	5	0	0	1	6	0	0	0	0	1	0	1	1	1	0	16
4:15 PM	1	5	0	0	3	12	0	0	0	0	1	0	0	0	0	0	22
4:30 PM	0	4	0	0	1	6	0	0	0	0	0	0	1	0	0	0	12
4:45 PM	3	6	2	0	0	5	0	0	2	1	1	0	1	1	0	0	22
5:00 PM	0	5	1	0	1	10	0	0	0	1	1	0	1	0	0	0	20
5:15 PM	0	7	0	0	1	9	0	0	0	0	2	0	0	0	1	0	20
5:30 PM	1	4	0	0	2	6	0	0	0	1	0	0	3	1	0	0	18
5:45 PM	0	4	0	0	1	10	1	0	2	0	0	0	1	0	0	0	19
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	5	40	3	0	10	64	1	0	4	3	6	0	8	3	2	0	149
APPROACH %'s :	10.42%	83.33%	6.25%	0.00%	13.33%	85.33%	1.33%	0.00%	30.77%	23.08%	46.15%	0.00%	61.54%	23.08%	15.38%	0.00%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	1	20	1	0	5	35	1	0	2	2	3	0	5	1	1	0	77
PEAK HR FACTOR :	0.25	0.714	0.250	0.000	0.625	0.875	0.250	0.000	0.250	0.500	0.375	0.000	0.417	0.250	0.250	0.000	0.963
	0.786				0.854				0.875				0.438				

National Data & Surveying Services **Intersection Turning Movement Count**

Location: S Riverside Ave & Santa Ana Ave
City: Bloomington
Control: Signalized

Project ID: Historical
Date: 4/12/2018

4axle

NS/EW Streets:	S Riverside Ave				S Riverside Ave				Santa Ana Ave				Santa Ana Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	3	0	0	0	3	0	0	0	1	0	0	0	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	23	1	0	4	19	2	0	2	1	1	0	2	3	5	0	63
7:15 AM	1	24	2	0	1	13	1	0	1	0	2	0	2	2	4	0	53
7:30 AM	0	18	1	0	3	22	1	0	1	2	1	0	0	3	6	0	58
7:45 AM	0	30	3	0	3	19	4	0	1	0	1	0	2	6	6	0	75
8:00 AM	2	24	1	0	1	19	1	0	2	0	1	0	2	2	5	0	60
8:15 AM	0	28	8	0	10	27	1	0	3	0	1	0	4	1	1	0	84
8:30 AM	1	38	4	0	11	21	2	0	0	0	1	0	7	0	7	0	92
8:45 AM	1	23	3	0	11	23	1	0	3	1	3	0	6	0	5	0	80
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	5	208	23	0	44	163	13	0	13	4	11	0	25	17	39	0	565
APPROACH %'s :	2.12%	88.14%	9.75%	0.00%	20.00%	74.09%	5.91%	0.00%	46.43%	14.29%	39.29%	0.00%	30.86%	20.99%	48.15%	0.00%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	2	100	13	0	17	87	7	0	7	2	4	0	8	12	18	0	277
PEAK HR FACTOR :	0.250	0.833	0.406	0.000	0.425	0.806	0.438	0.000	0.583	0.250	1.000	0.000	0.500	0.500	0.750	0.000	0.824
	0.799				0.730				0.813				0.679				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	3	0	0	0	3	0	0	0	1	0	0	0	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	23	1	0	4	22	1	0	2	0	5	0	1	1	1	0	61
4:15 PM	1	18	2	0	1	22	0	0	0	0	1	0	0	0	1	0	46
4:30 PM	1	12	1	0	1	32	1	0	3	0	0	0	1	0	2	0	54
4:45 PM	0	16	3	0	1	20	0	0	3	0	0	0	1	0	2	0	46
5:00 PM	1	13	0	0	0	19	2	0	3	0	2	0	0	0	2	0	42
5:15 PM	0	15	0	0	2	19	0	0	2	1	1	0	1	1	0	0	42
5:30 PM	2	14	3	0	1	24	0	0	2	0	3	0	1	0	2	0	52
5:45 PM	2	21	1	0	5	28	0	0	0	0	1	0	1	0	0	0	59
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	7	132	11	0	15	186	4	0	15	1	13	0	6	2	10	0	402
APPROACH %'s :	4.67%	88.00%	7.33%	0.00%	7.32%	90.73%	1.95%	0.00%	51.72%	3.45%	44.83%	0.00%	33.33%	11.11%	55.56%	0.00%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	5	63	4	0	8	90	2	0	7	1	7	0	3	1	4	0	195
PEAK HR FACTOR :	0.63	0.750	0.333	0.000	0.400	0.804	0.250	0.000	0.583	0.250	0.583	0.000	0.750	0.250	0.500	0.000	0.826
	0.750				0.758				0.750				0.667				

National Data & Surveying Services Intersection Turning Movement Count

Location: S Riverside Ave & Industrial Dr
City: Bloomington
Control: 1-Way Stop (WB)

Project ID: Historical
Date: 4/12/2018

Total

NS/EW Streets:	S Riverside Ave				S Riverside Ave				Industrial Dr				Industrial Dr				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	2	0	0	0	2	0	0	0	0	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	174	0	0	8	189	0	0	0	0	0	0	0	0	8	0	379
7:15 AM	0	160	2	0	5	226	0	0	0	0	0	0	0	0	2	0	395
7:30 AM	0	201	2	0	6	233	0	0	0	0	0	0	0	0	3	0	445
7:45 AM	0	194	1	0	6	232	0	0	0	0	0	0	0	0	4	0	437
8:00 AM	0	177	0	0	9	217	0	0	0	0	0	0	0	0	7	0	410
8:15 AM	0	143	0	0	13	236	0	0	0	0	0	0	1	0	11	0	404
8:30 AM	0	173	0	0	10	187	0	0	0	0	0	0	1	0	7	0	378
8:45 AM	0	217	2	0	6	181	0	0	0	0	0	0	1	0	6	0	413
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	1439	7	0	63	1701	0	0	0	0	0	0	3	0	48	0	3261
APPROACH %'s :	0.00%	99.52%	0.48%	0.00%	3.57%	96.43%	0.00%	0.00%					5.88%	0.00%	94.12%	0.00%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	0	715	3	0	34	918	0	0	0	0	0	0	1	0	25	0	1696
PEAK HR FACTOR :	0.000	0.889	0.375	0.000	0.654	0.972	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.568	0.000	0.953
	0.884				0.956								0.542				

	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
PM	0	2	0	0	0	2	0	0	0	0	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	250	1	0	8	254	0	0	0	0	0	0	1	0	6	0	520
4:15 PM	0	231	2	0	7	274	0	0	0	0	0	0	0	0	11	0	525
4:30 PM	0	204	2	0	5	268	0	0	0	0	0	0	0	0	18	0	497
4:45 PM	0	239	0	0	3	278	0	0	0	0	0	0	2	0	6	0	528
5:00 PM	0	266	0	0	3	309	0	1	0	0	0	0	1	0	10	0	590
5:15 PM	0	271	2	0	5	379	0	0	0	0	0	0	2	0	2	0	661
5:30 PM	0	273	2	0	7	335	0	0	0	0	0	0	0	0	3	0	620
5:45 PM	0	237	3	0	3	305	0	0	0	0	0	0	0	0	7	0	555
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	1971	12	0	41	2402	0	1	0	0	0	0	6	0	63	0	4496
APPROACH %'s :	0.00%	99.39%	0.61%	0.00%	1.68%	98.28%	0.00%	0.04%					8.70%	0.00%	91.30%	0.00%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	0	1047	7	0	18	1328	0	1	0	0	0	0	3	0	22	0	2426
PEAK HR FACTOR :	0.000	0.959	0.583	0.000	0.643	0.876	0.000	0.250	0.000	0.000	0.000	0.000	0.375	0.000	0.550	0.000	0.918
	0.958				0.877								0.568				

National Data & Surveying Services Intersection Turning Movement Count

Location: S Riverside Ave & Industrial Dr
City: Bloomington
Control: 1-Way Stop (WB)

Project ID: Historical
Date: 4/12/2018

Cars

NS/EW Streets:	S Riverside Ave				S Riverside Ave				Industrial Dr				Industrial Dr				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	2	0	0	0	2	0	0	0	0	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	139	0	0	5	155	0	0	0	0	0	0	0	0	4	0	303
7:15 AM	0	125	1	0	4	196	0	0	0	0	0	0	0	0	0	0	326
7:30 AM	0	169	2	0	4	202	0	0	0	0	0	0	0	0	1	0	378
7:45 AM	0	149	1	0	3	200	0	0	0	0	0	0	0	0	2	0	355
8:00 AM	0	137	0	0	5	186	0	0	0	0	0	0	0	0	4	0	332
8:15 AM	0	99	0	0	8	185	0	0	0	0	0	0	1	0	5	0	298
8:30 AM	0	117	0	0	4	146	0	0	0	0	0	0	0	0	4	0	271
8:45 AM	0	172	1	0	3	135	0	0	0	0	0	0	0	0	0	0	311
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	1107	5	0	36	1405	0	0	0	0	0	0	1	0	20	0	2574
APPROACH %'s :	0.00%	99.55%	0.45%	0.00%	2.50%	97.50%	0.00%	0.00%					4.76%	0.00%	95.24%	0.00%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	0	554	3	0	20	773	0	0	0	0	0	0	1	0	12	0	1363
PEAK HR FACTOR :	0.00	0.820	0.375	0.000	0.625	0.957	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.600	0.000	0.901
	0.814				0.962								0.542				

	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
PM	0	2	0	0	0	2	0	0	0	0	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	227	0	0	4	216	0	0	0	0	0	0	1	0	3	0	451
4:15 PM	0	200	2	0	1	224	0	0	0	0	0	0	0	0	8	0	435
4:30 PM	0	184	2	0	2	235	0	0	0	0	0	0	0	0	16	0	439
4:45 PM	0	210	0	0	0	244	0	0	0	0	0	0	2	0	3	0	459
5:00 PM	0	246	0	0	2	275	0	1	0	0	0	0	1	0	10	0	535
5:15 PM	0	248	2	0	3	340	0	0	0	0	0	0	2	0	0	0	595
5:30 PM	0	248	2	0	2	298	0	0	0	0	0	0	0	0	2	0	552
5:45 PM	0	207	2	0	2	261	0	0	0	0	0	0	0	0	2	0	474
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	1770	10	0	16	2093	0	1	0	0	0	0	6	0	44	0	3940
APPROACH %'s :	0.00%	99.44%	0.56%	0.00%	0.76%	99.19%	0.00%	0.05%					12.00%	0.00%	88.00%	0.00%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	0	949	6	0	9	1174	0	1	0	0	0	0	3	0	14	0	2156
PEAK HR FACTOR :	0.00	0.957	0.750	0.000	0.750	0.863	0.000	0.250	0.000	0.000	0.000	0.000	0.375	0.000	0.350	0.000	0.906
	0.955				0.863								0.386				

National Data & Surveying Services **Intersection Turning Movement Count**

Location: S Riverside Ave & Industrial Dr
City: Bloomington
Control: 1-Way Stop (WB)

Project ID: Historical
Date: 4/12/2018

2axle

NS/EW Streets:	S Riverside Ave				S Riverside Ave				Industrial Dr				Industrial Dr				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	2	0	0	0	2	0	0	0	0	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	8	0	0	0	7	0	0	0	0	0	0	0	0	0	0	15
7:15 AM	0	7	0	0	0	9	0	0	0	0	0	0	0	0	0	0	16
7:30 AM	0	9	0	0	0	6	0	0	0	0	0	0	0	0	0	0	15
7:45 AM	0	8	0	0	0	7	0	0	0	0	0	0	0	0	0	0	15
8:00 AM	0	6	0	0	0	6	0	0	0	0	0	0	0	0	0	0	12
8:15 AM	0	7	0	0	0	9	0	0	0	0	0	0	0	0	0	0	16
8:30 AM	0	7	0	0	0	7	0	0	0	0	0	0	0	0	0	0	14
8:45 AM	0	11	1	0	1	10	0	0	0	0	0	0	0	0	1	0	24
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	63	1	0	1	61	0	0	0	0	0	0	0	0	1	0	127
APPROACH %'s :	0.00%	98.44%	1.56%	0.00%	1.61%	98.39%	0.00%	0.00%					0.00%	0.00%	100.00%	0.00%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	0	30	0	0	0	28	0	0	0	0	0	0	0	0	0	0	58
PEAK HR FACTOR :	0.000	0.833	0.000	0.000	0.000	0.778	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.906
	0.833				0.778												

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	2	0	0	0	2	0	0	0	0	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	3	0	0	1	8	0	0	0	0	0	0	0	0	0	0	12
4:15 PM	0	5	0	0	0	13	0	0	0	0	0	0	0	0	0	0	18
4:30 PM	0	6	0	0	1	4	0	0	0	0	0	0	0	0	0	0	11
4:45 PM	0	3	0	0	0	7	0	0	0	0	0	0	0	0	0	0	10
5:00 PM	0	4	0	0	0	3	0	0	0	0	0	0	0	0	0	0	7
5:15 PM	0	4	0	0	0	7	0	0	0	0	0	0	0	0	0	0	11
5:30 PM	0	4	0	0	0	5	0	0	0	0	0	0	0	0	0	0	9
5:45 PM	0	5	0	0	0	6	0	0	0	0	0	0	0	0	0	0	11
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	34	0	0	2	53	0	0	0	0	0	0	0	0	0	0	89
APPROACH %'s :	0.00%	100.00%	0.00%	0.00%	3.64%	96.36%	0.00%	0.00%									
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	0	17	0	0	0	21	0	0	0	0	0	0	0	0	0	0	38
PEAK HR FACTOR :	0.00	0.850	0.000	0.000	0.000	0.750	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.864
	0.850				0.750												

National Data & Surveying Services Intersection Turning Movement Count

Location: S Riverside Ave & Industrial Dr
City: Bloomington
Control: 1-Way Stop (WB)

Project ID: Historical
Date: 4/12/2018

3axle

NS/EW Streets:	S Riverside Ave				S Riverside Ave				Industrial Dr				Industrial Dr				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	2	0	0	0	2	0	0	0	0	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	4	0	0	0	4	0	0	0	0	0	0	0	0	2	0	10
7:15 AM	0	6	0	0	0	6	0	0	0	0	0	0	0	0	0	0	12
7:30 AM	0	8	0	0	1	4	0	0	0	0	0	0	0	0	1	0	14
7:45 AM	0	6	0	0	0	8	0	0	0	0	0	0	0	0	0	0	14
8:00 AM	0	9	0	0	3	5	0	0	0	0	0	0	0	0	1	0	18
8:15 AM	0	4	0	0	0	13	0	0	0	0	0	0	0	0	2	0	19
8:30 AM	0	7	0	0	1	6	0	0	0	0	0	0	0	0	0	0	14
8:45 AM	0	8	0	0	0	6	0	0	0	0	0	0	0	0	1	0	15
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	52	0	0	5	52	0	0	0	0	0	0	0	0	7	0	116
APPROACH %'s :	0.00%	100.00%	0.00%	0.00%	8.77%	91.23%	0.00%	0.00%					0.00%	0.00%	100.00%	0.00%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	0	27	0	0	4	30	0	0	0	0	0	0	0	0	4	0	65
PEAK HR FACTOR :	0.000	0.750	0.000	0.000	0.333	0.577	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.500	0.000	0.855
	0.750				0.654								0.500				

	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
PM	0	2	0	0	0	2	0	0	0	0	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	3	0	0	0	7	0	0	0	0	0	0	0	0	1	0	11
4:15 PM	0	7	0	0	1	13	0	0	0	0	0	0	0	0	1	0	22
4:30 PM	0	3	0	0	0	5	0	0	0	0	0	0	0	0	0	0	8
4:45 PM	0	7	0	0	2	6	0	0	0	0	0	0	0	0	2	0	17
5:00 PM	0	5	0	0	0	11	0	0	0	0	0	0	0	0	0	0	16
5:15 PM	0	6	0	0	0	11	0	0	0	0	0	0	0	0	1	0	18
5:30 PM	0	4	0	0	1	9	0	0	0	0	0	0	0	0	1	0	15
5:45 PM	0	4	0	0	1	8	0	0	0	0	0	0	0	0	2	0	15
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	39	0	0	5	70	0	0	0	0	0	0	0	0	8	0	122
APPROACH %'s :	0.00%	100.00%	0.00%	0.00%	6.67%	93.33%	0.00%	0.00%					0.00%	0.00%	100.00%	0.00%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	0	19	0	0	2	39	0	0	0	0	0	0	0	0	4	0	64
PEAK HR FACTOR :	0.00	0.792	0.000	0.000	0.500	0.886	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.500	0.000	0.889
	0.792				0.932								0.500				

National Data & Surveying Services Intersection Turning Movement Count

Location: S Riverside Ave & Industrial Dr
City: Bloomington
Control: 1-Way Stop (WB)

Project ID: Historical
Date: 4/12/2018

4axle

NS/EW Streets:	S Riverside Ave				S Riverside Ave				Industrial Dr				Industrial Dr				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	2	0	0	0	2	0	0	0	0	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	23	0	0	3	23	0	0	0	0	0	0	0	0	2	0	51
7:15 AM	0	22	1	0	1	15	0	0	0	0	0	0	0	0	2	0	41
7:30 AM	0	15	0	0	1	21	0	0	0	0	0	0	0	0	1	0	38
7:45 AM	0	31	0	0	3	17	0	0	0	0	0	0	0	0	2	0	53
8:00 AM	0	25	0	0	1	20	0	0	0	0	0	0	0	0	2	0	48
8:15 AM	0	33	0	0	5	29	0	0	0	0	0	0	0	0	4	0	71
8:30 AM	0	42	0	0	5	28	0	0	0	0	0	0	1	0	3	0	79
8:45 AM	0	26	0	0	2	30	0	0	0	0	0	0	1	0	4	0	63
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	217	1	0	21	183	0	0	0	0	0	0	2	0	20	0	444
APPROACH %'s :	0.00%	99.54%	0.46%	0.00%	10.29%	89.71%	0.00%	0.00%					9.09%	0.00%	90.91%	0.00%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	0	104	0	0	10	87	0	0	0	0	0	0	0	0	9	0	210
PEAK HR FACTOR :	0.000	0.788	0.000	0.000	0.500	0.750	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.563	0.000	0.739
	0.788				0.713								0.563				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	2	0	0	0	2	0	0	0	0	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	17	1	0	3	23	0	0	0	0	0	0	0	0	2	0	46
4:15 PM	0	19	0	0	5	24	0	0	0	0	0	0	0	0	2	0	50
4:30 PM	0	11	0	0	2	24	0	0	0	0	0	0	0	0	2	0	39
4:45 PM	0	19	0	0	1	21	0	0	0	0	0	0	0	0	1	0	42
5:00 PM	0	11	0	0	1	20	0	0	0	0	0	0	0	0	0	0	32
5:15 PM	0	13	0	0	2	21	0	0	0	0	0	0	0	0	1	0	37
5:30 PM	0	17	0	0	4	23	0	0	0	0	0	0	0	0	0	0	44
5:45 PM	0	21	1	0	0	30	0	0	0	0	0	0	0	0	3	0	55
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	128	2	0	18	186	0	0	0	0	0	0	0	0	11	0	345
APPROACH %'s :	0.00%	98.46%	1.54%	0.00%	8.82%	91.18%	0.00%	0.00%					0.00%	0.00%	100.00%	0.00%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	0	62	1	0	7	94	0	0	0	0	0	0	0	0	4	0	168
PEAK HR FACTOR :	0.00	0.738	0.250	0.000	0.438	0.783	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.333	0.000	0.764
	0.716				0.842								0.333				

Prepared by National Data & Surveying Services

S Riverside Ave & S Jurupa Ave

Peak Hour Turning Movement Count

ID: 18-06047-007
City: Bloomington

Day: Thursday
Date: 04/12/2018

PEAK HOURS		COUNT PERIODS
07:15 AM - 08:15 AM	AM	07:00 AM - 09:00 AM
NONE	NOON	NONE
05:00 PM - 06:00 PM	PM	04:00 PM - 06:00 PM

S Riverside Ave – SOUTHBOUND

	Right	Thru	Left	U-Turn	Exit (to north)
AM	44	879	0	0	736
NOON	0	0	0	0	0
PM	39	1290	0	0	1052
	0	2	0	0	

S Jurupa Ave – EASTBOUND

	AM	NOON	PM	
Exit	119	0	117	
U-Turn	0	0	0	0
Left	32	0	29	1
Thru	0	0	0	0
Right	79	0	137	1

S Jurupa Ave – WESTBOUND

		PM	NOON	AM
Right	0	0	0	0
Thru	0	0	0	0
Left	0	0	0	0
U-Turn	0	0	0	0
Exit		0	0	0

CONTROL

Signalized

	AM	NOON	PM
TEV	1816	0	2598
PHF	0.95		0.90

S Riverside Ave – NORTHBOUND

	Exit (to south)	U-Turn	Left	Thru	Right
		0	1	2	0
PM	1429	2	78	1023	0
NOON	0	0	0	0	0
AM	961	3	75	704	0

Cars (AM)

Approach	Left	Thru	Right	U-Turn
Southbound		761	41	0
Eastbound	27	0	62	
Westbound	0	0	0	
Northbound	64	560		0

2axle (AM)

Approach	Left	Thru	Right	U-Turn
Southbound		24	1	0
Eastbound	2	0	5	
Westbound	0	0	0	
Northbound	4	30		0

Cars (NOON)

All movements: N/A

2axle (NOON)

All movements: N/A

Cars (PM)

Approach	Left	Thru	Right	U-Turn
Southbound		1149	33	0
Eastbound	29	0	130	
Westbound	0	0	0	
Northbound	68	935		0

2axle (PM)

Approach	Left	Thru	Right	U-Turn
Southbound		12	4	0
Eastbound	0	0	0	
Westbound	0	0	0	
Northbound	1	13		0

Pedestrians (Crosswalks)

Crosswalk	AM	NOON	PM
North leg	0 0	0 0	0 0
South leg	0 0	0 0	0 0
West leg	0 0	0 0	0 0
East leg	0 0	0 0	0 0
NW corner	0	0	0
NE corner	0	0	0
SW corner	0	0	0
SE corner	0	0	0

National Data & Surveying Services **Intersection Turning Movement Count**

Location: S Riverside Ave & S Jurupa Ave
City: Bloomington
Control: Signalized

Project ID: 18-06047-007
Date: 4/12/2018

Total

NS/EW Streets:	S Riverside Ave				S Riverside Ave				S Jurupa Ave				S Jurupa Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	0	2	0	0	1	0	1	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	19	178	0	0	0	174	9	0	5	0	20	0	0	0	0	0	405
7:15 AM	22	161	0	0	0	207	12	0	4	0	13	0	0	0	0	0	419
7:30 AM	21	181	0	2	0	227	11	0	6	0	18	0	0	0	0	0	466
7:45 AM	16	197	0	1	0	225	10	0	9	0	19	0	0	0	0	0	477
8:00 AM	16	165	0	0	0	220	11	0	13	0	29	0	0	0	0	0	454
8:15 AM	14	138	0	0	0	218	7	0	9	0	13	0	0	0	0	0	399
8:30 AM	17	155	0	0	0	192	8	0	7	0	26	0	0	0	0	0	405
8:45 AM	17	192	0	0	0	165	9	0	15	0	23	0	0	0	0	0	421
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	142	1367	0	3	0	1628	77	0	68	0	161	0	0	0	0	0	3446
APPROACH %'s :	9.39%	90.41%	0.00%	0.20%	0.00%	95.48%	4.52%	0.00%	29.69%	0.00%	70.31%	0.00%					
PEAK HR :	07:15 AM - 08:15 AM																TOTAL
PEAK HR VOL :	75	704	0	3	0	879	44	0	32	0	79	0	0	0	0	0	1816
PEAK HR FACTOR :	0.852	0.893	0.000	0.375	0.000	0.968	0.917	0.000	0.615	0.000	0.681	0.000	0.000	0.000	0.000	0.000	0.952
	0.914				0.970				0.661								

	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
PM	1	2	0	0	0	2	0	0	1	0	1	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	23	239	0	2	0	261	14	0	14	0	36	0	0	0	0	0	589
4:15 PM	17	208	0	2	0	265	14	0	17	0	46	0	0	0	0	0	569
4:30 PM	11	186	0	0	0	258	9	0	9	0	42	0	0	0	0	0	515
4:45 PM	20	226	0	0	0	246	15	0	10	0	22	0	0	0	0	0	539
5:00 PM	22	238	0	0	0	289	8	0	12	0	39	0	0	0	0	0	608
5:15 PM	14	291	0	1	0	364	13	0	4	0	31	0	0	0	0	0	718
5:30 PM	22	252	0	1	0	355	8	0	4	0	41	0	0	0	0	0	683
5:45 PM	20	242	0	0	0	282	10	0	9	0	26	0	0	0	0	0	589
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	149	1882	0	6	0	2320	91	0	79	0	283	0	0	0	0	0	4810
APPROACH %'s :	7.31%	92.39%	0.00%	0.29%	0.00%	96.23%	3.77%	0.00%	21.82%	0.00%	78.18%	0.00%					
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	78	1023	0	2	0	1290	39	0	29	0	137	0	0	0	0	0	2598
PEAK HR FACTOR :	0.886	0.879	0.000	0.500	0.000	0.886	0.750	0.000	0.604	0.000	0.835	0.000	0.000	0.000	0.000	0.000	0.905
	0.901				0.881				0.814								

National Data & Surveying Services Intersection Turning Movement Count

Location: S Riverside Ave & S Jurupa Ave
City: Bloomington
Control: Signalized

Project ID: 18-06047-007
Date: 4/12/2018

Cars

NS/EW Streets:	S Riverside Ave				S Riverside Ave				S Jurupa Ave				S Jurupa Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	0	2	0	0	1	0	1	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	19	141	0	0	0	143	9	0	4	0	15	0	0	0	0	0	331
7:15 AM	20	127	0	0	0	178	12	0	3	0	10	0	0	0	0	0	350
7:30 AM	17	152	0	0	0	198	10	0	6	0	14	0	0	0	0	0	397
7:45 AM	14	152	0	1	0	194	10	0	7	0	15	0	0	0	0	0	393
8:00 AM	13	129	0	0	0	191	9	0	11	0	23	0	0	0	0	0	376
8:15 AM	12	97	0	0	0	171	6	0	8	0	10	0	0	0	0	0	304
8:30 AM	15	103	0	0	0	148	8	0	5	0	12	0	0	0	0	0	291
8:45 AM	16	147	0	0	0	122	8	0	11	0	14	0	0	0	0	0	318
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	126	1048	0	1	0	1345	72	0	55	0	113	0	0	0	0	0	2760
APPROACH %'s :	10.72%	89.19%	0.00%	0.09%	0.00%	94.92%	5.08%	0.00%	32.74%	0.00%	67.26%	0.00%					
PEAK HR :	07:15 AM - 08:15 AM																TOTAL
PEAK HR VOL :	64	560	0	1	0	761	41	0	27	0	62	0	0	0	0	0	1516
PEAK HR FACTOR :	0.80	0.921	0.000	0.250	0.000	0.961	0.854	0.000	0.614	0.000	0.674	0.000	0.000	0.000	0.000	0.000	0.955
	0.925				0.964				0.654								

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	0	2	0	0	1	0	1	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	20	215	0	2	0	224	14	0	13	0	31	0	0	0	0	0	519
4:15 PM	12	179	0	2	0	224	12	0	17	0	41	0	0	0	0	0	487
4:30 PM	7	166	0	0	0	226	8	0	9	0	38	0	0	0	0	0	454
4:45 PM	16	197	0	0	0	219	12	0	9	0	21	0	0	0	0	0	474
5:00 PM	18	218	0	0	0	258	8	0	12	0	36	0	0	0	0	0	550
5:15 PM	13	270	0	1	0	329	9	0	4	0	27	0	0	0	0	0	653
5:30 PM	19	230	0	1	0	319	8	0	4	0	41	0	0	0	0	0	622
5:45 PM	18	217	0	0	0	243	8	0	9	0	26	0	0	0	0	0	521
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	123	1692	0	6	0	2042	79	0	77	0	261	0	0	0	0	0	4280
APPROACH %'s :	6.75%	92.92%	0.00%	0.33%	0.00%	96.28%	3.72%	0.00%	22.78%	0.00%	77.22%	0.00%					
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	68	935	0	2	0	1149	33	0	29	0	130	0	0	0	0	0	2346
PEAK HR FACTOR :	0.89	0.866	0.000	0.500	0.000	0.873	0.917	0.000	0.604	0.000	0.793	0.000	0.000	0.000	0.000	0.000	0.898
	0.885				0.874				0.828								

National Data & Surveying Services Intersection Turning Movement Count

Location: S Riverside Ave & S Jurupa Ave
City: Bloomington
Control: Signalized

Project ID: 18-06047-007
Date: 4/12/2018

2axle

NS/EW Streets:	S Riverside Ave				S Riverside Ave				S Jurupa Ave				S Jurupa Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	0	2	0	0	1	0	1	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	10	0	0	0	6	0	0	0	0	3	0	0	0	0	0	19
7:15 AM	1	7	0	0	0	4	0	0	1	0	1	0	0	0	0	0	14
7:30 AM	2	8	0	2	0	7	0	0	0	0	2	0	0	0	0	0	21
7:45 AM	0	10	0	0	0	7	0	0	1	0	2	0	0	0	0	0	20
8:00 AM	1	5	0	0	0	6	1	0	0	0	0	0	0	0	0	0	13
8:15 AM	1	6	0	0	0	8	1	0	0	0	1	0	0	0	0	0	17
8:30 AM	1	7	0	0	0	8	0	0	0	0	6	0	0	0	0	0	22
8:45 AM	1	11	0	0	0	6	0	0	3	0	6	0	0	0	0	0	27
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	7	64	0	2	0	52	2	0	5	0	21	0	0	0	0	0	153
APPROACH %'s :	9.59%	87.67%	0.00%	2.74%	0.00%	96.30%	3.70%	0.00%	19.23%	0.00%	80.77%	0.00%					
PEAK HR :	07:15 AM - 08:15 AM																TOTAL
PEAK HR VOL :	4	30	0	2	0	24	1	0	2	0	5	0	0	0	0	0	68
PEAK HR FACTOR :	0.500	0.750	0.000	0.250	0.000	0.857	0.250	0.000	0.500	0.000	0.625	0.000	0.000	0.000	0.000	0.000	0.810
	0.750				0.893				0.583								

NS/EW Streets:	S Riverside Ave				S Riverside Ave				S Jurupa Ave				S Jurupa Ave				
PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	0	2	0	0	1	0	1	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	3	0	0	0	7	0	0	1	0	0	0	0	0	0	0	11
4:15 PM	1	4	0	0	0	7	1	0	0	0	2	0	0	0	0	0	15
4:30 PM	1	4	0	0	0	4	1	0	0	0	2	0	0	0	0	0	12
4:45 PM	3	5	0	0	0	3	3	0	0	0	1	0	0	0	0	0	15
5:00 PM	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
5:15 PM	1	5	0	0	0	3	3	0	0	0	0	0	0	0	0	0	12
5:30 PM	0	3	0	0	0	5	0	0	0	0	0	0	0	0	0	0	8
5:45 PM	0	3	0	0	0	4	1	0	0	0	0	0	0	0	0	0	8
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	6	29	0	0	0	33	9	0	1	0	5	0	0	0	0	0	83
APPROACH %'s :	17.14%	82.86%	0.00%	0.00%	0.00%	78.57%	21.43%	0.00%	16.67%	0.00%	83.33%	0.00%					
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	1	13	0	0	0	12	4	0	0	0	0	0	0	0	0	0	30
PEAK HR FACTOR :	0.25	0.650	0.000	0.000	0.000	0.600	0.333	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.625
	0.583				0.667												

National Data & Surveying Services **Intersection Turning Movement Count**

Location: S Riverside Ave & S Jurupa Ave
City: Bloomington
Control: Signalized

Project ID: 18-06047-007
Date: 4/12/2018

3axle

NS/EW Streets:	S Riverside Ave				S Riverside Ave				S Jurupa Ave				S Jurupa Ave				
	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
AM	1	2	0	0	0	2	0	0	1	0	1	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	5	0	0	0	4	0	0	1	0	1	0	0	0	0	0	11
7:15 AM	0	5	0	0	0	5	0	0	0	0	0	0	0	0	0	0	10
7:30 AM	1	6	0	0	0	5	0	0	0	0	1	0	0	0	0	0	13
7:45 AM	0	6	0	0	0	5	0	0	0	0	1	0	0	0	0	0	12
8:00 AM	1	8	0	0	0	7	0	0	2	0	1	0	0	0	0	0	19
8:15 AM	0	2	0	0	0	11	0	0	0	0	2	0	0	0	0	0	15
8:30 AM	1	8	0	0	0	6	0	0	0	0	2	0	0	0	0	0	17
8:45 AM	0	9	0	0	0	7	0	0	1	0	1	0	0	0	0	0	18
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	3	49	0	0	0	50	0	0	4	0	9	0	0	0	0	0	115
APPROACH %'s :	5.77%	94.23%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	30.77%	0.00%	69.23%	0.00%					
PEAK HR :	07:15 AM - 08:15 AM																TOTAL
PEAK HR VOL :	2	25	0	0	0	22	0	0	2	0	3	0	0	0	0	0	54
PEAK HR FACTOR :	0.500	0.781	0.000	0.000	0.000	0.786	0.000	0.000	0.250	0.000	0.750	0.000	0.000	0.000	0.000	0.000	0.711
	0.750				0.786				0.417								

NS/EW Streets:	S Riverside Ave				S Riverside Ave				S Jurupa Ave				S Jurupa Ave				
	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
PM	1	2	0	0	0	2	0	0	1	0	1	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	4	0	0	0	6	0	0	0	0	3	0	0	0	0	0	13
4:15 PM	0	10	0	0	0	13	0	0	0	0	1	0	0	0	0	0	24
4:30 PM	0	4	0	0	0	7	0	0	0	0	0	0	0	0	0	0	11
4:45 PM	0	10	0	0	0	4	0	0	0	0	0	0	0	0	0	0	14
5:00 PM	1	4	0	0	0	10	0	0	0	0	1	0	0	0	0	0	16
5:15 PM	0	4	0	0	0	13	0	0	0	0	1	0	0	0	0	0	18
5:30 PM	1	6	0	0	0	10	0	0	0	0	0	0	0	0	0	0	17
5:45 PM	1	3	0	0	0	9	0	0	0	0	0	0	0	0	0	0	13
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	3	45	0	0	0	72	0	0	0	0	6	0	0	0	0	0	126
APPROACH %'s :	6.25%	93.75%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%	0.00%	100.00%	0.00%					
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	3	17	0	0	0	42	0	0	0	0	2	0	0	0	0	0	64
PEAK HR FACTOR :	0.75	0.708	0.000	0.000	0.000	0.808	0.000	0.000	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.889
	0.714				0.808				0.500								

National Data & Surveying Services Intersection Turning Movement Count

Location: S Riverside Ave & S Jurupa Ave
City: Bloomington
Control: Signalized

Project ID: 18-06047-007
Date: 4/12/2018

4axle

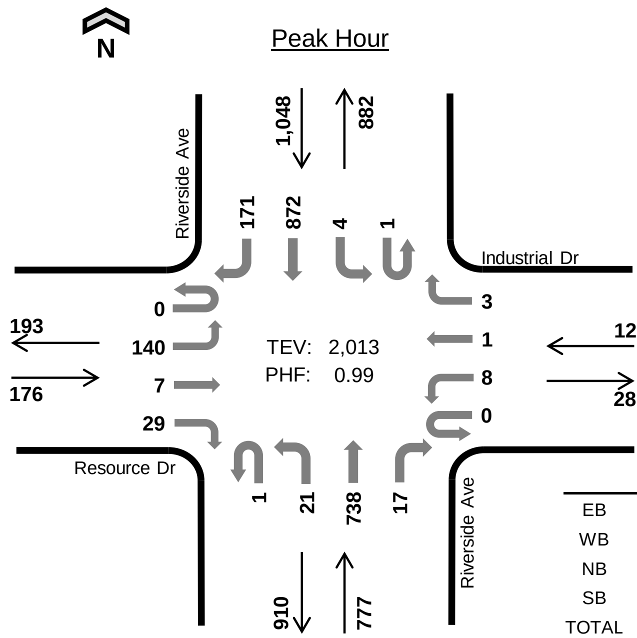
NS/EW Streets:	S Riverside Ave				S Riverside Ave				S Jurupa Ave				S Jurupa Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	0	2	0	0	1	0	1	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	22	0	0	0	21	0	0	0	0	1	0	0	0	0	0	44
7:15 AM	1	22	0	0	0	20	0	0	0	0	2	0	0	0	0	0	45
7:30 AM	1	15	0	0	0	17	1	0	0	0	1	0	0	0	0	0	35
7:45 AM	2	29	0	0	0	19	0	0	1	0	1	0	0	0	0	0	52
8:00 AM	1	23	0	0	0	16	1	0	0	0	5	0	0	0	0	0	46
8:15 AM	1	33	0	0	0	28	0	0	1	0	0	0	0	0	0	0	63
8:30 AM	0	37	0	0	0	30	0	0	2	0	6	0	0	0	0	0	75
8:45 AM	0	25	0	0	0	30	1	0	0	0	2	0	0	0	0	0	58
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	6	206	0	0	0	181	3	0	4	0	18	0	0	0	0	0	418
APPROACH %'s :	2.83%	97.17%	0.00%	0.00%	0.00%	98.37%	1.63%	0.00%	18.18%	0.00%	81.82%	0.00%					
PEAK HR :	07:15 AM - 08:15 AM																TOTAL
PEAK HR VOL :	5	89	0	0	0	72	2	0	1	0	9	0	0	0	0	0	178
PEAK HR FACTOR :	0.625	0.767	0.000	0.000	0.000	0.900	0.500	0.000	0.250	0.000	0.450	0.000	0.000	0.000	0.000	0.000	0.856
	0.758				0.925				0.500								

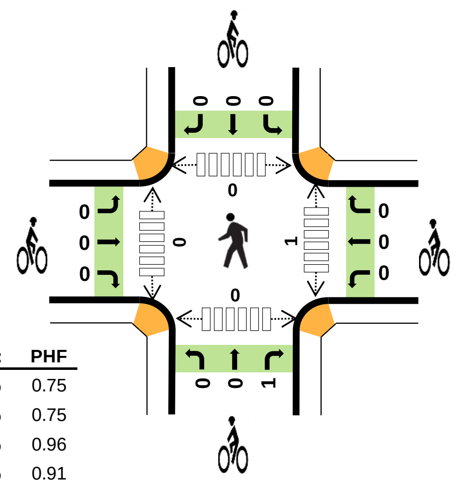
	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
PM	1	2	0	0	0	2	0	0	1	0	1	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	3	17	0	0	0	24	0	0	0	0	2	0	0	0	0	0	46
4:15 PM	4	15	0	0	0	21	1	0	0	0	2	0	0	0	0	0	43
4:30 PM	3	12	0	0	0	21	0	0	0	0	2	0	0	0	0	0	38
4:45 PM	1	14	0	0	0	20	0	0	1	0	0	0	0	0	0	0	36
5:00 PM	3	14	0	0	0	21	0	0	0	0	2	0	0	0	0	0	40
5:15 PM	0	12	0	0	0	19	1	0	0	0	3	0	0	0	0	0	35
5:30 PM	2	13	0	0	0	21	0	0	0	0	0	0	0	0	0	0	36
5:45 PM	1	19	0	0	0	26	1	0	0	0	0	0	0	0	0	0	47
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	17	116	0	0	0	173	3	0	1	0	11	0	0	0	0	0	321
APPROACH %'s :	12.78%	87.22%	0.00%	0.00%	0.00%	98.30%	1.70%	0.00%	8.33%	0.00%	91.67%	0.00%					
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	6	58	0	0	0	87	2	0	0	0	5	0	0	0	0	0	158
PEAK HR FACTOR :	0.50	0.763	0.000	0.000	0.000	0.837	0.500	0.000	0.000	0.000	0.417	0.000	0.000	0.000	0.000	0.000	0.840
	0.800				0.824				0.417								

Riverside Ave
Resource Dr

Date: 05/15/2018
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:15 AM to 8:15 AM

Peak Hour





	HV %:	PHF
EB	27.8%	0.75
WB	58.3%	0.75
NB	17.6%	0.96
SB	17.9%	0.91
TOTAL	18.9%	0.99

Two-Hour Count Summaries

Interval Start		Resource Dr Eastbound UT	LT	TH	RT	Industrial Dr Westbound UT	LT	TH	RT	Riverside Ave Northbound UT	LT	TH	RT	Riverside Ave Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
7:00 AM		0	19	0	5	0	1	0	0	0	2	159	2	0	1	239	30	458	0
7:15 AM		**0**	**20**	**0**	**5**	**0**	**3**	**1**	**0**	**0**	**6**	**169**	**9**	**1**	**0**	**236**	**52**	**502**	0
7:30 AM		**0**	**40**	**3**	**7**	**0**	**1**	**0**	**1**	**0**	**5**	**181**	**2**	**0**	**2**	**232**	**34**	**508**	0
7:45 AM		**0**	**35**	**2**	**5**	**0**	**2**	**0**	**2**	**0**	**5**	**195**	**3**	**0**	**1**	**203**	**40**	**493**	1,961
8:00 AM		**0**	**45**	**2**	**12**	**0**	**2**	**0**	**0**	**1**	**5**	**193**	**3**	**0**	**1**	**201**	**45**	**510**	**2,013**
8:15 AM		0	42	0	8	0	1	0	1	0	6	159	6	0	0	174	35	432	1,943
8:30 AM		0	49	1	11	0	1	0	2	0	5	169	3	1	2	184	35	463	1,898
8:45 AM		0	29	0	20	0	10	0	3	0	7	154	2	0	2	162	30	419	1,824
Count Total		0	279	8	73	0	21	1	9	1	41	1,379	30	2	9	1,631	301	3,785	0
Peak Hour	**All**	**0**	**140**	**7**	**29**	**0**	**8**	**1**	**3**	**1**	**21**	**738**	**17**	**1**	**4**	**872**	**171**	**2,013**	**0**
	HV	**0**	**45**	**3**	**1**	**0**	**5**	**1**	**1**	**0**	**9**	**124**	**4**	**0**	**3**	**143**	**42**	**381**	**0**
	HV%	**-**	**32%**	**43%**	**3%**	**-**	**63%**	**100%**	**33%**	**0%**	**43%**	**17%**	**24%**	**0%**	**75%**	**16%**	**25%**	**19%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
7:00 AM	13	1	34	46	*94*	0	0	0	0	*0*	0	0	0	0	*0*
7:15 AM	**12**	**2**	**41**	**53**	***108***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
7:30 AM	**13**	**1**	**25**	**46**	***85***	**0**	**0**	**1**	**0**	***1***	**1**	**0**	**0**	**0**	*1*
7:45 AM	**15**	**2**	**34**	**45**	***96***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
8:00 AM	**9**	**2**	**37**	**44**	***92***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
8:15 AM	9	2	51	42	*104*	0	0	0	0	*0*	2	0	0	1	*3*
8:30 AM	12	1	36	63	*112*	0	0	0	0	*0*	0	0	0	0	*0*
8:45 AM	24	9	43	61	*137*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	107	20	301	400	*828*	0	0	1	0	*1*	3	0	0	1	*4*
Peak Hour	**49**	**7**	**137**	**188**	***381***	**0**	**0**	**1**	**0**	***1***	**1**	**0**	**0**	**0**	***1***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Resource Dr Eastbound UT	LT	TH	RT	Industrial Dr Westbound UT	LT	TH	RT	Riverside Ave Northbound UT	LT	TH	RT	Riverside Ave Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
7:00 AM	0	11	0	2	0	1	0	0	0	1	33	0	0	0	33	13	94	0
7:15 AM	**0**	**12**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**6**	**32**	**3**	**0**	**0**	**40**	**13**	**108**	0
7:30 AM	**0**	**11**	**1**	**1**	**0**	**1**	**0**	**0**	**0**	**1**	**24**	**0**	**0**	**2**	**32**	**12**	**85**	0
7:45 AM	**0**	**15**	**0**	**0**	**0**	**1**	**0**	**1**	**0**	**1**	**32**	**1**	**0**	**0**	**34**	**11**	**96**	383
8:00 AM	**0**	**7**	**2**	**0**	**0**	**2**	**0**	**0**	**0**	**1**	**36**	**0**	**0**	**1**	**37**	**6**	**92**	**381**
8:15 AM	0	9	0	0	0	1	0	1	0	2	48	1	0	0	30	12	104	377
8:30 AM	0	10	0	2	0	0	0	1	0	1	33	2	1	1	41	20	112	404
8:45 AM	0	13	0	11	0	9	0	0	0	2	39	2	0	2	47	12	137	445
Count Total	0	88	3	16	0	16	1	3	0	15	277	9	1	6	294	99	828	0
Peak Hour	**0**	**45**	**3**	**1**	**0**	**5**	**1**	**1**	**0**	**9**	**124**	**4**	**0**	**3**	**143**	**42**	**381**	**0**

Two-Hour Count Summaries - Bikes

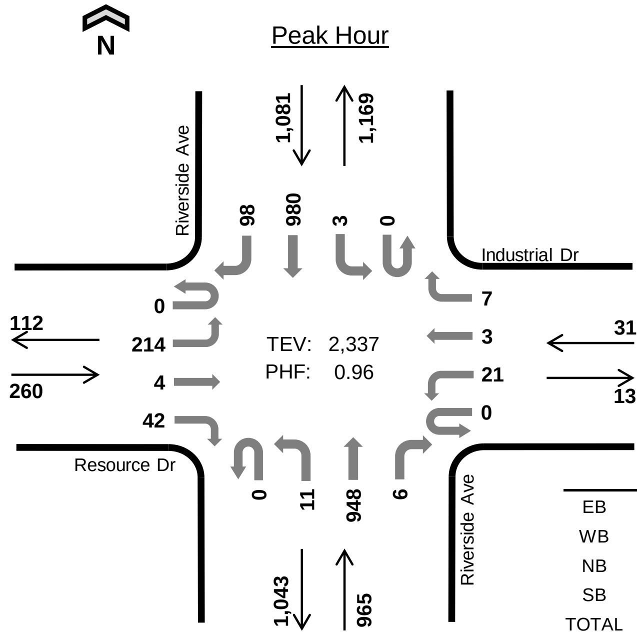
Interval Start	Resource Dr Eastbound LT	TH	RT	Industrial Dr Westbound LT	TH	RT	Riverside Ave Northbound LT	TH	RT	Riverside Ave Southbound LT	TH	RT	15-min Total	Rolling One Hour
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
7:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	0
7:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	1
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	0	0	0	0	0	0	1	0	0	0	1	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

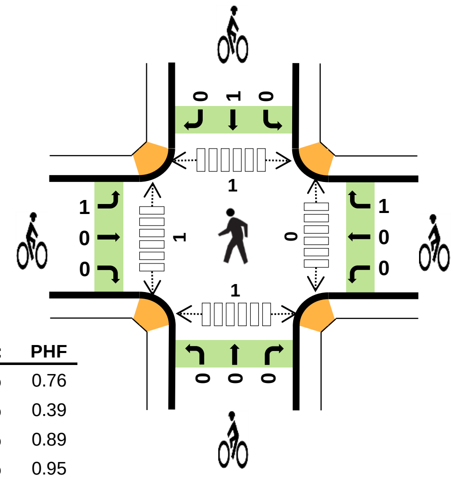
Riverside Ave
Resource Dr

Date: 05/15/2018
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:30 PM to 5:30 PM

Peak Hour



	HV %:	PHF
EB	12.7%	0.76
WB	22.6%	0.39
NB	11.2%	0.89
SB	15.5%	0.95
TOTAL	13.5%	0.96



Two-Hour Count Summaries

Interval Start		Resource Dr Eastbound UT	LT	TH	RT	Industrial Dr Westbound UT	LT	TH	RT	Riverside Ave Northbound UT	LT	TH	RT	Riverside Ave Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
4:00 PM		0	57	0	9	0	7	0	2	0	0	230	4	0	2	259	24	594	0
4:15 PM		0	26	0	7	0	5	0	1	0	2	242	4	0	1	246	19	553	0
4:30 PM		**0**	**46**	**1**	**8**	**0**	**17**	**1**	**2**	**0**	**1**	**213**	**3**	**0**	**0**	**231**	**21**	**544**	0
4:45 PM		**0**	**46**	**1**	**9**	**0**	**2**	**1**	**4**	**0**	**4**	**223**	**1**	**0**	**1**	**263**	**19**	**574**	2,265
5:00 PM		**0**	**51**	**0**	**12**	**0**	**2**	**1**	**0**	**0**	**1**	**268**	**1**	**0**	**1**	**246**	**27**	**610**	2,281
5:15 PM		**0**	**71**	**2**	**13**	**0**	**0**	**0**	**1**	**0**	**5**	**244**	**1**	**0**	**1**	**240**	**31**	**609**	**2,337**
5:30 PM		0	43	1	7	0	1	0	1	0	7	217	1	1	0	211	51	541	2,334
5:45 PM		0	33	4	23	0	3	0	1	0	10	121	14	0	8	244	66	527	2,287
Count Total		0	373	9	88	0	37	3	12	0	30	1,758	29	1	14	1,940	258	4,552	0
Peak Hour	**All**	**0**	**214**	**4**	**42**	**0**	**21**	**3**	**7**	**0**	**11**	**948**	**6**	**0**	**3**	**980**	**98**	**2,337**	**0**
	HV	**0**	**22**	**3**	**8**	**0**	**2**	**1**	**4**	**0**	**3**	**102**	**3**	**0**	**2**	**127**	**39**	**316**	**0**
	HV%	**-**	**10%**	**75%**	**19%**	**-**	**10%**	**33%**	**57%**	**-**	**27%**	**11%**	**50%**	**-**	**67%**	**13%**	**40%**	**14%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
4:00 PM	12	2	22	54	*90*	0	0	0	0	*0*	0	1	0	0	*1*
4:15 PM	8	1	32	53	*94*	0	0	0	0	*0*	0	0	0	0	*0*
4:30 PM	**11**	**3**	**26**	**52**	***92***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
4:45 PM	**12**	**4**	**26**	**37**	***79***	**0**	**0**	**0**	**1**	***1***	**0**	**0**	**0**	**0**	*0*
5:00 PM	**4**	**0**	**28**	**42**	***74***	**0**	**1**	**0**	**0**	***1***	**0**	**1**	**1**	**0**	*2*
5:15 PM	**6**	**0**	**28**	**37**	***71***	**1**	**0**	**0**	**0**	***1***	**0**	**0**	**0**	**1**	***1***
5:30 PM	6	1	25	36	*68*	0	0	0	0	*0*	0	0	0	0	*0*
5:45 PM	19	1	19	47	*86*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	78	12	206	358	*654*	1	1	0	1	*3*	0	2	1	1	*4*
Peak Hour	**33**	**7**	**108**	**168**	***316***	**1**	**1**	**0**	**1**	***3***	**0**	**1**	**1**	**1**	***3***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Resource Dr				Industrial Dr				Riverside Ave				Riverside Ave				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	10	0	2	0	1	0	1	0	0	19	3	0	2	38	14	90	0
4:15 PM	0	4	0	4	0	0	0	1	0	2	29	1	0	1	39	13	94	0
4:30 PM	**0**	**7**	**1**	**3**	**0**	**2**	**0**	**1**	**0**	**0**	**24**	**2**	**0**	**0**	**39**	**13**	**92**	0
4:45 PM	**0**	**9**	**1**	**2**	**0**	**0**	**1**	**3**	**0**	**2**	**23**	**1**	**0**	**0**	**31**	**6**	**79**	355
5:00 PM	**0**	**2**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**28**	**0**	**0**	**1**	**28**	**13**	**74**	339
5:15 PM	**0**	**4**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**27**	**0**	**0**	**1**	**29**	**7**	**71**	**316**
5:30 PM	0	5	1	0	0	0	0	1	0	0	24	1	0	0	33	3	68	292
5:45 PM	0	9	4	6	0	0	0	1	0	1	16	2	0	4	31	12	86	299
Count Total	0	50	8	20	0	3	1	8	0	6	190	10	0	9	268	81	654	0
Peak Hour	**0**	**22**	**3**	**8**	**0**	**2**	**1**	**4**	**0**	**3**	**102**	**3**	**0**	**2**	**127**	**39**	**316**	**0**

Two-Hour Count Summaries - Bikes

Interval Start	Resource Dr			Industrial Dr			Riverside Ave			Riverside Ave			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
4:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	1
5:00 PM	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	2
5:15 PM	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**3**
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	3
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Count Total	1	0	0	0	0	1	0	0	0	0	1	0	3	0
Peak Hour	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**3**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

National Data & Surveying Services

Intersection Turning Movement Count

Location: Riverside Ave & Agua Mansa Rd
City: Colton
Control: Signalized

Project ID: Historical
Date: 3/7/2019

Total

NS/EW Streets:	Riverside Ave				Riverside Ave				Agua Mansa Rd				Agua Mansa Rd				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	1	2	1	0	1	1	1	0	1	1	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	25	142	9	1	5	165	22	0	28	20	9	0	13	47	16	0	502
7:15 AM	22	148	3	2	6	209	26	0	22	20	14	0	23	65	13	0	573
7:30 AM	22	150	7	2	11	223	26	0	28	23	15	0	12	68	11	0	598
7:45 AM	26	135	3	2	13	195	23	0	26	20	19	0	34	63	5	0	564
8:00 AM	22	139	11	1	12	166	22	0	22	18	16	0	21	43	12	0	505
8:15 AM	30	154	8	1	13	132	19	0	26	23	17	0	11	26	11	0	471
8:30 AM	15	127	10	1	6	152	30	0	34	18	17	0	9	31	12	0	462
8:45 AM	19	117	4	2	11	150	21	0	21	19	10	0	6	27	7	0	414
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	181	1112	55	12	77	1392	189	0	207	161	117	0	129	370	87	0	4089
APPROACH %'s :	13.31%	81.76%	4.04%	0.88%	4.64%	83.96%	11.40%	0.00%	42.68%	33.20%	24.12%	0.00%	22.01%	63.14%	14.85%	0.00%	
PEAK HR :	07:15 AM - 08:15 AM																TOTAL
PEAK HR VOL :	92	572	24	7	42	793	97	0	98	81	64	0	90	239	41	0	2240
PEAK HR FACTOR :	0.885	0.953	0.545	0.875	0.808	0.889	0.933	0.000	0.875	0.880	0.842	0.000	0.662	0.879	0.788	0.000	0.936
	0.960				0.896				0.920				0.907				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	1	2	1	0	1	1	1	0	1	1	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	26	165	11	6	14	180	17	0	37	94	45	0	18	40	12	0	665
4:15 PM	27	174	22	3	24	223	24	0	21	103	32	0	9	31	18	0	711
4:30 PM	23	174	14	0	17	204	32	0	35	97	36	0	11	46	14	0	703
4:45 PM	31	183	24	3	17	221	32	0	25	72	26	1	6	40	13	0	694
5:00 PM	26	167	18	4	20	230	34	0	28	109	45	0	16	32	13	0	742
5:15 PM	32	178	23	4	17	236	21	0	24	93	38	0	18	43	8	0	735
5:30 PM	19	148	9	0	20	215	22	0	25	102	40	1	14	35	22	0	672
5:45 PM	19	152	18	4	19	212	16	0	29	79	33	0	17	31	11	0	640
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	203	1341	139	24	148	1721	198	0	224	749	295	2	109	298	111	0	5562
APPROACH %'s :	11.89%	78.56%	8.14%	1.41%	7.16%	83.26%	9.58%	0.00%	17.64%	58.98%	23.23%	0.16%	21.04%	57.53%	21.43%	0.00%	
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	112	702	79	11	71	891	119	0	112	371	145	1	51	161	48	0	2874
PEAK HR FACTOR :	0.875	0.959	0.823	0.688	0.888	0.944	0.875	0.000	0.800	0.851	0.806	0.250	0.708	0.875	0.857	0.000	0.968
	0.938				0.952				0.864				0.915				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Riverside Ave & Agua Mansa Rd
City: Colton
Control: Signalized

Project ID: Historical
Date: 3/7/2019

Cars

NS/EW Streets:	Riverside Ave				Riverside Ave				Agua Mansa Rd				Agua Mansa Rd				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	1	2	1	0	1	1	1	0	1	1	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	21	123	4	1	4	150	17	0	24	17	6	0	10	42	3	0	422
7:15 AM	19	132	0	2	3	192	19	0	16	20	11	0	19	58	11	0	502
7:30 AM	19	136	4	2	8	213	18	0	20	20	11	0	9	63	6	0	529
7:45 AM	17	123	0	2	8	176	12	0	21	16	14	0	31	59	2	0	481
8:00 AM	12	120	8	1	7	142	16	0	18	15	14	0	17	37	9	0	416
8:15 AM	22	136	8	1	8	102	13	0	19	18	12	0	11	23	7	0	380
8:30 AM	12	109	8	1	3	119	21	0	20	14	9	0	6	22	5	0	349
8:45 AM	9	97	4	2	6	110	15	0	14	18	5	0	5	21	6	0	312
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	131	976	36	12	47	1204	131	0	152	138	82	0	108	325	49	0	3391
APPROACH %'s :	11.34%	84.50%	3.12%	1.04%	3.40%	87.12%	9.48%	0.00%	40.86%	37.10%	22.04%	0.00%	22.41%	67.43%	10.17%	0.00%	
PEAK HR :	07:15 AM - 08:15 AM																TOTAL
PEAK HR VOL :	67	511	12	7	26	723	65	0	75	71	50	0	76	217	28	0	1928
PEAK HR FACTOR :	0.88	0.939	0.375	0.875	0.813	0.849	0.855	0.000	0.893	0.888	0.893	0.000	0.613	0.861	0.636	0.000	0.911
	0.927				0.851				0.961				0.872				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	1	2	1	0	1	1	1	0	1	1	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	18	157	9	6	10	163	10	0	29	92	37	0	16	37	9	0	593
4:15 PM	20	157	20	3	18	203	15	0	15	98	28	0	7	26	12	0	622
4:30 PM	18	157	9	0	15	193	25	0	31	95	33	0	8	39	11	0	634
4:45 PM	21	168	18	3	13	207	22	0	18	69	23	1	4	36	10	0	613
5:00 PM	22	156	17	4	17	217	24	0	23	104	43	0	16	27	7	0	677
5:15 PM	30	166	20	4	15	222	17	0	16	92	34	0	17	36	3	0	672
5:30 PM	16	135	8	0	17	204	12	0	19	96	36	1	13	33	11	0	601
5:45 PM	11	142	15	4	15	200	12	0	21	76	28	0	14	27	5	0	570
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	156	1238	116	24	120	1609	137	0	172	722	262	2	95	261	68	0	4982
APPROACH %'s :	10.17%	80.70%	7.56%	1.56%	6.43%	86.23%	7.34%	0.00%	14.85%	62.35%	22.63%	0.17%	22.41%	61.56%	16.04%	0.00%	
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	91	647	64	11	60	839	88	0	88	360	133	1	45	138	31	0	2596
PEAK HR FACTOR :	0.76	0.963	0.800	0.688	0.882	0.945	0.880	0.000	0.710	0.865	0.773	0.250	0.662	0.885	0.705	0.000	0.959
	0.924				0.956				0.856				0.922				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Riverside Ave & Agua Mansa Rd
City: Colton
Control: Signalized

Project ID: Historical
Date: 3/7/2019

2axle

NS/EW Streets:	Riverside Ave				Riverside Ave				Agua Mansa Rd				Agua Mansa Rd				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	1	2	1	0	1	1	1	0	1	1	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	2	11	4	0	0	3	2	0	0	3	1	0	1	0	2	0	29
7:15 AM	2	6	1	0	1	7	1	0	3	0	1	0	1	2	0	0	25
7:30 AM	1	7	1	0	1	1	1	0	1	2	1	0	2	2	1	0	21
7:45 AM	5	6	2	0	2	6	2	0	2	0	3	0	1	1	1	0	31
8:00 AM	4	3	1	0	0	4	1	0	0	1	1	0	2	2	1	0	20
8:15 AM	6	4	0	0	1	11	1	0	1	1	3	0	0	0	0	0	28
8:30 AM	1	7	0	0	0	18	1	0	1	1	2	0	0	3	1	0	35
8:45 AM	2	5	0	0	1	24	0	0	1	0	1	0	0	1	0	0	35
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	23	49	9	0	6	74	9	0	9	8	13	0	7	11	6	0	224
APPROACH %'s :	28.40%	60.49%	11.11%	0.00%	6.74%	83.15%	10.11%	0.00%	30.00%	26.67%	43.33%	0.00%	29.17%	45.83%	25.00%	0.00%	
PEAK HR :	07:15 AM - 08:15 AM																TOTAL
PEAK HR VOL :	12	22	5	0	4	18	5	0	6	3	6	0	6	7	3	0	97
PEAK HR FACTOR :	0.600	0.786	0.625	0.000	0.500	0.643	0.625	0.000	0.500	0.375	0.500	0.000	0.750	0.875	0.750	0.000	0.782
	0.750				0.675				0.750				0.800				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	1	2	1	0	1	1	1	0	1	1	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	5	5	2	0	0	4	2	0	1	1	4	0	2	1	1	0	28
4:15 PM	4	10	1	0	1	5	4	0	0	5	1	0	2	2	1	0	36
4:30 PM	3	6	3	0	0	3	1	0	1	1	3	0	2	2	0	0	25
4:45 PM	7	4	2	0	1	3	3	0	0	2	2	0	2	1	0	0	27
5:00 PM	3	3	0	0	0	6	1	0	2	4	1	0	0	3	0	0	23
5:15 PM	1	3	1	0	0	1	1	0	0	0	2	0	1	1	0	0	11
5:30 PM	1	3	0	0	0	3	0	0	1	3	3	0	0	2	0	0	16
5:45 PM	4	1	0	0	0	2	0	0	0	1	0	0	0	1	0	0	9
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	28	35	9	0	2	27	12	0	5	17	16	0	9	13	2	0	175
APPROACH %'s :	38.89%	48.61%	12.50%	0.00%	4.88%	65.85%	29.27%	0.00%	13.16%	44.74%	42.11%	0.00%	37.50%	54.17%	8.33%	0.00%	
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	14	16	6	0	1	13	6	0	3	7	8	0	5	7	0	0	86
PEAK HR FACTOR :	0.50	0.667	0.500	0.000	0.250	0.542	0.500	0.000	0.375	0.438	0.667	0.000	0.625	0.583	0.000	0.000	0.796
	0.692				0.714				0.643				0.750				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Riverside Ave & Agua Mansa Rd
City: Colton
Control: Signalized

Project ID: Historical
Date: 3/7/2019

3axle

NS/EW Streets:	Riverside Ave				Riverside Ave				Agua Mansa Rd				Agua Mansa Rd				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	1	2	1	0	1	1	1	0	1	1	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	2	0	0	1	1	1	0	1	0	1	0	2	1	3	0	13
7:15 AM	1	0	1	0	1	3	2	0	0	0	1	0	3	3	1	0	16
7:30 AM	0	3	1	0	0	2	0	0	4	1	1	0	0	0	3	0	15
7:45 AM	0	2	1	0	1	4	2	0	0	2	1	0	2	0	0	0	15
8:00 AM	1	5	0	0	1	6	2	0	1	0	0	0	2	1	0	0	19
8:15 AM	1	3	0	0	1	8	1	0	2	0	2	0	0	1	2	0	21
8:30 AM	0	2	0	0	1	5	2	0	4	0	1	0	1	1	2	0	19
8:45 AM	2	2	0	0	1	1	3	0	2	0	3	0	0	2	0	0	16
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	5	19	3	0	7	30	13	0	14	3	10	0	10	9	11	0	134
APPROACH %'s :	18.52%	70.37%	11.11%	0.00%	14.00%	60.00%	26.00%	0.00%	51.85%	11.11%	37.04%	0.00%	33.33%	30.00%	36.67%	0.00%	
PEAK HR :	07:15 AM - 08:15 AM																TOTAL
PEAK HR VOL :	2	10	3	0	3	15	6	0	5	3	3	0	7	4	4	0	65
PEAK HR FACTOR :	0.500	0.500	0.750	0.000	0.750	0.625	0.750	0.000	0.313	0.375	0.750	0.000	0.583	0.333	0.333	0.000	0.855
	0.625				0.667				0.458				0.536				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	1	2	1	0	1	1	1	0	1	1	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	1	0	0	1	6	0	0	2	0	2	0	0	1	0	0	13
4:15 PM	2	0	0	0	2	6	0	0	0	0	1	0	0	0	0	0	11
4:30 PM	1	1	0	0	0	3	1	0	0	0	0	0	0	1	0	0	7
4:45 PM	2	1	1	0	0	3	2	0	0	0	0	0	0	1	1	0	11
5:00 PM	0	1	1	0	1	3	6	0	0	0	0	0	0	1	0	0	13
5:15 PM	1	3	2	0	0	6	0	0	0	1	1	0	0	1	0	0	15
5:30 PM	1	4	1	0	0	6	4	0	1	0	0	0	1	0	2	0	20
5:45 PM	2	3	2	0	0	3	1	0	0	1	2	0	1	0	3	0	18
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	9	14	7	0	4	36	14	0	3	2	6	0	2	5	6	0	108
APPROACH %'s :	30.00%	46.67%	23.33%	0.00%	7.41%	66.67%	25.93%	0.00%	27.27%	18.18%	54.55%	0.00%	15.38%	38.46%	46.15%	0.00%	
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	4	6	4	0	1	15	9	0	0	1	1	0	0	4	1	0	46
PEAK HR FACTOR :	0.50	0.500	0.500	0.000	0.250	0.625	0.375	0.000	0.000	0.250	0.250	0.000	0.000	1.000	0.250	0.000	0.767
	0.583				0.625				0.250				0.625				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Riverside Ave & Agua Mansa Rd
City: Colton
Control: Signalized

Project ID: Historical
Date: 3/7/2019

4axle

NS/EW Streets:	Riverside Ave				Riverside Ave				Agua Mansa Rd				Agua Mansa Rd				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	1	2	1	0	1	1	1	0	1	1	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	2	6	1	0	0	11	2	0	3	0	1	0	0	4	8	0	38
7:15 AM	0	10	1	0	1	7	4	0	3	0	1	0	0	2	1	0	30
7:30 AM	2	4	1	0	2	7	7	0	3	0	2	0	1	3	1	0	33
7:45 AM	4	4	0	0	2	9	7	0	3	2	1	0	0	3	2	0	37
8:00 AM	5	11	2	0	4	14	3	0	3	2	1	0	0	3	2	0	50
8:15 AM	1	11	0	0	3	11	4	0	4	4	0	0	0	2	2	0	42
8:30 AM	2	9	2	0	2	10	6	0	9	3	5	0	2	5	4	0	59
8:45 AM	6	13	0	0	3	15	3	0	4	1	1	0	1	3	1	0	51
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	22	68	7	0	17	84	36	0	32	12	12	0	4	25	21	0	340
APPROACH %'s :	22.68%	70.10%	7.22%	0.00%	12.41%	61.31%	26.28%	0.00%	57.14%	21.43%	21.43%	0.00%	8.00%	50.00%	42.00%	0.00%	
PEAK HR :	07:15 AM - 08:15 AM																TOTAL
PEAK HR VOL :	11	29	4	0	9	37	21	0	12	4	5	0	1	11	6	0	150
PEAK HR FACTOR :	0.550	0.659	0.500	0.000	0.563	0.661	0.750	0.000	1.000	0.500	0.625	0.000	0.250	0.917	0.750	0.000	0.750
	0.611				0.798				0.875				0.900				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	1	2	1	0	1	1	1	0	1	1	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	3	2	0	0	3	7	5	0	5	1	2	0	0	1	2	0	31
4:15 PM	1	7	1	0	3	9	5	0	6	0	2	0	0	3	5	0	42
4:30 PM	1	10	2	0	2	5	5	0	3	1	0	0	1	4	3	0	37
4:45 PM	1	10	3	0	3	8	5	0	7	1	1	0	0	2	2	0	43
5:00 PM	1	7	0	0	2	4	3	0	3	1	1	0	0	1	6	0	29
5:15 PM	0	6	0	0	2	7	3	0	8	0	1	0	0	5	5	0	37
5:30 PM	1	6	0	0	3	2	6	0	4	3	1	0	0	0	9	0	35
5:45 PM	2	6	1	0	4	7	3	0	8	1	3	0	2	3	3	0	43
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	10	54	7	0	22	49	35	0	44	8	11	0	3	19	35	0	297
APPROACH %'s :	14.08%	76.06%	9.86%	0.00%	20.75%	46.23%	33.02%	0.00%	69.84%	12.70%	17.46%	0.00%	5.26%	33.33%	61.40%	0.00%	
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	3	33	5	0	9	24	16	0	21	3	3	0	1	12	16	0	146
PEAK HR FACTOR :	0.75	0.825	0.417	0.000	0.750	0.750	0.800	0.000	0.656	0.750	0.750	0.000	0.250	0.600	0.667	0.000	0.849
	0.732				0.766				0.750				0.725				

24-HOUR ROADWAY SEGMENT COUNTS (WITH CLASSIFICATION)

Prepared by AimTD LLC tel. 714 253 7888 cs@aimtd.com

DATE: Tuesday, June 05, 2018 | CITY: Rialto

JOB #: SC | LOCATION: South Riverside between I-10 EB Ramps and Slover

AM TIME	1	2	3	4	5	6	TOTAL	PM Time	1	2	3	4	5	6	TOTAL
0:00	74	1	0	17	0	0	92	12:00	184	25	12	55	0	0	276
0:15	78	1	3	22	0	0	104	12:15	173	22	17	57	0	1	270
0:30	55	1	3	30	0	0	89	12:30	187	30	9	57	0	0	283
0:45	57	1	1	32	0	0	91	12:45	167	21	15	46	0	1	250
1:00	53	4	4	29	0	0	90	13:00	172	14	12	44	1	1	244
1:15	39	2	1	22	0	0	64	13:15	188	20	20	37	0	1	266
1:30	54	0	1	26	0	0	81	13:30	184	14	14	46	0	0	258
1:45	41	0	1	22	0	0	64	13:45	212	28	14	52	0	1	307
2:00	36	0	1	20	0	0	57	14:00	261	28	14	41	0	1	345
2:15	42	1	0	37	0	0	80	14:15	221	26	12	39	0	1	299
2:30	43	1	2	11	0	0	57	14:30	296	29	13	26	0	0	364
2:45	28	2	1	27	0	0	58	14:45	334	19	16	24	0	2	395
3:00	36	0	0	19	0	0	55	15:00	306	27	13	35	0	1	382
3:15	41	1	2	36	0	0	80	15:15	300	23	10	34	0	1	368
3:30	45	3	1	23	0	0	72	15:30	323	17	9	29	0	0	378
3:45	66	3	0	16	0	0	85	15:45	379	16	12	24	0	1	432
4:00	67	4	3	34	0	0	108	16:00	330	17	13	24	0	0	384
4:15	72	3	7	34	0	0	116	16:15	349	23	5	36	0	0	413
4:30	58	5	4	50	0	0	117	16:30	364	20	6	34	0	0	424
4:45	66	7	7	32	0	0	112	16:45	372	21	5	18	0	0	416
5:00	52	2	3	30	0	0	87	17:00	423	21	8	26	0	0	478
5:15	71	6	10	33	0	0	120	17:15	363	21	4	29	1	0	418
5:30	63	7	6	32	0	0	108	17:30	334	25	6	35	0	2	402
5:45	88	14	11	41	0	0	154	17:45	358	9	5	23	0	0	395
6:00	99	11	12	42	0	0	164	18:00	342	14	4	24	0	0	384
6:15	102	23	13	42	0	0	180	18:15	324	12	4	24	0	1	365
6:30	125	13	7	36	0	0	181	18:30	307	14	5	42	0	0	368
6:45	120	19	15	32	0	0	186	18:45	321	12	7	38	0	0	378
7:00	131	17	15	47	0	0	210	19:00	173	14	8	29	0	0	224
7:15	128	19	16	25	0	0	188	19:15	166	9	1	19	0	0	195
7:30	150	19	12	36	0	0	217	19:30	125	8	3	16	0	0	152
7:45	161	19	16	36	0	0	232	19:45	121	5	3	22	0	0	151
8:00	122	23	15	42	0	1	203	20:00	128	10	1	19	0	0	158
8:15	146	28	11	61	0	1	247	20:15	118	7	8	28	0	0	161
8:30	180	28	33	51	0	0	292	20:30	106	12	6	27	1	0	152
8:45	164	37	25	52	0	0	278	20:45	101	4	6	26	0	0	137
9:00	149	49	20	51	0	1	270	21:00	91	6	5	28	0	0	130
9:15	148	44	6	69	0	1	268	21:15	80	4	6	23	0	0	113
9:30	174	40	15	48	1	2	280	21:30	83	4	2	30	0	0	119
9:45	139	23	13	58	1	0	234	21:45	91	4	6	19	0	0	120
10:00	140	39	14	52	0	0	245	22:00	119	4	4	25	0	0	152
10:15	127	31	18	42	0	0	218	22:15	119	0	2	28	0	0	149
10:30	149	30	13	53	0	1	246	22:30	128	4	2	19	0	0	153
10:45	165	28	13	46	0	1	253	22:45	115	1	3	28	0	1	148
11:00	163	25	17	48	1	1	255	23:00	99	2	7	20	0	0	128
11:15	167	37	8	55	0	1	268	23:15	77	2	5	19	0	0	103
11:30	157	27	5	56	0	0	245	23:30	63	1	2	19	0	0	85
11:45	148	21	20	51	1	1	242	23:45	49	6	1	22	0	0	78
TOTAL	4,779	719	424	1,806	4	11	7,743	TOTAL	10,226	675	365	1,465	3	16	12,750

AM PEAK HOUR	8:30 AM	AM PEAK HOUR	4:30 PM
AM PEAK VOLUME	1,108	AM PEAK VOLUME	1,736

			1	2	3	4	5	6	TOTAL
CLASS 1	PASSENGER VEHICLES	TOTAL: AM+PM	15,005	1,394	789	3,271	7	27	20,493
CLASS 2	2-AXLE TRUCKS	% OF TOTAL	73.2%	6.8%	3.9%	16.0%	0.0%	0.1%	100.0%
CLASS 3	3-AXLE TRUCKS								
CLASS 4	4 OR MORE AXLE TRUCKS								
CLASS 5	RV	TOTAL: ALL	31,784	2,897	1,621	6,257	12	55	42,626
CLASS 6	Buses	% OF TOTAL	74.6%	6.8%	3.8%	14.7%	0.0%	0.1%	100.0%

24-HOUR ROADWAY SEGMENT COUNTS (WITH CLASSIFICATION)
Prepared by AimTD LLC tel. 714 253 7888 cs@aimtd.com

DATE: Tuesday, June 05, 2018
JOB #: SC
CITY: Rialto
LOCATION: South Riverside between I-10 EB Ramps and Slover

AM TIME	1	2	3	4	5	6	TOTAL	PM Time	1	2	3	4	5	6	TOTAL
0:00	37	0	6	29	0	0	72	12:00	147	24	15	41	0	0	227
0:15	51	3	4	31	0	0	89	12:15	204	31	14	44	0	0	293
0:30	33	1	4	47	0	0	85	12:30	236	16	16	47	0	3	318
0:45	34	1	1	28	0	0	64	12:45	215	27	21	40	0	1	304
1:00	27	1	4	22	0	0	54	13:00	202	22	12	42	0	1	279
1:15	27	0	1	26	0	0	54	13:15	198	20	19	44	0	0	281
1:30	39	0	2	24	0	0	65	13:30	242	25	11	44	0	0	322
1:45	54	1	3	18	0	0	76	13:45	231	20	9	38	0	0	298
2:00	45	2	4	21	0	0	72	14:00	196	30	15	34	0	1	276
2:15	46	0	2	28	0	0	76	14:15	216	30	19	39	0	1	305
2:30	55	3	4	20	0	0	82	14:30	219	26	14	39	0	0	298
2:45	77	1	2	28	0	0	108	14:45	242	28	14	39	0	1	324
3:00	58	7	4	33	0	0	102	15:00	239	30	11	44	0	1	325
3:15	86	3	1	27	0	0	117	15:15	218	34	17	26	0	0	295
3:30	149	8	1	27	0	0	185	15:30	268	29	15	40	0	1	353
3:45	157	3	3	21	0	0	184	15:45	236	32	12	26	0	0	306
4:00	131	7	4	18	0	0	160	16:00	207	25	13	38	0	0	283
4:15	147	4	4	18	0	0	173	16:15	247	24	14	12	0	0	297
4:30	184	7	2	27	0	0	220	16:30	301	30	14	31	1	0	377
4:45	236	8	6	27	0	0	277	16:45	259	29	9	22	1	0	320
5:00	189	11	1	24	0	0	225	17:00	213	18	6	24	0	0	261
5:15	274	11	5	18	0	0	308	17:15	257	17	6	21	1	0	302
5:30	413	18	0	22	0	0	453	17:30	263	19	7	23	0	0	312
5:45	391	20	5	25	0	0	441	17:45	284	23	5	32	0	0	344
6:00	287	14	9	27	1	0	338	18:00	252	17	8	36	0	0	313
6:15	312	23	5	31	0	1	372	18:15	251	27	5	32	0	0	315
6:30	350	23	6	34	0	0	413	18:30	238	18	11	31	0	1	299
6:45	391	25	14	31	0	0	461	18:45	205	15	14	39	0	0	273
7:00	298	35	16	36	0	4	389	19:00	128	8	5	31	0	0	172
7:15	316	21	13	25	0	0	375	19:15	119	12	3	39	0	0	173
7:30	392	21	10	25	0	0	448	19:30	111	4	4	26	0	0	145
7:45	334	16	9	34	0	0	393	19:45	117	4	7	38	0	0	166
8:00	266	32	19	38	0	1	356	20:00	103	8	4	21	0	0	136
8:15	215	19	17	29	0	0	280	20:15	112	8	5	24	0	0	149
8:30	162	13	19	33	0	0	227	20:30	112	4	9	37	0	0	162
8:45	156	19	10	28	0	2	215	20:45	118	4	6	33	0	0	161
9:00	133	23	5	29	0	2	192	21:00	105	1	8	20	0	0	134
9:15	148	31	23	37	0	0	239	21:15	106	2	4	21	0	0	133
9:30	156	17	16	42	1	1	233	21:30	115	4	3	23	0	0	145
9:45	163	25	11	35	0	0	234	21:45	121	4	8	24	0	0	157
10:00	152	34	7	39	0	0	232	22:00	81	2	6	28	0	0	117
10:15	148	31	14	44	0	0	237	22:15	108	4	5	21	0	0	138
10:30	166	36	11	47	0	0	260	22:30	136	3	4	27	0	1	171
10:45	176	28	17	42	0	0	263	22:45	105	1	4	29	0	0	139
11:00	143	34	14	47	0	0	238	23:00	66	1	4	36	0	0	107
11:15	137	26	17	50	0	1	231	23:15	52	0	8	20	0	0	80
11:30	159	42	17	43	0	3	264	23:30	58	0	3	32	0	0	93
11:45	170	34	13	29	0	1	247	23:45	50	1	1	24	0	0	76
TOTAL	8,270	742	385	1,464	2	16	10,879	TOTAL	8,509	761	447	1,522	3	12	11,254

AM PEAK HOUR	6:45 AM
AM PEAK VOLUME	1,673

AM PEAK HOUR	2:45 PM
AM PEAK VOLUME	1,297

	1	2	3	4	5	6	TOTAL
TOTAL: AM+PM	16,779	1,503	832	2,986	5	28	22,133
% OF TOTAL	75.8%	6.8%	3.8%	13.5%	0.0%	0.1%	100.0%

CLASS 1	PASSENGER VEHICLES
CLASS 2	2-AXLE TRUCKS
CLASS 3	3-AXLE TRUCKS
CLASS 4	4 OR MORE AXLE TRUCKS
CLASS 5	RV
CLASS 6	BUS

Prepared by NDS/ATD

VOLUME

S Riverside Ave Bet. Slover Ave & Santa Ana Ave

Day: Thursday
Date: 5/10/2018

City: Bloomington
Project #: CA18_6066_037

DAILY TOTALS	NB	SB	EB	WB	Total
	22,640	23,113	0	0	45,753

AM Period	NB		SB		EB	WB	TOTAL	
00:00	132		87				219	
00:15	115		73				188	
00:30	145		82				227	
00:45	108	500	117	359			225	859
01:00	95		95				190	
01:15	107		84				191	
01:30	138		91				229	
01:45	79	419	84	354			163	773
02:00	92		81				173	
02:15	93		105				198	
02:30	116		115				231	
02:45	99	400	96	397			195	797
03:00	113		96				209	
03:15	138		141				279	
03:30	140		185				325	
03:45	133	524	202	624			335	1148
04:00	184		146				330	
04:15	172		148				320	
04:30	170		197				367	
04:45	170	696	252	743			422	1439
05:00	132		213				345	
05:15	151		232				383	
05:30	175		333				508	
05:45	198	656	354	1132			552	1788
06:00	189		314				503	
06:15	210		262				472	
06:30	279		321				600	
06:45	255	933	366	1263			621	2196
07:00	281		357				638	
07:15	264		332				596	
07:30	295		284				579	
07:45	297	1137	345	1318			642	2455
08:00	260		333				593	
08:15	292		315				607	
08:30	314		331				645	
08:45	287	1153	280	1259			567	2412
09:00	304		271				575	
09:15	264		299				563	
09:30	327		248				575	
09:45	304	1199	285	1103			589	2302
10:00	334		240				574	
10:15	298		293				591	
10:30	321		288				609	
10:45	312	1265	281	1102			593	2367
11:00	244		267				511	
11:15	323		273				596	
11:30	306		315				621	
11:45	270	1143	309	1164			579	2307
TOTALS	10025		10818					20843
SPLIT %	48.1%		51.9%					45.6%

PM Period	NB		SB		EB	WB	TOTAL	
12:00	331		337				668	
12:15	334		339				673	
12:30	248		424				672	
12:45	311	1224	381	1481			692	2705
13:00	300		307				607	
13:15	266		292				558	
13:30	344		355				699	
13:45	352	1262	377	1331			729	2593
14:00	347		355				702	
14:15	318		373				691	
14:30	415		340				755	
14:45	399	1479	362	1430			761	2909
15:00	383		360				743	
15:15	387		372				759	
15:30	357		384				741	
15:45	375	1502	365	1481			740	2983
16:00	363		334				697	
16:15	248		335				583	
16:30	338		342				680	
16:45	295	1244	330	1341			625	2585
17:00	280		311				591	
17:15	299		355				654	
17:30	354		375				729	
17:45	332	1265	340	1381			672	2646
18:00	293		266				559	
18:15	290		234				524	
18:30	225		232				457	
18:45	271	1079	204	936			475	2015
19:00	225		190				415	
19:15	184		176				360	
19:30	191		151				342	
19:45	213	813	166	683			379	1496
20:00	217		171				388	
20:15	221		146				367	
20:30	208		149				357	
20:45	163	809	147	613			310	1422
21:00	146		126				272	
21:15	172		134				306	
21:30	221		143				364	
21:45	160	699	166	569			326	1268
22:00	136		152				288	
22:15	176		132				308	
22:30	180		132				312	
22:45	172	664	119	535			291	1199
23:00	217		165				382	
23:15	136		127				263	
23:30	106		115				221	
23:45	116	575	107	514			223	1089
TOTALS	12615		12295					24910
SPLIT %	50.6%		49.4%					54.4%

DAILY TOTALS	NB	SB	EB	WB	Total
	22,640	23,113	0	0	45,753

	NB	SB	EB	WB	TOTAL
AM Peak Hour	10:00	11:45			11:45
AM Pk Volume	1265	1409			2592
Pk Hr Factor	0.947	0.831			0.963
7 - 9 Volume	2290	2577	0	0	4867
7 - 9 Peak Hour	07:45	07:45			07:45
7 - 9 Pk Volume	1163	1324	0	0	2487
Pk Hr Factor	0.926	0.959	0.000	0.000	0.964

	NB	SB	EB	WB	TOTAL
PM Peak Hour	14:30	12:00			14:30
PM Pk Volume	1584	1481			3018
Pk Hr Factor	0.954	0.873			0.991
4 - 6 Volume	2509	2722	0	0	5231
4 - 6 Peak Hour	17:00	17:00			17:00
4 - 6 Pk Volume	1265	1381	0	0	2646
Pk Hr Factor	0.893	0.921	0.000	0.000	0.907

Prepared by NDS/ATD

VOLUME

S Riverside Ave Bet. Slover Ave & Santa Ana Ave

Day: Saturday
Date: 5/12/2018

City: Bloomington
Project #: CA18_6066_037

DAILY TOTALS	NB	SB	EB	WB	Total
	14,971	12,954	0	0	27,925

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	152		113				265		12:00	227		146				373	
00:15	156		91				247		12:15	244		187				431	
00:30	130		91				221		12:30	243		198				441	
00:45	83	521	94	389			177	910	12:45	250	964	169	700			419	1664
01:00	112		67				179		13:00	211		184				395	
01:15	111		83				194		13:15	206		202				408	
01:30	123		76				199		13:30	220		182				402	
01:45	109	455	77	303			186	758	13:45	213	850	215	783			428	1633
02:00	107		88				195		14:00	183		218				401	
02:15	115		71				186		14:15	196		191				387	
02:30	73		56				129		14:30	258		192				450	
02:45	93	388	69	284			162	672	14:45	212	849	187	788			399	1637
03:00	106		47				153		15:00	191		185				376	
03:15	107		101				208		15:15	208		154				362	
03:30	114		144				258		15:30	167		179				346	
03:45	75	402	146	438			221	840	15:45	197	763	201	719			398	1482
04:00	159		96				255		16:00	223		177				400	
04:15	122		107				229		16:15	223		143				366	
04:30	118		135				253		16:30	180		145				325	
04:45	110	509	139	477			249	986	16:45	139	765	164	629			303	1394
05:00	123		91				214		17:00	176		163				339	
05:15	92		119				211		17:15	181		136				317	
05:30	137		128				265		17:30	205		147				352	
05:45	126	478	155	493			281	971	17:45	155	717	170	616			325	1333
06:00	112		110				222		18:00	177		147				324	
06:15	108		133				241		18:15	188		126				314	
06:30	151		141				292		18:30	135		135				270	
06:45	128	499	166	550			294	1049	18:45	158	658	113	521			271	1179
07:00	103		134				237		19:00	163		113				276	
07:15	148		134				282		19:15	131		133				264	
07:30	161		170				331		19:30	126		104				230	
07:45	181	593	179	617			360	1210	19:45	114	534	103	453			217	987
08:00	198		114				312		20:00	126		97				223	
08:15	164		153				317		20:15	123		124				247	
08:30	199		145				344		20:30	117		108				225	
08:45	172	733	166	578			338	1311	20:45	94	460	80	409			174	869
09:00	176		156				332		21:00	107		103				210	
09:15	212		143				355		21:15	127		83				210	
09:30	200		187				387		21:30	96		93				189	
09:45	205	793	169	655			374	1448	21:45	96	426	120	399			216	825
10:00	215		174				389		22:00	105		102				207	
10:15	238		214				452		22:15	115		111				226	
10:30	230		145				375		22:30	147		98				245	
10:45	235	918	161	694			396	1612	22:45	117	484	106	417			223	901
11:00	196		174				370		23:00	111		85				196	
11:15	205		152				357		23:15	96		107				203	
11:30	188		190				378		23:30	119		81				200	
11:45	207	796	184	700			391	1496	23:45	90	416	69	342			159	758
TOTALS		7085		6178				13263	TOTALS		7886		6776				14662
SPLIT %		53.4%		46.6%				47.5%	SPLIT %		53.8%		46.2%				52.5%

DAILY TOTALS	NB	SB	EB	WB	Total
	14,971	12,954	0	0	27,925

	NB	SB	EB	WB	TOTAL		NB	SB	EB	WB	TOTAL
AM Peak Hour	11:45	09:30			11:45	PM Peak Hour	12:00	13:15			12:15
AM Pk Volume	921	744			1636	PM Pk Volume	964	817			1686
Pk Hr Factor	0.944	0.869			0.927	Pk Hr Factor	0.964	0.937			0.956
7 - 9 Volume	1326	1195	0	0	2521	4 - 6 Volume	1482	1245	0	0	2727
7 - 9 Peak Hour	07:45	07:00			07:45	4 - 6 Peak Hour	16:00	16:00			16:00
7 - 9 Pk Volume	742	617	0	0	1333	4 - 6 Pk Volume	765	629	0	0	1394
Pk Hr Factor	0.932	0.862	0.000	0.000	0.926	Pk Hr Factor	0.858	0.888	0.000	0.000	0.871

Appendix E – PCE Calculations

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE: 2/12/20 WEDNESDAY	LOCATION:	Rialto	PROJECT #:	SC2522
	NORTH & SOUTH:	Riverside	LOCATION #:	1
	EAST & WEST:	Valley	CONTROL:	SIGNAL

PCE Adjusted	NOTES:								
	Class	1	2	3	4	5	6		
	Factor	1	1.5	2	3	2	2		

AM / PM / MD / OTHER / OTHER

▲ N / ◄ W / E ► / S ▼

	NORTHBOUND (Riverside)			SOUTHBOUND (Riverside)			EASTBOUND (Valley)			WESTBOUND (Valley)			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	2	2.5	0.5	1	2.5	0.5	1	2	1	1	2	1	
AM													
7:00 AM	73	147	36	17	286	8	5	51	130	41	49	12	853
7:15 AM	100	160	19	14	267	6	11	32	154	61	36	4	861
7:30 AM	90	164	42	12	326	7	8	51	142	44	51	13	948
7:45 AM	94	158	63	19	270	8	13	52	123	34	35	8	875
8:00 AM	64	146	52	10	264	17	10	77	125	34	36	16	849
8:15 AM	73	148	58	19	211	8	15	38	95	48	55	13	779
8:30 AM	76	164	55	14	202	14	16	45	106	34	37	22	783
8:45 AM	85	198	44	9	180	12	11	37	91	46	31	14	756
VOLUMES	654	1,282	368	114	2,004	80	89	381	965	340	328	101	6,703
APPROACH %	28%	56%	16%	5%	91%	4%	6%	27%	67%	44%	43%	13%	
APP/DEPART	2,303	/	1,472	2,197	/	3,309	1,434	/	862	769	/	1,061	0
BEGIN PEAK HR		7:00 AM											
VOLUMES	357	628	160	62	1,148	29	37	185	548	179	170	37	3,537
APPROACH %	31%	55%	14%	5%	93%	2%	5%	24%	71%	46%	44%	9%	
PEAK HR FACTOR		0.910			0.898			0.959			0.904		0.933
APP/DEPART	1,145	/	701	1,238	/	1,875	769	/	406	385	/	555	0
PM													
4:00 PM	142	373	54	21	206	13	13	70	125	44	89	29	1,178
4:15 PM	130	295	38	19	209	13	22	69	114	46	52	29	1,034
4:30 PM	105	347	54	16	195	6	21	63	130	35	60	32	1,062
4:45 PM	135	311	41	23	202	15	25	64	126	54	80	29	1,103
5:00 PM	140	313	80	16	195	12	23	64	130	50	73	39	1,133
5:15 PM	148	319	34	22	169	9	14	78	133	50	93	32	1,100
5:30 PM	148	341	46	23	233	21	32	58	115	49	69	31	1,162
5:45 PM	131	286	36	21	189	17	25	53	98	37	59	24	974
VOLUMES	1,078	2,584	382	160	1,597	105	175	517	969	363	572	244	8,745
APPROACH %	27%	64%	9%	9%	86%	6%	11%	31%	58%	31%	49%	21%	
APP/DEPART	4,044	/	3,002	1,862	/	2,929	1,661	/	1,059	1,179	/	1,755	0
BEGIN PEAK HR		4:45 PM											
VOLUMES	570	1,284	200	84	799	57	94	264	503	202	314	130	4,497
APPROACH %	28%	63%	10%	9%	85%	6%	11%	31%	58%	31%	49%	20%	
PEAK HR FACTOR		0.960			0.849			0.955			0.922		0.968
APP/DEPART	2,053	/	1,507	939	/	1,503	860	/	548	646	/	940	0

U-TURNS

	NB	SB	EB	WB	TTL
7:00 AM					0
7:15 AM					0
7:30 AM					0
7:45 AM					0
8:00 AM					0
8:15 AM					0
8:30 AM					0
8:45 AM					0
VOLUMES	0	0	0	0	0
4:00 PM					0
4:15 PM					0
4:30 PM					0
4:45 PM					0
5:00 PM					0
5:15 PM					0
5:30 PM					0
5:45 PM					0
VOLUMES	0	0	0	0	0

Riverside

NORTH SIDE

Valley WEST SIDE

EAST SIDE **Valley**

SOUTH SIDE

Riverside

Approach	AM Peak Hour (7:00-8:00am)									PM Peak Hour (5:00-6:00pm)								
	Passenger Vehicles	Truck Volumes 2-axle 1.5	3-axle 2.0	4-axle 3.0	Total Trucks	Truck %	PCE	Average PCE	**Total PCE Volume**	Passenger Vehicles	Truck Volumes 2-axle 1.5	3-axle 2.0	4-axle 3.0	Total Trucks	Truck %	PCE	Average PCE	**Total PCE Volume**
SBL	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
SBT	972	18	2	5	25	2.5%	46	1.8	**1018**	1044	10	8	10	28	2.6%	61	2.2	**1105**
SBR	507	5	0	6	11	2.1%	26	2.4	**533**	369	3	3	2	8	2.1%	17	2.1	**386**
SBU	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
NBL	55	18	17	58	93	62.8%	235	2.5	**290**	173	2	10	35	47	21.4%	128	2.7	**301**
NBT	769	23	4	24	51	6.2%	115	2.3	**884**	1459	15	6	8	29	1.9%	59	2.0	**1518**
NBR	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
NBU	13	0	0	0	0	0.0%	0	0.0	**13**	0	0	0	0	0	0.0%	0	0.0	**0**
EBL	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
EBT	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
EBR	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
EBU	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
WBL	350	19	7	44	70	16.7%	175	2.5	**525**	380	13	12	59	84	18.1%	221	2.6	**601**
WBT	5	0	0	0	0	0.0%	0	0.0	**5**	3	0	0	0	0	0.0%	0	0.0	**3**
WBR	337	11	0	2	13	3.7%	23	1.8	**360**	459	4	1	5	10	2.1%	23	2.3	**482**
WBU	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
North Approach Volumes																		
Entering	1479	23	2	11	36	2.4%	72	2.0	**1551**	1413	13	11	12	36	2.5%	78	2.2	**1491**
Exiting	1106	34	4	26	64	5.5%	137	2.1	**1243**	1918	19	7	13	39	2.0%	82	2.1	**2000**
Total	2585	57	6	37	100	3.7%	209	2.1	**2794**	3331	32	18	25	75	2.2%	159	2.1	**3490**
South Approach Volumes																		
Entering	837	41	21	82	144	14.7%	350	2.4	**1187**	1632	17	16	43	76	4.4%	187	2.5	**1819**
Exiting	1335	37	9	49	95	6.6%	221	2.3	**1556**	1424	23	20	69	112	7.3%	282	2.5	**1706**
Total	2172	78	30	131	239	9.9%	570	2.4	**2742**	3056	40	36	112	188	5.8%	468	2.5	**3524**
West Approach Volumes																		
Entering	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
Exiting	567	23	17	64	104	15.5%	261	2.5	**828**	545	5	13	37	55	9.2%	145	2.6	**690**
Total	567	23	17	64	104	15.5%	261	2.5	**828**	545	5	13	37	55	9.2%	145	2.6	**690**
East Approach Volumes																		
Entering	692	30	7	46	83	10.7%	197	2.4	**889**	842	17	13	64	94	10.0%	244	2.6	**1086**
Exiting	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
Total	692	30	7	46	83	10.7%	197	2.4	**889**	842	17	13	64	94	10.0%	244	2.6	**1086**
Total Approach Volumes																		
Entering	3008	94	30	139	263	8.0%	618	2.3	**3626**	3887	47	40	119	206	5.0%	508	2.5	**4395**
Exiting	3008	94	30	139	263	8.0%	618	2.3	**3626**	3887	47	40	119	206	5.0%	508	2.5	**4395**
Total	6016	188	60	278	526	8.0%	1236	2.3	**7252**	7774	94	80	238	412	5.0%	1015	2.5	**8789**

Approach	AM Peak Hour (7:00-8:00am) Passenger Vehicles	AM Truck Volumes 2-axle 1.5	AM Truck Volumes 3-axle 2.0	AM Truck Volumes 4-axle 3.0	AM Truck Volumes Total Trucks	AM Truck %	AM PCE	AM Average PCE	AM Total PCE Volume	PM Peak Hour (5:00-6:00pm) Passenger Vehicles	PM Truck Volumes 2-axle 1.5	PM Truck Volumes 3-axle 2.0	PM Truck Volumes 4-axle 3.0	PM Truck Volumes Total Trucks	PM Truck %	PM PCE	PM Average PCE	PM Total PCE Volume
SBL	362	8	1	2	11	2.9%	20	1.8	**382**	431	2	0	3	5	1.1%	12	2.4	**443**
SBT	963	27	10	46	83	7.9%	199	2.4	**1162**	1015	21	20	66	107	9.5%	270	2.5	**1285**
SBR	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
SBU	2	0	0	0	0	0.0%	0	0.0	**2**	1	0	0	0	0	0.0%	0	0.0	**1**
NBL	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
NBT	534	34	20	79	133	19.9%	328	2.5	**862**	1103	13	15	39	67	5.7%	167	2.5	**1270**
NBR	195	12	10	51	73	27.2%	191	2.6	**386**	427	9	10	45	64	13.0%	169	2.6	**596**
NBU	1	0	0	0	0	0.0%	0	0.0	**1**	0	0	0	0	0	0.0%	0	0.0	**0**
EBL	299	9	2	2	13	4.2%	24	1.8	**323**	558	2	2	2	6	1.1%	13	2.2	**571**
EBT	5	2	0	0	2	28.6%	3	1.5	**8**	0	0	0	0	0	0.0%	0	0.0	**0**
EBR	246	11	10	56	77	23.8%	205	2.7	**451**	231	7	18	50	75	24.5%	197	2.6	**428**
EBU	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
WBL	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
WBT	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
WBR	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
WBU	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
North Approach Volumes																		
Entering	1327	35	11	48	94	6.6%	219	2.3	**1546**	1447	23	20	69	112	7.2%	282	2.5	**1729**
Exiting	835	43	22	81	146	14.9%	352	2.4	**1187**	1662	15	17	41	73	4.2%	180	2.5	**1842**
Total	2162	78	33	129	240	10.0%	570	2.4	**2732**	3109	38	37	110	185	5.6%	461	2.5	**3570**
South Approach Volumes																		
Entering	730	46	30	130	206	22.0%	519	2.5	**1249**	1530	22	25	84	131	7.9%	335	2.6	**1865**
Exiting	1210	38	20	102	160	11.7%	403	2.5	**1613**	1246	28	38	116	182	12.7%	466	2.6	**1712**
Total	1940	84	50	232	366	15.9%	922	2.5	**2862**	2776	50	63	200	313	10.1%	801	2.6	**3577**
West Approach Volumes																		
Entering	550	22	12	58	92	14.3%	231	2.5	**781**	789	9	20	52	81	9.3%	210	2.6	**999**
Exiting	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
Total	550	22	12	58	92	14.3%	231	2.5	**781**	789	9	20	52	81	9.3%	210	2.6	**999**
East Approach Volumes																		
Entering	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
Exiting	562	22	11	53	86	13.3%	214	2.5	**776**	858	11	10	48	69	7.4%	181	2.6	**1039**
Total	562	22	11	53	86	13.3%	214	2.5	**776**	858	11	10	48	69	7.4%	181	2.6	**1039**
Total Approach Volumes																		
Entering	2607	103	53	236	392	13.1%	969	2.5	**3576**	3766	54	65	205	324	7.9%	826	2.5	**4592**
Exiting	2607	103	53	236	392	13.1%	969	2.5	**3576**	3766	54	65	205	324	7.9%	826	2.5	**4592**
Total	5214	206	106	472	784	13.1%	1937	2.5	**7151**	7532	108	130	410	648	7.9%	1652	2.5	**9184**

Approach	AM Peak Hour (7:00-8:00am) Passenger Vehicles	AM Truck Volumes 2-axle 1.5	AM Truck Volumes 3-axle 2.0	AM Truck Volumes 4-axle 3.0	AM Truck Volumes Total Trucks	AM Truck %	AM PCE	AM Average PCE	AM Total PCE Volume	PM Peak Hour (5:00-6:00pm) Passenger Vehicles	PM Truck Volumes 2-axle 1.5	PM Truck Volumes 3-axle 2.0	PM Truck Volumes 4-axle 3.0	PM Truck Volumes Total Trucks	PM Truck %	PM PCE	PM Average PCE	PM Total PCE Volume
SBL	19	3	3	2	8	29.6%	17	2.1	**36**	5	3	2	4	9	64.3%	21	2.3	**26**
SBT	828	27	16	84	127	13.3%	325	2.6	**1153**	1035	23	31	92	146	12.4%	373	2.6	**1408**
SBR	348	11	1	15	27	7.2%	64	2.4	**412**	194	6	6	20	32	14.2%	81	2.5	**275**
SBU	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
NBL	48	3	3	7	13	21.3%	32	2.5	**80**	17	2	1	2	5	22.7%	11	2.2	**28**
NBT	471	36	22	113	171	26.6%	437	2.6	**908**	1066	15	19	71	105	9.0%	274	2.6	**1340**
NBR	8	1	1	5	7	46.7%	19	2.7	**27**	10	0	1	3	4	28.6%	11	2.8	**21**
NBU	1	0	0	0	0	0.0%	0	0.0	**1**	6	0	0	0	0	0.0%	0	0.0	**6**
EBL	208	8	4	6	18	8.0%	38	2.1	**246**	361	6	5	6	17	4.5%	37	2.2	**398**
EBT	16	2	0	0	2	11.1%	3	1.5	**19**	102	2	0	3	5	4.7%	12	2.4	**114**
EBR	20	3	8	9	20	50.0%	48	2.4	**68**	97	2	5	11	18	15.7%	46	2.6	**143**
EBU	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
WBL	12	3	1	3	7	36.8%	16	2.3	**28**	4	1	4	6	11	73.3%	28	2.5	**32**
WBT	17	1	1	2	4	19.0%	10	2.5	**27**	4	2	2	6	10	71.4%	25	2.5	**29**
WBR	14	2	3	2	7	33.3%	15	2.1	**29**	50	1	0	6	7	12.3%	20	2.9	**70**
WBU	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
North Approach Volumes																		
Entering	1195	41	20	101	162	11.9%	405	2.5	**1600**	1234	32	39	116	187	13.2%	474	2.5	**1708**
Exiting	693	46	29	121	196	22.0%	490	2.5	**1183**	1477	22	24	83	129	8.0%	330	2.6	**1807**
Total	1888	87	49	222	358	15.9%	895	2.5	**2783**	2711	54	63	199	316	10.4%	804	2.5	**3515**
South Approach Volumes																		
Entering	528	40	26	125	191	26.6%	487	2.5	**1015**	1099	17	21	76	114	9.4%	296	2.6	**1395**
Exiting	861	33	25	96	154	15.2%	388	2.5	**1249**	1142	26	40	109	175	13.3%	446	2.5	**1588**
Total	1389	73	51	221	345	19.9%	875	2.5	**2264**	2241	43	61	185	289	11.4%	742	2.6	**2983**
West Approach Volumes																		
Entering	244	13	12	15	40	14.1%	89	2.2	**333**	560	10	10	20	40	6.7%	95	2.4	**655**
Exiting	413	15	5	24	44	9.6%	105	2.4	**518**	215	10	9	28	47	17.9%	117	2.5	**332**
Total	657	28	17	39	84	11.3%	193	2.3	**850**	775	20	19	48	87	10.1%	212	2.4	**987**
East Approach Volumes																		
Entering	43	6	5	7	18	29.5%	40	2.2	**83**	58	4	6	18	28	32.6%	72	2.6	**130**
Exiting	43	6	4	7	17	28.3%	38	2.2	**81**	117	5	3	10	18	13.3%	44	2.4	**161**
Total	86	12	9	14	35	28.9%	78	2.2	**164**	175	9	9	28	46	20.8%	116	2.5	**291**
Total Approach Volumes																		
Entering	2010	100	63	248	411	17.0%	1020	2.5	**3030**	2951	63	76	230	369	11.1%	937	2.5	**3888**
Exiting	2010	100	63	248	411	17.0%	1020	2.5	**3030**	2951	63	76	230	369	11.1%	937	2.5	**3888**
Total	4020	200	126	496	822	17.0%	2040	2.5	**6060**	5902	126	152	460	738	11.1%	1873	2.5	**7775**

Approach	AM Peak Hour (7:00-8:00am)									PM Peak Hour (5:00-6:00pm)								
	Passenger Vehicles	Truck Volumes						Average PCE	**Total PCE Volume**	Passenger Vehicles	Truck Volumes						Average PCE	**Total PCE Volume**
		2-axle 1.5	3-axle 2.0	4-axle 3.0	Total Trucks	Truck %	PCE				2-axle 1.5	3-axle 2.0	4-axle 3.0	Total Trucks	Truck %	PCE		
SBL	22	2	1	11	14	38.9%	38	2.7	**60**	14	3	5	8	16	53.3%	39	2.4	**53**
SBT	749	32	15	73	120	13.8%	297	2.5	**1046**	1076	21	35	90	146	11.9%	372	2.5	**1448**
SBR	88	4	2	8	14	13.7%	34	2.4	**122**	61	4	1	2	7	10.3%	14	2.0	**75**
SBU	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
NBL	65	6	2	1	9	12.2%	16	1.8	**81**	63	1	1	5	7	10.0%	19	2.7	**82**
NBT	523	31	20	95	146	21.8%	372	2.5	**895**	952	14	20	63	97	9.2%	250	2.6	**1202**
NBR	6	0	2	7	9	60.0%	25	2.8	**31**	4	0	1	4	5	55.6%	14	2.8	**18**
NBU	1	0	0	0	0	0.0%	0	0.0	**1**	0	0	0	0	0	0.0%	0	0.0	**0**
EBL	37	4	2	5	11	22.9%	25	2.3	**62**	78	0	2	7	9	10.3%	25	2.8	**103**
EBT	3	2	18	3	23	88.5%	48	2.1	**51**	7	0	2	1	3	30.0%	7	2.3	**14**
EBR	41	0	1	5	6	12.8%	17	2.8	**58**	63	0	3	7	10	13.7%	27	2.7	**90**
EBU	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
WBL	3	0	6	6	12	80.0%	30	2.5	**33**	18	0	5	3	8	30.8%	19	2.4	**37**
WBT	2	0	1	14	15	88.2%	44	2.9	**46**	11	1	1	1	3	21.4%	7	2.3	**18**
WBR	4	4	4	21	29	87.9%	77	2.7	**81**	46	1	1	4	6	11.5%	16	2.7	**62**
WBU	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
North Approach Volumes																		
Entering	859	38	18	92	148	14.7%	369	2.5	**1228**	1151	28	41	100	169	12.8%	424	2.5	**1575**
Exiting	564	39	26	121	186	24.8%	474	2.5	**1038**	1076	15	23	74	112	9.4%	291	2.6	**1367**
Total	1423	77	44	213	334	19.0%	843	2.5	**2266**	2227	43	64	174	281	11.2%	715	2.5	**2942**
South Approach Volumes																		
Entering	595	37	24	103	164	21.6%	413	2.5	**1008**	1019	15	22	72	109	9.7%	283	2.6	**1302**
Exiting	794	32	22	84	138	14.8%	344	2.5	**1138**	1157	21	43	100	164	12.4%	418	2.5	**1575**
Total	1389	69	46	187	302	17.9%	757	2.5	**2146**	2176	36	65	172	273	11.1%	700	2.6	**2876**
West Approach Volumes																		
Entering	81	6	21	13	40	33.1%	90	2.3	**171**	148	0	7	15	22	12.9%	59	2.7	**207**
Exiting	155	10	5	23	38	19.7%	94	2.5	**249**	135	6	3	8	17	11.2%	39	2.3	**174**
Total	236	16	26	36	78	24.8%	184	2.4	**420**	283	6	10	23	39	12.1%	98	2.5	**381**
East Approach Volumes																		
Entering	9	4	11	41	56	86.2%	151	2.7	**160**	75	2	7	8	17	18.5%	41	2.4	**116**
Exiting	31	4	21	21	46	59.7%	111	2.4	**142**	25	3	8	13	24	49.0%	60	2.5	**85**
Total	40	8	32	62	102	71.8%	262	2.6	**302**	100	5	15	21	41	29.1%	101	2.5	**201**
Total Approach Volumes																		
Entering	1544	85	74	249	408	20.9%	1023	2.5	**2567**	2393	45	77	195	317	11.7%	807	2.5	**3200**
Exiting	1544	85	74	249	408	20.9%	1023	2.5	**2567**	2393	45	77	195	317	11.7%	807	2.5	**3200**
Total	3088	170	148	498	816	20.9%	2045	2.5	**5133**	4786	90	154	390	634	11.7%	1613	2.5	**6399**

Approach	AM Peak Hour (7:00-8:00am)									PM Peak Hour (5:00-6:00pm)								
	Passenger Vehicles	Truck Volumes						Average PCE	**Total PCE Volume**	Passenger Vehicles	Truck Volumes						Average PCE	**Total PCE Volume**
		2-axle 1.5	3-axle 2.0	4-axle 3.0	Total Trucks	Truck %	PCE				2-axle 1.5	3-axle 2.0	4-axle 3.0	Total Trucks	Truck %	PCE		
SBL	16	0	1	8	9	36.0%	26	2.9	**42**	9	0	2	7	9	50.0%	25	2.8	**34**
SBT	753	29	22	76	127	14.4%	316	2.5	**1069**	1174	21	39	94	154	11.6%	392	2.5	**1566**
SBR	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
SBU	0	0	0	0	0	0.0%	0	0.0	**0**	1	0	0	0	0	0.0%	0	0.0	**1**
NBL	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
NBT	582	32	24	91	147	20.2%	369	2.5	**951**	949	17	19	62	98	9.4%	250	2.6	**1199**
NBR	4	0	0	1	1	20.0%	3	3.0	**7**	6	0	0	1	1	14.3%	3	3.0	**9**
NBU	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
EBL	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
EBT	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
EBR	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
EBU	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
WBL	0	0	0	0	0	0.0%	0	0.0	**0**	3	0	0	0	0	0.0%	0	0.0	**3**
WBT	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
WBR	7	0	3	7	10	58.8%	27	2.7	**34**	14	0	4	4	8	36.4%	20	2.5	**34**
WBU	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
North Approach Volumes																		
Entering	769	29	23	84	136	15.0%	342	2.5	**1111**	1184	21	41	101	163	12.1%	417	2.6	**1601**
Exiting	589	32	27	98	157	21.0%	396	2.5	**985**	964	17	23	66	106	9.9%	270	2.5	**1234**
Total	1358	61	50	182	293	17.7%	738	2.5	**2096**	2148	38	64	167	269	11.1%	686	2.6	**2834**
South Approach Volumes																		
Entering	586	32	24	92	148	20.2%	372	2.5	**958**	955	17	19	63	99	9.4%	253	2.6	**1208**
Exiting	753	29	22	76	127	14.4%	316	2.5	**1069**	1177	21	39	94	154	11.6%	392	2.5	**1569**
Total	1339	61	46	168	275	17.0%	688	2.5	**2027**	2132	38	58	157	253	10.6%	644	2.5	**2776**
West Approach Volumes																		
Entering	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
Exiting	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
Total	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
East Approach Volumes																		
Entering	7	0	3	7	10	58.8%	27	2.7	**34**	17	0	4	4	8	32.0%	20	2.5	**37**
Exiting	20	0	1	9	10	33.3%	29	2.9	**49**	15	0	2	8	10	40.0%	28	2.8	**43**
Total	27	0	4	16	20	42.6%	56	2.8	**83**	32	0	6	12	18	36.0%	48	2.7	**80**
Total Approach Volumes																		
Entering	1362	61	50	183	294	17.8%	741	2.5	**2103**	2156	38	64	168	270	11.1%	689	2.6	**2845**
Exiting	1362	61	50	183	294	17.8%	741	2.5	**2103**	2156	38	64	168	270	11.1%	689	2.6	**2845**
Total	2724	122	100	366	588	17.8%	1481	2.5	**4205**	4312	76	128	336	540	11.1%	1378	2.6	**5690**

Approach	AM Peak Hour (7:00-8:00am)									PM Peak Hour (5:00-6:00pm)								
	Passenger Vehicles	Truck Volumes 2-axle 1.5	3-axle 2.0	4-axle 3.0	Total Trucks	Truck %	PCE	Average PCE	**Total PCE Volume**	Passenger Vehicles	Truck Volumes 2-axle 1.5	3-axle 2.0	4-axle 3.0	Total Trucks	Truck %	PCE	Average PCE	**Total PCE Volume**
SBL	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
SBT	632	28	31	104	163	20.5%	416	2.6	**1048**	1149	12	42	87	141	10.9%	363	2.6	**1512**
SBR	31	2	0	2	4	11.4%	9	2.3	**40**	39	4	0	2	6	13.3%	12	2.0	**51**
SBU	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
NBL	56	4	2	2	8	12.5%	16	2.0	**72**	68	1	3	6	10	12.8%	26	2.6	**94**
NBT	476	29	27	118	174	26.8%	452	2.6	**928**	935	13	17	58	88	8.6%	228	2.6	**1163**
NBR	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
NBU	0	0	0	0	0	0.0%	0	0.0	**0**	2	0	0	0	0	0.0%	0	0.0	**2**
EBL	35	3	3	3	9	20.5%	20	2.2	**55**	29	0	0	0	0	0.0%	0	0.0	**29**
EBT	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
EBR	57	15	6	13	34	37.4%	74	2.2	**131**	130	0	2	5	7	5.1%	19	2.7	**149**
EBU	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
WBL					0	0.0%	0	0.0	**0**					0	0.0%	0	0.0	**0**
WBT					0	0.0%	0	0.0	**0**					0	0.0%	0	0.0	**0**
WBR					0	0.0%	0	0.0	**0**					0	0.0%	0	0.0	**0**
WBU					0	0.0%	0	0.0	**0**					0	0.0%	0	0.0	**0**
North Approach Volumes																		
Entering	663	30	31	106	167	20.1%	425	2.5	**1088**	1188	16	42	89	147	11.0%	375	2.6	**1563**
Exiting	511	32	30	121	183	26.4%	471	2.6	**982**	964	13	17	58	88	8.4%	228	2.6	**1192**
Total	1174	62	61	227	350	23.0%	896	2.6	**2070**	2152	29	59	147	235	9.8%	603	2.6	**2755**
South Approach Volumes																		
Entering	532	33	29	120	182	25.5%	468	2.6	**1000**	1005	14	20	64	98	8.9%	253	2.6	**1258**
Exiting	689	43	37	117	197	22.2%	490	2.5	**1179**	1281	12	44	92	148	10.4%	382	2.6	**1663**
Total	1221	76	66	237	379	23.7%	957	2.5	**2178**	2286	26	64	156	246	9.7%	635	2.6	**2921**
West Approach Volumes																		
Entering	92	18	9	16	43	31.9%	93	2.2	**185**	159	0	2	5	7	4.2%	19	2.7	**178**
Exiting	87	6	2	4	12	12.1%	25	2.1	**112**	107	5	3	8	16	13.0%	38	2.4	**145**
Total	179	24	11	20	55	23.5%	118	2.1	**297**	266	5	5	13	23	8.0%	57	2.5	**323**
East Approach Volumes																		
Entering	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
Exiting	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
Total	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
Total Approach Volumes																		
Entering	1287	81	69	242	392	23.3%	986	2.5	**2273**	2352	30	64	158	252	9.7%	647	2.6	**2999**
Exiting	1287	81	69	242	392	23.3%	986	2.5	**2273**	2352	30	64	158	252	9.7%	647	2.6	**2999**
Total	2574	162	138	484	784	23.3%	1971	2.5	**4545**	4704	60	128	316	504	9.7%	1294	2.6	**5998**

Approach	AM Peak Hour (7:00-8:00am) Passenger Vehicles	AM Truck Volumes 2-axle 1.5	AM 3-axle 2.0	AM 4-axle 3.0	AM Total Trucks	AM Truck %	AM PCE	AM Average PCE*	AM Total PCE Volume	PM Peak Hour (5:00-6:00pm) Passenger Vehicles	PM Truck Volumes 2-axle 1.5	PM 3-axle 2.0	PM 4-axle 3.0	PM Total Trucks	PM Truck %	PM PCE	PM Average PCE*	PM Total PCE Volume
SBL	2		Data not available		2	50.0%	5	2.5	**7**	4		Data not available		6	60.0%	15	2.6	**19**
SBT	771				139	15.3%	350		**1121**	820				121	12.9%	310		**1130**
SBR	107				49	31.4%	123		**230**	140				35	20.0%	90		**230**
SBU	1				0	0.0%	0		**1**	1				0	0.0%	0		**1**
NBL	9				9	50.0%	23	2.5	**32**	21				2	8.7%	5	2.6	**26**
NBT	583				121	17.2%	304		**887**	755				95	11.2%	243		**998**
NBR	12				4	25.0%	10		**22**	14				3	17.6%	8		**22**
NBU	0				0	0.0%	0		**0**	0				0	0.0%	0		**0**
EBL	65				49	43.0%	123	2.5	**188**	178				20	10.1%	50	2.5	**228**
EBT	4				13	76.5%	33		**37**	0				17	0.0%	43		**43**
EBR	19				3	13.6%	8		**27**	46				9	16.4%	23		**69**
EBU	0				0	0.0%	0		**0**	3				1	25.0%	3		**6**
WBL	3				4	57.1%	11	2.7	**14**	6				0	0.0%	0	2.5	**6**
WBT	0				1	0.0%	3		**3**	1				0	0.0%	0		**1**
WBR	2				1	33.3%	3		**5**	1				2	66.7%	5		**6**
WBU	0				0	0.0%	0		**0**	1				0	0.0%	0		**1**
North Approach Volumes																		
Entering	881		Data not available		190	17.7%	478	2.5	**1359**	965		Data not available		162	14.4%	414	2.6	**1379**
Exiting	651				171	20.8%	431	2.5	**1082**	935				117	11.1%	298	2.5	**1233**
Total	1532				361	19.1%	909	2.5	**2441**	1900				279	12.8%	712	2.6	**2612**
South Approach Volumes																		
Entering	604		Data not available		134	18.2%	337	2.5	**941**	790		Data not available		100	11.2%	256	2.6	**1046**
Exiting	793				146	15.5%	363	2.5	**1156**	872				130	13.0%	331	2.5	**1203**
Total	1397				280	16.7%	701	2.5	**2098**	1662				230	12.2%	585	2.5	**2247**
West Approach Volumes																		
Entering	88		Data not available		65	42.5%	176	2.7	**264**	227		Data not available		47	17.2%	118	2.5	**345**
Exiting	116				59	33.7%	171	2.9	**287**	165				38	18.7%	106	2.8	**271**
Total	204				124	37.8%	347	2.8	**551**	392				85	17.8%	227	2.7	**619**
East Approach Volumes																		
Entering	5		Data not available		6	54.5%	16	2.7	**21**	9		Data not available		2	18.2%	5	2.5	**14**
Exiting	18				19	51.4%	55	2.9	**73**	19				26	57.8%	73	2.8	**92**
Total	23				25	52.1%	70	2.8	**93**	28				28	50.0%	75	2.7	**103**
Total Approach Volumes																		
Entering	1578		Data not available		395	20.0%	996	2.5	**2574**	1991		Data not available		311	13.5%	794	2.6	**2785**
Exiting	1578				395	20.0%	996	2.5	**2574**	1991				311	13.5%	794	2.6	**2785**
Total	3156				790	20.0%	1990	2.5	**5146**	3982				622	13.5%	1587	2.6	**5569**

*PCE average taken from nearby intersection of S Riverside with Industrial Dr (#5 of this study)

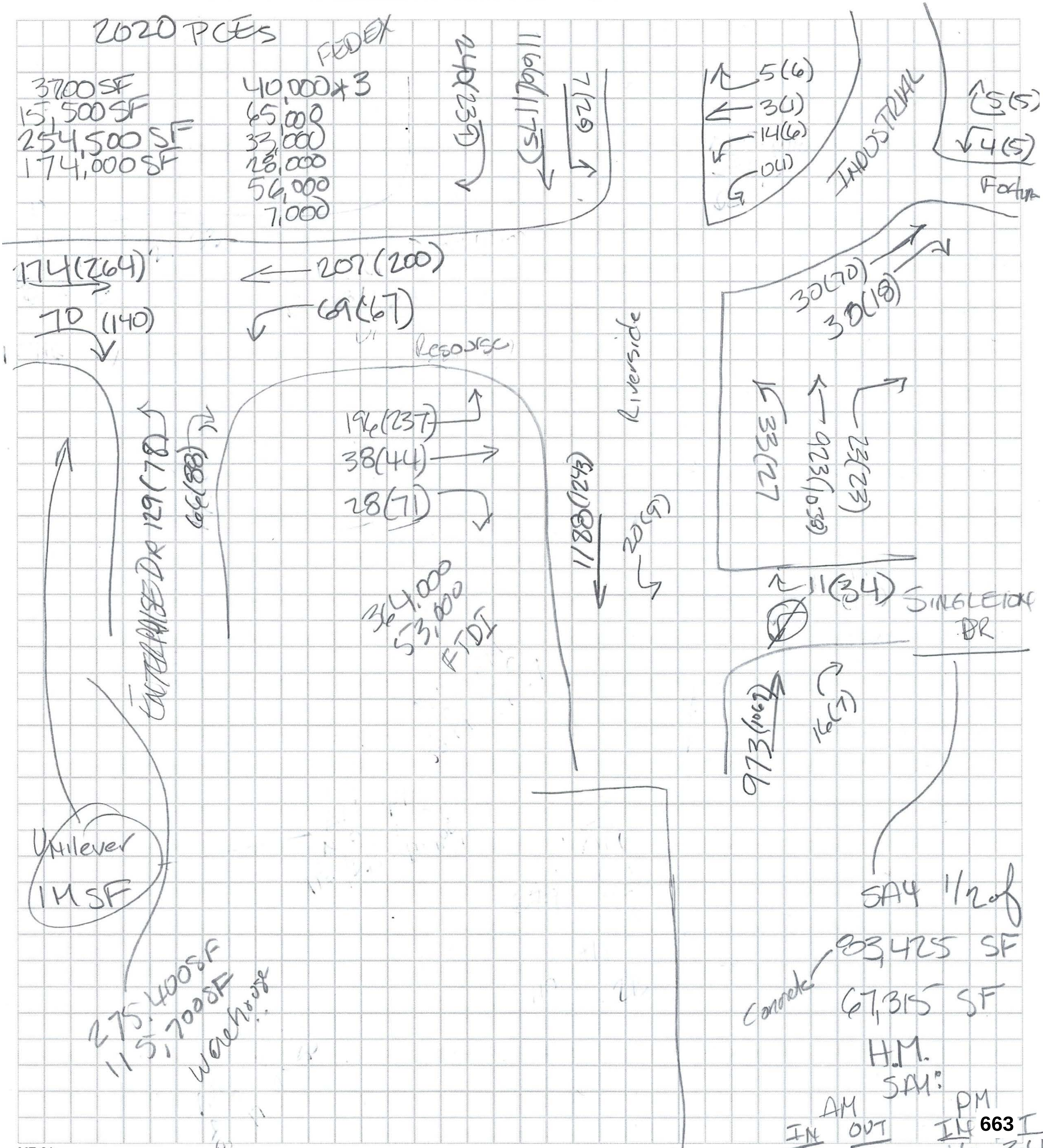
NV5

CALCULATION SHEET

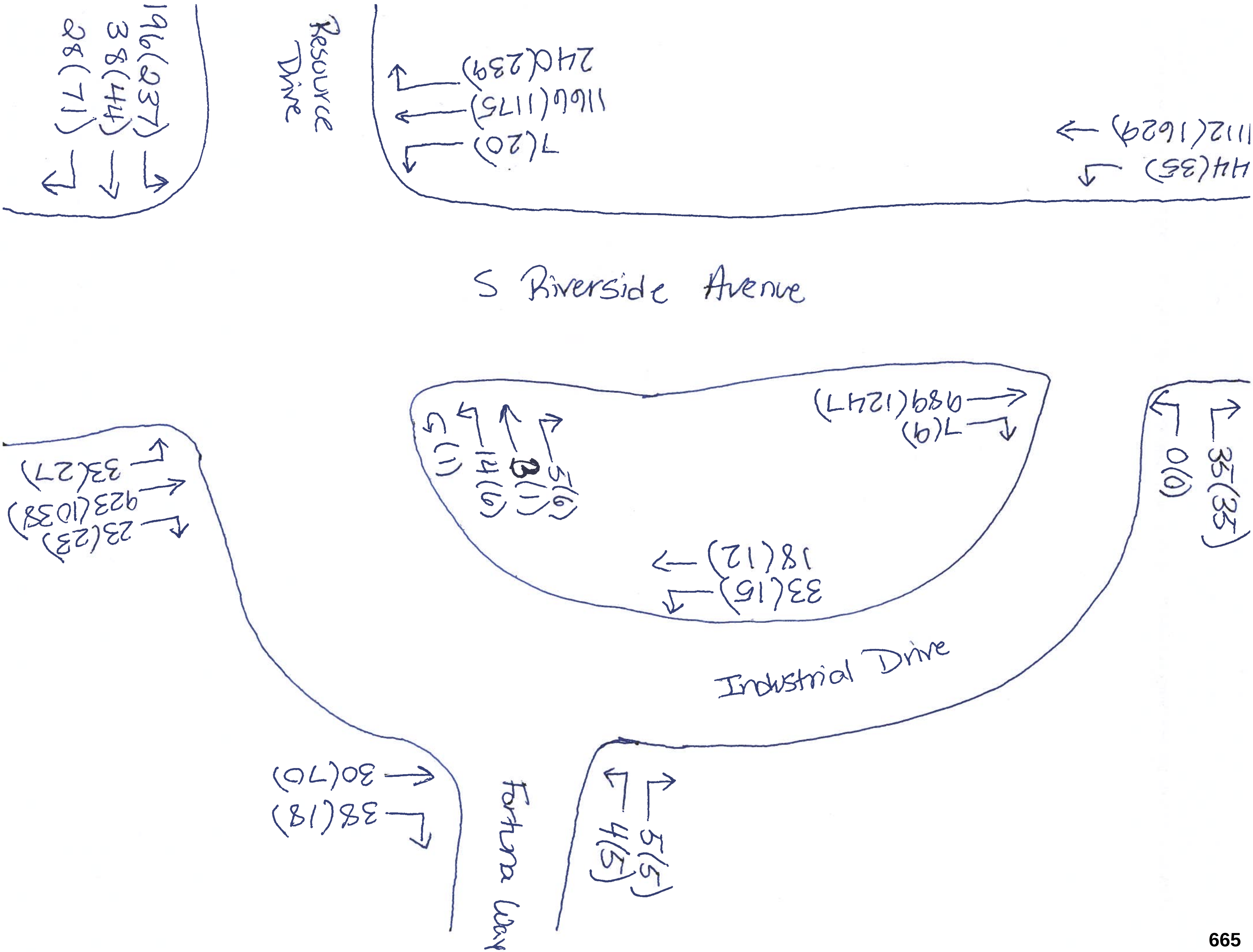
PAGE OF

CLIENT ____ SUBJECT ____ Prepared By ____ Date ____

PROJECT No. Use 154 ____ Reviewed By ____ Date ____



Approach	AM Peak Hour (7:00-8:00am)									PM Peak Hour (5:00-6:00pm)								
	Passenger Vehicles	Truck Volumes 2-axle 1.5	3-axle 2.0	4-axle 3.0	Total Trucks	Truck %	PCE	Average PCE	**Total PCE Volume**	Passenger Vehicles	Truck Volumes 2-axle 1.5	3-axle 2.0	4-axle 3.0	Total Trucks	Truck %	PCE	Average PCE	**Total PCE Volume**
SBL	23	4	3	5	12	34.3%	27	2.3	**50**	64	0	1	11	12	15.8%	35	2.9	**99**
SBT	731	17	10	34	61	7.7%	148	2.4	**879**	843	12	18	20	50	5.6%	114	2.3	**957**
SBR	66	6	5	20	31	32.0%	79	2.5	**145**	65	2	11	15	28	30.1%	70	2.5	**135**
SBU	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
NBL	76	10	1	8	19	20.0%	41	2.2	**117**	79	9	4	4	17	17.7%	34	2.0	**113**
NBT	514	30	7	24	61	10.6%	131	2.1	**645**	599	10	11	25	46	7.1%	112	2.4	**711**
NBR	8	8	3	3	14	63.6%	27	1.9	**35**	60	1	6	1	8	11.8%	17	2.1	**77**
NBU	7	0	0	0	0	0.0%	0	0.0	**7**	12	0	0	0	0	0.0%	0	0.0	**12**
EBL	81	6	5	12	23	22.1%	55	2.4	**136**	79	3	1	23	27	25.5%	76	2.8	**155**
EBT	73	5	3	2	10	12.0%	20	2.0	**93**	368	8	2	5	15	3.9%	31	2.1	**399**
EBR	42	6	4	5	15	26.3%	32	2.1	**74**	141	6	3	6	15	9.6%	33	2.2	**174**
EBU	0	0	0	0	0	0.0%	0	0.0	**0**	1	0	0	0	0	0.0%	0	0.0	**1**
WBL	69	5	7	1	13	15.9%	25	1.9	**94**	60	1	2	2	5	7.7%	12	2.4	**72**
WBT	222	5	4	12	21	8.6%	52	2.5	**274**	123	7	2	9	18	12.8%	42	2.3	**165**
WBR	22	4	7	12	23	51.1%	56	2.4	**78**	26	0	5	23	28	51.9%	79	2.8	**105**
WBU	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
North Approach Volumes																		
Entering	820	27	18	59	104	11.3%	254	2.4	**1074**	972	14	30	46	90	8.5%	219	2.4	**1191**
Exiting	617	40	19	48	107	14.8%	242	2.3	**859**	704	13	17	71	101	12.5%	267	2.6	**971**
Total	1437	67	37	107	211	12.8%	496	2.4	**1933**	1676	27	47	117	191	10.2%	486	2.5	**2162**
South Approach Volumes																		
Entering	605	48	11	35	94	13.4%	199	2.1	**804**	750	20	21	30	71	8.6%	162	2.3	**912**
Exiting	849	28	21	40	89	9.5%	204	2.3	**1053**	1056	19	23	28	70	6.2%	159	2.3	**1215**
Total	1454	76	32	75	183	11.2%	403	2.2	**1857**	1806	39	44	58	141	7.2%	321	2.3	**2127**
West Approach Volumes																		
Entering	196	17	12	19	48	19.7%	107	2.2	**303**	589	17	6	34	57	8.8%	140	2.5	**729**
Exiting	364	21	10	40	71	16.3%	172	2.4	**536**	268	18	17	28	63	19.0%	145	2.3	**413**
Total	560	38	22	59	119	17.5%	278	2.3	**838**	857	35	23	62	120	12.3%	285	2.4	**1142**
East Approach Volumes																		
Entering	313	14	18	25	57	15.4%	132	2.3	**445**	209	8	9	34	51	19.6%	132	2.6	**341**
Exiting	104	17	9	10	36	25.7%	74	2.1	**178**	492	9	9	17	35	6.6%	83	2.4	**575**
Total	417	31	27	35	93	18.2%	206	2.2	**623**	701	17	18	51	86	10.9%	215	2.5	**916**
Total Approach Volumes																		
Entering	1934	106	59	138	303	13.5%	691	2.3	**2625**	2520	59	66	144	269	9.6%	653	2.4	**3173**
Exiting	1934	106	59	138	303	13.5%	691	2.3	**2625**	2520	59	66	144	269	9.6%	653	2.4	**3173**
Total	3868	212	118	276	606	13.5%	1382	2.3	**5250**	5040	118	132	288	538	9.6%	1305	2.4	**6345**



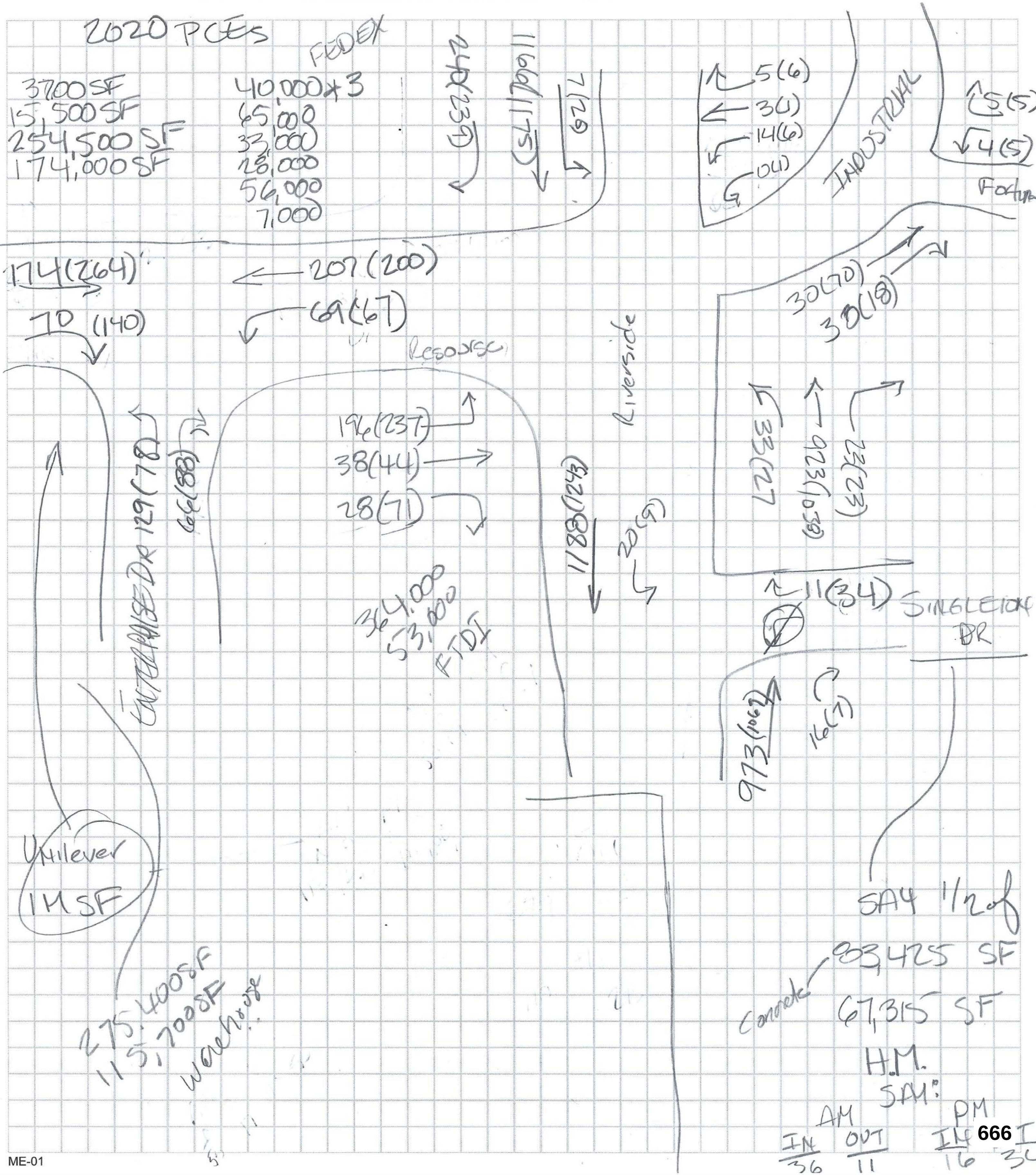
S Riverside Avenue
Resource Drive
Industrial Drive
Fortuna Way
196(237)
38(44)
28(71)
240(239)
1166(1175)
7(20)
1112(1629)
44(35)
989(1247)
7(9)
5(6)
3(1)
14(6)
6(1)
18(12)
33(15)
35(35)
0(0)
33(27)
923(1038)
23(23)
30(70)
38(18)
5(5)
4(5)

CALCULATION SHEET

PAGE _____ OF _____

CLIENT ______________ SUBJECT ______________ Prepared By ________ Date ________

PROJECT No. Use 154 Reviewed By ________ Date ________



ME-01

Appendix F – Synchro Analysis Outputs

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	37	185	548	179	170	37	357	628	160	62	1148	29
Future Volume (veh/h)	37	185	548	179	170	37	357	628	160	62	1148	29
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	40	201	596	195	185	40	388	683	174	67	1248	32
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	130	819	596	258	1075	480	503	1383	347	107	1304	33
Arrive On Green	0.07	0.23	0.23	0.14	0.30	0.30	0.15	0.34	0.34	0.06	0.25	0.25
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	3456	4069	1022	1781	5120	131
Grp Volume(v), veh/h	40	201	596	195	185	40	388	570	287	67	830	450
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1728	1702	1686	1781	1702	1847
Q Serve(g_s), s	1.8	3.8	19.0	8.7	3.2	1.5	8.9	10.9	11.2	3.0	19.8	19.8
Cycle Q Clear(g_c), s	1.8	3.8	19.0	8.7	3.2	1.5	8.9	10.9	11.2	3.0	19.8	19.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.61	1.00		0.07
Lane Grp Cap(c), veh/h	130	819	596	258	1075	480	503	1157	573	107	867	470
V/C Ratio(X)	0.31	0.25	1.00	0.75	0.17	0.08	0.77	0.49	0.50	0.62	0.96	0.96
Avail Cap(c_a), veh/h	410	819	596	410	1075	480	524	1157	573	205	867	470
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.3	25.9	25.7	33.8	21.2	20.6	33.9	21.6	21.6	37.8	30.3	30.3
Incr Delay (d2), s/veh	1.3	0.2	36.9	4.5	0.1	0.1	6.7	1.5	3.1	5.8	21.8	32.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	1.5	16.6	3.9	1.2	0.5	4.0	4.3	4.6	1.4	10.2	12.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.6	26.0	62.6	38.3	21.2	20.6	40.6	23.1	24.8	43.7	52.1	62.4
LnGrp LOS	D	C	F	D	C	C	D	C	C	D	D	E
Approach Vol, veh/h		837			420			1245			1347	
Approach Delay, s/veh		52.6			29.1			28.9			55.1	
Approach LOS		D			C			C			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.5	33.0	17.0	24.0	15.5	26.0	11.0	30.0				
Change Period (Y+Rc), s	4.5	6.0	6.0	6.0	4.5	6.0	6.0	6.0				
Max Green Setting (Gmax), s	8.5	23.0	18.0	18.0	11.5	20.0	18.0	18.0				
Max Q Clear Time (g_c+I1), s	5.0	13.2	10.7	21.0	10.9	21.8	3.8	5.2				
Green Ext Time (p_c), s	0.0	3.7	0.3	0.0	0.1	0.0	0.0	0.9				
Intersection Summary												
HCM 6th Ctrl Delay			43.3									
HCM 6th LOS			D									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	546	5	375	316	920	0	0	1059	555
Future Volume (veh/h)	0	0	0	546	5	375	316	920	0	0	1059	555
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1737	1737	1737	1678	1678	0	0	1870	1870
Adj Flow Rate, veh/h				678	0	257	322	939	0	0	1081	566
Peak Hour Factor				0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %				11	11	11	15	15	0	0	2	2
Cap, veh/h				878	0	391	440	2794	0	0	2612	643
Arrive On Green				0.27	0.00	0.27	0.14	0.61	0.00	0.00	0.41	0.41
Sat Flow, veh/h				3309	0	1472	3100	4731	0	0	6696	1585
Grp Volume(v), veh/h				678	0	257	322	939	0	0	1081	566
Grp Sat Flow(s),veh/h/ln				1654	0	1472	1550	1527	0	0	1609	1585
Q Serve(g_s), s				15.2	0.0	12.5	8.0	8.1	0.0	0.0	9.6	26.5
Cycle Q Clear(g_c), s				15.2	0.0	12.5	8.0	8.1	0.0	0.0	9.6	26.5
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				878	0	391	440	2794	0	0	2612	643
V/C Ratio(X)				0.77	0.00	0.66	0.73	0.34	0.00	0.00	0.41	0.88
Avail Cap(c_a), veh/h				1277	0	568	579	2794	0	0	2612	643
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				27.3	0.0	26.3	33.0	7.7	0.0	0.0	17.0	22.0
Incr Delay (d2), s/veh				1.8	0.0	1.9	3.3	0.3	0.0	0.0	0.5	15.8
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				6.0	0.0	4.4	2.9	1.9	0.0	0.0	3.1	11.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				29.1	0.0	28.1	36.3	8.0	0.0	0.0	17.5	37.9
LnGrp LOS				C	A	C	D	A	A	A	B	D
Approach Vol, veh/h					935			1261			1647	
Approach Delay, s/veh					28.8			15.2			24.5	
Approach LOS					C			B			C	

Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		54.0			16.4	37.6		26.3				
Change Period (Y+Rc), s		6.0			6.0	6.0		6.0				
Max Green Setting (Gmax), s		48.0			14.0	28.0		30.0				
Max Q Clear Time (g_c+I1), s		10.1			10.0	28.5		17.2				
Green Ext Time (p_c), s		6.7			0.4	0.0		3.1				

Intersection Summary			
HCM 6th Ctrl Delay			22.5
HCM 6th LOS			C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	336	8	469	0	0	0	0	897	402	399	1209	0
Future Volume (veh/h)	336	8	469	0	0	0	0	897	402	399	1209	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1693	1693	1693				0	1574	1574	1796	1796	0
Adj Flow Rate, veh/h	538	0	312				0	954	428	424	1286	0
Peak Hour Factor	0.94	0.94	0.94				0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	14	14	14				0	22	22	7	7	0
Cap, veh/h	856	0	381				0	1143	512	541	2102	0
Arrive On Green	0.27	0.00	0.27				0.00	0.39	0.39	0.16	0.62	0.00
Sat Flow, veh/h	3224	0	1434				0	3044	1302	3319	3503	0
Grp Volume(v), veh/h	538	0	312				0	942	440	424	1286	0
Grp Sat Flow(s),veh/h/ln	1612	0	1434				0	1432	1340	1659	1706	0
Q Serve(g_s), s	12.4	0.0	17.2				0.0	25.1	25.1	10.3	19.6	0.0
Cycle Q Clear(g_c), s	12.4	0.0	17.2				0.0	25.1	25.1	10.3	19.6	0.0
Prop In Lane	1.00		1.00				0.00		0.97	1.00		0.00
Lane Grp Cap(c), veh/h	856	0	381				0	1128	527	541	2102	0
V/C Ratio(X)	0.63	0.00	0.82				0.00	0.83	0.84	0.78	0.61	0.00
Avail Cap(c_a), veh/h	1069	0	476				0	1128	527	629	2102	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	27.3	0.0	29.1				0.0	23.1	23.1	33.9	10.0	0.0
Incr Delay (d2), s/veh	0.8	0.0	8.9				0.0	7.3	14.5	5.6	1.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.7	0.0	6.7				0.0	8.3	8.8	4.2	5.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.1	0.0	38.0				0.0	30.5	37.6	39.4	11.3	0.0
LnGrp LOS	C	A	D				A	C	D	D	B	A
Approach Vol, veh/h		850						1382			1710	
Approach Delay, s/veh		31.7						32.7			18.3	
Approach LOS		C						C			B	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	18.8	38.2		27.4		57.0						
Change Period (Y+Rc), s	6.0	6.0		6.0		6.0						
Max Green Setting (Gmax), s	15.0	30.0		27.0		51.0						
Max Q Clear Time (g_c+I1), s	12.3	27.1		19.2		21.6						
Green Ext Time (p_c), s	0.4	2.1		2.2		9.8						
Intersection Summary												
HCM 6th Ctrl Delay			26.3									
HCM 6th LOS			C									

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	256	20	71	29	28	30	84	945	28	37	1200	429
Future Volume (veh/h)	256	20	71	29	28	30	84	945	28	37	1200	429
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1693	1693	1693	1455	1455	1455	1500	1500	1500	1722	1722	1722
Adj Flow Rate, veh/h	272	21	76	31	30	32	89	1005	30	39	1277	456
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	14	14	14	30	30	30	27	27	27	12	12	12
Cap, veh/h	324	376	319	295	307	274	95	1597	48	75	1300	448
Arrive On Green	0.22	0.22	0.22	0.22	0.22	0.22	0.07	0.57	0.57	0.05	0.54	0.54
Sat Flow, veh/h	1213	1693	1434	1010	1383	1233	1428	2825	84	1640	2388	822
Grp Volume(v), veh/h	272	21	76	31	30	32	89	507	528	39	860	873
Grp Sat Flow(s),veh/h/ln	1213	1693	1434	1010	1383	1233	1428	1425	1485	1640	1636	1574
Q Serve(g_s), s	18.1	0.9	3.9	2.2	1.6	1.9	5.6	21.6	21.6	2.1	45.4	49.0
Cycle Q Clear(g_c), s	20.0	0.9	3.9	3.1	1.6	1.9	5.6	21.6	21.6	2.1	45.4	49.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.06	1.00		0.52
Lane Grp Cap(c), veh/h	324	376	319	295	307	274	95	806	839	75	891	857
V/C Ratio(X)	0.84	0.06	0.24	0.11	0.10	0.12	0.93	0.63	0.63	0.52	0.97	1.02
Avail Cap(c_a), veh/h	324	376	319	295	307	274	95	806	839	109	891	857
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.9	27.6	28.7	28.8	27.8	27.9	41.8	13.2	13.2	42.0	19.7	20.5
Incr Delay (d2), s/veh	17.4	0.1	0.4	0.2	0.1	0.2	71.0	1.6	1.5	5.5	22.1	35.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.3	0.3	1.3	0.5	0.5	0.5	3.7	5.7	6.0	0.9	18.8	22.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.2	27.6	29.1	28.9	28.0	28.1	112.8	14.8	14.7	47.5	41.7	56.0
LnGrp LOS	D	C	C	C	C	C	F	B	B	D	D	F
Approach Vol, veh/h		369			93			1124			1772	
Approach Delay, s/veh		47.5			28.4			22.5			48.9	
Approach LOS		D			C			C			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.1	55.9		25.0	11.0	54.0		25.0				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	5.0	48.0		19.0	5.0	48.0		19.0				
Max Q Clear Time (g_c+I1), s	4.1	23.6		22.0	7.6	51.0		5.1				
Green Ext Time (p_c), s	0.0	6.3		0.0	0.0	0.0		0.3				
Intersection Summary												
HCM 6th Ctrl Delay			39.3									
HCM 6th LOS			D									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	65	53	60	34	48	84	85	931	32	62	1088	127
Future Volume (veh/h)	65	53	60	34	48	84	85	931	32	62	1088	127
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1411	1411	1411	625	625	625	1574	1574	1574	1678	1678	1678
Adj Flow Rate, veh/h	71	58	65	37	52	91	92	1012	35	67	1183	138
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	33	33	33	86	86	86	22	22	22	15	15	15
Cap, veh/h	134	95	81	172	143	121	132	1470	51	104	1367	159
Arrive On Green	0.23	0.23	0.23	0.23	0.23	0.23	0.09	0.50	0.50	0.06	0.48	0.48
Sat Flow, veh/h	288	413	353	424	625	530	1499	2949	102	1598	2877	335
Grp Volume(v), veh/h	194	0	0	37	52	91	92	513	534	67	654	667
Grp Sat Flow(s),veh/h/ln	1054	0	0	424	625	530	1499	1495	1556	1598	1594	1617
Q Serve(g_s), s	7.9	0.0	0.0	0.0	5.1	11.6	4.3	18.9	18.9	3.0	26.4	26.6
Cycle Q Clear(g_c), s	12.9	0.0	0.0	8.3	5.1	11.6	4.3	18.9	18.9	3.0	26.4	26.6
Prop In Lane	0.37		0.34	1.00		1.00	1.00		0.07	1.00		0.21
Lane Grp Cap(c), veh/h	310	0	0	172	143	121	132	745	775	104	758	769
V/C Ratio(X)	0.63	0.00	0.00	0.22	0.36	0.75	0.70	0.69	0.69	0.65	0.86	0.87
Avail Cap(c_a), veh/h	442	0	0	221	216	183	249	827	861	221	838	850
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.6	0.0	0.0	24.7	23.4	25.9	32.0	13.8	13.8	33.0	16.9	16.9
Incr Delay (d2), s/veh	2.1	0.0	0.0	0.6	1.5	8.9	6.4	2.1	2.0	6.5	8.6	8.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	0.0	0.0	0.5	0.7	1.6	1.6	5.2	5.4	1.2	9.1	9.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.6	0.0	0.0	25.3	25.0	34.8	38.5	16.0	15.9	39.5	25.5	25.8
LnGrp LOS	C	A	A	C	C	C	D	B	B	D	C	C
Approach Vol, veh/h		194			180			1139			1388	
Approach Delay, s/veh		28.6			30.0			17.8			26.3	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.7	41.0		21.6	11.4	39.4		21.6				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	9.0	39.0		24.0	11.0	37.0		24.0				
Max Q Clear Time (g_c+I1), s	5.0	20.9		14.9	6.3	28.6		13.6				
Green Ext Time (p_c), s	0.0	5.7		0.7	0.1	4.7		0.7				

Intersection Summary			
HCM 6th Ctrl Delay			23.3
HCM 6th LOS			C

Intersection	
Int Delay, s/veh	0.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	35	989	7	44	1112
Future Vol, veh/h	0	35	989	7	44	1112
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	200	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	59	59	20	20	15	15
Mvmt Flow	0	38	1063	8	47	1196

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1759	536	0	0	1071	0
Stage 1	1067	-	-	-	-	-
Stage 2	692	-	-	-	-	-
Critical Hdwy	7.98	8.08	-	-	4.4	-
Critical Hdwy Stg 1	6.98	-	-	-	-	-
Critical Hdwy Stg 2	6.98	-	-	-	-	-
Follow-up Hdwy	4.09	3.89	-	-	2.35	-
Pot Cap-1 Maneuver	41	366	-	-	575	-
Stage 1	192	-	-	-	-	-
Stage 2	332	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	38	366	-	-	575	-
Mov Cap-2 Maneuver	124	-	-	-	-	-
Stage 1	192	-	-	-	-	-
Stage 2	305	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16	0	0.4
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	366	575	-
HCM Lane V/C Ratio	-	-	0.103	0.082	-
HCM Control Delay (s)	-	-	16	11.8	-
HCM Lane LOS	-	-	C	B	-
HCM 95th %tile Q(veh)	-	-	0.3	0.3	-

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	57	136	75	965	1090	42
Future Volume (veh/h)	57	136	75	965	1090	42
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	61	146	81	1038	1172	45
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	232	206	126	2713	2199	84
Arrive On Green	0.13	0.13	0.07	0.76	0.63	0.63
Sat Flow, veh/h	1781	1585	1781	3647	3583	134
Grp Volume(v), veh/h	61	146	81	1038	597	620
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1777	1777	1846
Q Serve(g_s), s	2.5	7.1	3.5	7.8	14.9	14.9
Cycle Q Clear(g_c), s	2.5	7.1	3.5	7.8	14.9	14.9
Prop In Lane	1.00	1.00	1.00			0.07
Lane Grp Cap(c), veh/h	232	206	126	2713	1120	1164
V/C Ratio(X)	0.26	0.71	0.64	0.38	0.53	0.53
Avail Cap(c_a), veh/h	457	407	201	2713	1120	1164
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.3	33.3	36.1	3.2	8.2	8.2
Incr Delay (d2), s/veh	0.6	4.4	5.4	0.4	1.8	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	6.3	1.6	1.1	4.3	4.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	31.9	37.7	41.5	3.6	10.0	10.0
LnGrp LOS	C	D	D	A	B	A
Approach Vol, veh/h	207			1119	1217	
Approach Delay, s/veh	36.0			6.3	10.0	
Approach LOS	D			A	B	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		66.0		13.9	10.6	55.4
Change Period (Y+Rc), s		6.0		4.5	6.0	6.0
Max Green Setting (Gmax), s		60.0		19.5	8.0	46.0
Max Q Clear Time (g_c+I1), s		9.8		9.1	5.5	16.9
Green Ext Time (p_c), s		7.8		0.4	0.0	8.0

Intersection Summary			
HCM 6th Ctrl Delay			10.5
HCM 6th LOS			B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	196	38	28	14	3	5	33	923	23	8	1166	240
Future Volume (veh/h)	196	38	28	14	3	5	33	923	23	8	1166	240
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1337	1337	1337	1085	1085	1085	1633	1633	1633	1633	1633	1633
Adj Flow Rate, veh/h	218	42	31	16	3	6	37	1026	26	9	1296	267
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	38	38	38	55	55	55	18	18	18	18	18	18
Cap, veh/h	306	176	130	155	27	42	59	1885	48	30	1518	309
Arrive On Green	0.25	0.25	0.25	0.25	0.25	0.25	0.04	0.61	0.61	0.02	0.59	0.59
Sat Flow, veh/h	1005	715	527	430	111	171	1555	3092	78	1555	2568	522
Grp Volume(v), veh/h	218	0	73	25	0	0	37	515	537	9	776	787
Grp Sat Flow(s),veh/h/ln	1005	0	1242	712	0	0	1555	1552	1619	1555	1552	1539
Q Serve(g_s), s	18.1	0.0	5.6	1.5	0.0	0.0	2.8	23.3	23.3	0.7	49.1	51.3
Cycle Q Clear(g_c), s	25.2	0.0	5.6	7.2	0.0	0.0	2.8	23.3	23.3	0.7	49.1	51.3
Prop In Lane	1.00		0.42	0.64		0.24	1.00		0.05	1.00		0.34
Lane Grp Cap(c), veh/h	306	0	306	224	0	0	59	946	987	30	917	910
V/C Ratio(X)	0.71	0.00	0.24	0.11	0.00	0.00	0.63	0.54	0.54	0.30	0.85	0.86
Avail Cap(c_a), veh/h	410	0	435	311	0	0	91	946	987	78	917	910
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.97	0.00	0.97	1.00	0.00	0.00	0.93	0.93	0.93	0.83	0.83	0.83
Uniform Delay (d), s/veh	43.7	0.0	36.2	36.8	0.0	0.0	56.9	13.7	13.7	58.1	20.1	20.5
Incr Delay (d2), s/veh	3.6	0.0	0.4	0.2	0.0	0.0	9.8	2.1	2.0	4.6	8.1	9.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.6	0.0	1.8	0.6	0.0	0.0	1.2	7.5	7.8	0.3	17.0	17.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.3	0.0	36.6	37.0	0.0	0.0	66.7	15.8	15.7	62.7	28.1	29.7
LnGrp LOS	D	A	D	D	A	A	E	B	B	E	C	C
Approach Vol, veh/h		291			25			1089			1572	
Approach Delay, s/veh		44.6			37.0			17.5			29.1	
Approach LOS		D			D			B			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.3	78.2		34.5	9.5	75.9		34.5				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	5.0	56.0		41.0	6.0	55.0		41.0				
Max Q Clear Time (g_c+I1), s	2.7	25.3		27.2	4.8	53.3		9.2				
Green Ext Time (p_c), s	0.0	6.7		1.3	0.0	1.3		0.1				

Intersection Summary			
HCM 6th Ctrl Delay			26.4
HCM 6th LOS			C

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	11	973	16	20	1188
Future Vol, veh/h	0	11	973	16	20	1188
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	12	1081	18	22	1320

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	550	0	0	1099	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	4.14	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	0	479	-	-	631	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	479	-	-	631	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.7	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	479	631	-
HCM Lane V/C Ratio	-	-	0.026	0.035	-
HCM Control Delay (s)	-	-	12.7	10.9	-
HCM Lane LOS	-	-	B	B	-
HCM 95th %tile Q(veh)	-	-	0.1	0.1	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	139	95	75	96	279	80	126	658	36	51	897	148
Future Volume (veh/h)	139	95	75	96	279	80	126	658	36	51	897	148
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1604	1604	1604	1678	1678	1678	1693	1693	1693	1737	1737	1737
Adj Flow Rate, veh/h	148	101	80	102	297	85	134	700	38	54	954	157
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	20	20	20	15	15	15	14	14	14	11	11	11
Cap, veh/h	183	292	247	137	362	102	170	1604	87	80	1519	677
Arrive On Green	0.12	0.18	0.18	0.09	0.15	0.15	0.11	0.52	0.52	0.10	0.92	0.92
Sat Flow, veh/h	1527	1604	1359	1598	2457	691	1612	3102	168	1654	3300	1472
Grp Volume(v), veh/h	148	101	80	102	191	191	134	363	375	54	954	157
Grp Sat Flow(s),veh/h/ln	1527	1604	1359	1598	1594	1553	1612	1608	1662	1654	1650	1472
Q Serve(g_s), s	11.3	6.6	6.1	7.5	13.9	14.4	9.7	16.9	16.9	3.8	6.6	1.3
Cycle Q Clear(g_c), s	11.3	6.6	6.1	7.5	13.9	14.4	9.7	16.9	16.9	3.8	6.6	1.3
Prop In Lane	1.00		1.00	1.00		0.44	1.00		0.10	1.00		1.00
Lane Grp Cap(c), veh/h	183	292	247	137	235	229	170	832	860	80	1519	677
V/C Ratio(X)	0.81	0.35	0.32	0.75	0.81	0.83	0.79	0.44	0.44	0.67	0.63	0.23
Avail Cap(c_a), veh/h	255	307	260	213	252	246	215	832	860	124	1519	677
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.5	42.8	42.7	53.6	49.5	49.7	52.3	18.1	18.1	53.2	2.8	2.6
Incr Delay (d2), s/veh	12.4	0.7	0.7	7.9	17.0	20.2	13.9	1.7	1.6	9.3	2.0	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.9	2.6	2.1	3.2	6.5	6.7	4.4	6.0	6.2	1.7	1.4	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.8	43.5	43.4	61.5	66.5	70.0	66.3	19.7	19.7	62.5	4.8	3.4
LnGrp LOS	E	D	D	E	E	E	E	B	B	E	A	A
Approach Vol, veh/h		329			484			872			1165	
Approach Delay, s/veh		52.6			66.8			26.9			7.3	
Approach LOS		D			E			C			A	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.8	67.1	15.3	26.8	17.7	60.2	19.4	22.7
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	8.0	51.0	15.0	22.0	15.0	44.0	19.0	18.0
Max Q Clear Time (g_c+I1), s	5.8	18.9	9.5	8.6	11.7	8.6	13.3	16.4
Green Ext Time (p_c), s	0.0	4.2	0.1	0.5	0.1	7.4	0.2	0.3

Intersection Summary	
HCM 6th Ctrl Delay	28.6
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	2.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	4	5	30	38	33	18
Future Vol, veh/h	4	5	30	38	33	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	50	50	50	50	50	50
Mvmt Flow	4	6	33	42	37	20

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	148	54	0	0	75	0
Stage 1	54	-	-	-	-	-
Stage 2	94	-	-	-	-	-
Critical Hdwy	6.9	6.7	-	-	4.6	-
Critical Hdwy Stg 1	5.9	-	-	-	-	-
Critical Hdwy Stg 2	5.9	-	-	-	-	-
Follow-up Hdwy	3.95	3.75	-	-	2.65	-
Pot Cap-1 Maneuver	744	893	-	-	1269	-
Stage 1	859	-	-	-	-	-
Stage 2	822	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	722	893	-	-	1269	-
Mov Cap-2 Maneuver	722	-	-	-	-	-
Stage 1	859	-	-	-	-	-
Stage 2	798	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.5	0	5.1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	808	1269	-
HCM Lane V/C Ratio	-	-	0.012	0.029	-
HCM Control Delay (s)	-	-	9.5	7.9	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0.1	-

Intersection	
Int Delay, s/veh	4.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	174	70	69	207	129	66
Future Vol, veh/h	174	70	69	207	129	66
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	200	-	200	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	193	78	77	230	143	73

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	271	0	616	232
Stage 1	-	-	-	-	232	-
Stage 2	-	-	-	-	384	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1292	-	454	807
Stage 1	-	-	-	-	807	-
Stage 2	-	-	-	-	688	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1292	-	427	807
Mov Cap-2 Maneuver	-	-	-	-	517	-
Stage 1	-	-	-	-	807	-
Stage 2	-	-	-	-	647	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2	13
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	517	807	-	-	1292	-
HCM Lane V/C Ratio	0.277	0.091	-	-	0.059	-
HCM Control Delay (s)	14.6	9.9	-	-	8	-
HCM Lane LOS	B	A	-	-	A	-
HCM 95th %tile Q(veh)	1.1	0.3	-	-	0.2	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	94	253	476	186	294	126	567	1259	196	82	786	59
Future Volume (veh/h)	94	253	476	186	294	126	567	1259	196	82	786	59
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	97	261	491	192	303	130	585	1298	202	85	810	61
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	165	686	568	259	874	390	572	1487	231	131	1171	88
Arrive On Green	0.09	0.19	0.19	0.15	0.25	0.25	0.17	0.33	0.33	0.07	0.24	0.24
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	3456	4456	693	1781	4846	363
Grp Volume(v), veh/h	97	261	491	192	303	130	585	992	508	85	568	303
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1728	1702	1746	1781	1702	1805
Q Serve(g_s), s	4.1	5.0	10.3	8.1	5.5	5.3	13.0	21.5	21.5	3.6	11.9	12.0
Cycle Q Clear(g_c), s	4.1	5.0	10.3	8.1	5.5	5.3	13.0	21.5	21.5	3.6	11.9	12.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.40	1.00		0.20
Lane Grp Cap(c), veh/h	165	686	568	259	874	390	572	1136	583	131	823	436
V/C Ratio(X)	0.59	0.38	0.86	0.74	0.35	0.33	1.02	0.87	0.87	0.65	0.69	0.69
Avail Cap(c_a), veh/h	431	859	645	431	874	390	572	1136	583	136	823	436
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.2	27.6	7.1	32.2	24.4	24.3	32.8	24.6	24.6	35.4	27.1	27.2
Incr Delay (d2), s/veh	3.3	0.3	10.7	4.2	0.2	0.5	43.8	9.3	16.5	9.9	4.7	8.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	2.1	4.2	3.7	2.3	2.0	8.7	9.6	11.0	1.9	5.2	6.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.6	28.0	17.8	36.3	24.7	24.8	76.6	34.0	41.1	45.4	31.8	36.0
LnGrp LOS	D	C	B	D	C	C	F	C	D	D	C	D
Approach Vol, veh/h		849			625			2085			956	
Approach Delay, s/veh		23.2			28.3			47.6			34.4	
Approach LOS		C			C			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.8	31.2	16.4	20.2	18.0	24.0	12.3	24.3
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	5.0	25.0	18.0	18.0	12.0	18.0	18.0	18.0
Max Q Clear Time (g_c+I1), s	5.6	23.5	10.1	12.3	15.0	14.0	6.1	7.5
Green Ext Time (p_c), s	0.0	1.2	0.3	1.9	0.0	2.0	0.2	1.7

Intersection Summary	
HCM 6th Ctrl Delay	37.6
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	625	3	501	313	1579	0	0	1150	402
Future Volume (veh/h)	0	0	0	625	3	501	313	1579	0	0	1150	402
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1752	1752	1752	1841	1841	0	0	1856	1856
Adj Flow Rate, veh/h				815	0	349	326	1645	0	0	1198	419
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %				10	10	10	4	4	0	0	3	3
Cap, veh/h				1056	0	470	461	2786	0	0	2263	557
Arrive On Green				0.32	0.00	0.32	0.14	0.55	0.00	0.00	0.35	0.35
Sat Flow, veh/h				3337	0	1485	3401	5191	0	0	6643	1572
Grp Volume(v), veh/h				815	0	349	326	1645	0	0	1198	419
Grp Sat Flow(s),veh/h/ln				1668	0	1485	1700	1675	0	0	1596	1572
Q Serve(g_s), s				17.1	0.0	16.3	7.1	16.8	0.0	0.0	11.6	18.2
Cycle Q Clear(g_c), s				17.1	0.0	16.3	7.1	16.8	0.0	0.0	11.6	18.2
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				1056	0	470	461	2786	0	0	2263	557
V/C Ratio(X)				0.77	0.00	0.74	0.71	0.59	0.00	0.00	0.53	0.75
Avail Cap(c_a), veh/h				1592	0	708	614	2786	0	0	2263	557
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				24.0	0.0	23.7	32.1	11.4	0.0	0.0	19.9	22.0
Incr Delay (d2), s/veh				1.3	0.0	2.3	2.5	0.9	0.0	0.0	0.9	9.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				6.6	0.0	5.7	2.8	4.8	0.0	0.0	3.8	7.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				25.3	0.0	26.0	34.5	12.4	0.0	0.0	20.8	31.1
LnGrp LOS				C	A	C	C	B	A	A	C	C
Approach Vol, veh/h					1164			1971			1617	
Approach Delay, s/veh					25.5			16.0			23.4	
Approach LOS					C			B			C	

Timer - Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		48.0			15.5	32.5		29.5
Change Period (Y+Rc), s		6.0			6.0	6.0		6.0
Max Green Setting (Gmax), s		42.0			13.0	23.0		36.0
Max Q Clear Time (g_c+I1), s		18.8			9.1	20.2		19.1
Green Ext Time (p_c), s		11.7			0.4	2.1		4.4

Intersection Summary	
HCM 6th Ctrl Delay	20.9
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	594	0	445	0	0	0	0	1321	620	462	1337	0
Future Volume (veh/h)	594	0	445	0	0	0	0	1321	620	462	1337	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1767	1767	1767				0	1781	1781	1796	1796	0
Adj Flow Rate, veh/h	755	0	306				0	1362	639	476	1378	0
Peak Hour Factor	0.97	0.97	0.97				0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	9	9	9				0	8	8	7	7	0
Cap, veh/h	823	0	366				0	1412	649	516	2199	0
Arrive On Green	0.24	0.00	0.24				0.00	0.43	0.43	0.16	0.64	0.00
Sat Flow, veh/h	3365	0	1497				0	3418	1497	3319	3503	0
Grp Volume(v), veh/h	755	0	306				0	1355	646	476	1378	0
Grp Sat Flow(s),veh/h/ln	1682	0	1497				0	1621	1512	1659	1706	0
Q Serve(g_s), s	19.7	0.0	17.5				0.0	36.6	38.0	12.7	21.7	0.0
Cycle Q Clear(g_c), s	19.7	0.0	17.5				0.0	36.6	38.0	12.7	21.7	0.0
Prop In Lane	1.00		1.00				0.00		0.99	1.00		0.00
Lane Grp Cap(c), veh/h	823	0	366				0	1405	655	516	2199	0
V/C Ratio(X)	0.92	0.00	0.84				0.00	0.96	0.99	0.92	0.63	0.00
Avail Cap(c_a), veh/h	823	0	366				0	1405	655	516	2199	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	33.1	0.0	32.3				0.0	24.8	25.2	37.5	9.5	0.0
Incr Delay (d2), s/veh	15.1	0.0	15.4				0.0	17.0	31.7	22.2	1.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.5	0.0	7.7				0.0	15.1	17.2	6.3	6.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.2	0.0	47.7				0.0	41.8	57.0	59.6	10.9	0.0
LnGrp LOS	D	A	D				A	D	E	E	B	A
Approach Vol, veh/h		1061						2001			1854	
Approach Delay, s/veh		48.1						46.7			23.4	
Approach LOS		D						D			C	

Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	19.0	44.0		27.0		63.0						
Change Period (Y+Rc), s	6.0	6.0		6.0		6.0						
Max Green Setting (Gmax), s	13.0	38.0		21.0		57.0						
Max Q Clear Time (g_c+I1), s	14.7	40.0		21.7		23.7						
Green Ext Time (p_c), s	0.0	0.0		0.0		11.3						

Intersection Summary			
HCM 6th Ctrl Delay			38.2
HCM 6th LOS			D

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	414	119	149	33	30	73	35	1394	22	27	1465	286
Future Volume (veh/h)	414	119	149	33	30	73	35	1394	22	27	1465	286
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1411	1411	1411	1767	1767	1767	1707	1707	1707
Adj Flow Rate, veh/h	440	127	159	35	32	78	37	1483	23	29	1559	304
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	7	7	7	33	33	33	9	9	9	13	13	13
Cap, veh/h	385	531	450	281	396	353	76	1670	26	65	1330	252
Arrive On Green	0.30	0.30	0.30	0.30	0.30	0.30	0.05	0.49	0.49	0.04	0.49	0.49
Sat Flow, veh/h	1232	1796	1522	825	1340	1196	1682	3383	52	1626	2720	516
Grp Volume(v), veh/h	440	127	159	35	32	78	37	735	771	29	912	951
Grp Sat Flow(s),veh/h/ln	1232	1796	1522	825	1340	1196	1682	1678	1757	1626	1622	1614
Q Serve(g_s), s	21.7	4.7	7.2	3.0	1.5	4.3	1.9	34.7	34.8	1.5	43.0	43.0
Cycle Q Clear(g_c), s	26.0	4.7	7.2	7.7	1.5	4.3	1.9	34.7	34.8	1.5	43.0	43.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.03	1.00		0.32
Lane Grp Cap(c), veh/h	385	531	450	281	396	353	76	829	868	65	793	789
V/C Ratio(X)	1.14	0.24	0.35	0.12	0.08	0.22	0.49	0.89	0.89	0.44	1.15	1.21
Avail Cap(c_a), veh/h	385	531	450	281	396	353	115	829	868	111	793	789
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.5	23.5	24.4	26.4	22.4	23.4	41.0	20.1	20.1	41.3	22.5	22.5
Incr Delay (d2), s/veh	90.2	0.2	0.5	0.2	0.1	0.3	4.8	11.5	11.2	4.7	82.0	104.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	17.7	1.9	2.5	0.6	0.5	1.2	0.8	13.6	14.2	0.7	31.2	35.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	125.7	23.7	24.8	26.6	22.4	23.7	45.8	31.5	31.3	45.9	104.5	126.7
LnGrp LOS	F	C	C	C	C	C	D	C	C	D	F	F
Approach Vol, veh/h		726			145			1543			1892	
Approach Delay, s/veh		85.8			24.1			31.7			114.8	
Approach LOS		F			C			C			F	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.5	48.4		31.0	9.0	48.0		31.0				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	5.0	42.0		25.0	5.0	42.0		25.0				
Max Q Clear Time (g_c+I1), s	3.5	36.8		28.0	3.9	45.0		9.7				
Green Ext Time (p_c), s	0.0	3.6		0.0	0.0	0.0		0.6				
Intersection Summary												
HCM 6th Ctrl Delay			77.1									
HCM 6th LOS			E									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	107	15	94	38	19	65	85	1251	19	55	1506	78
Future Volume (veh/h)	107	15	94	38	19	65	85	1251	19	55	1506	78
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1707	1707	1707	1633	1633	1633	1752	1752	1752	1707	1707	1707
Adj Flow Rate, veh/h	115	16	101	41	20	70	91	1345	20	59	1619	84
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	13	13	13	18	18	18	10	10	10	13	13	13
Cap, veh/h	192	32	122	282	342	290	134	1845	27	93	1653	85
Arrive On Green	0.21	0.21	0.21	0.21	0.21	0.21	0.08	0.55	0.55	0.06	0.53	0.53
Sat Flow, veh/h	604	154	584	1113	1633	1384	1668	3357	50	1626	3138	162
Grp Volume(v), veh/h	232	0	0	41	20	70	91	666	699	59	833	870
Grp Sat Flow(s),veh/h/ln	1342	0	0	1113	1633	1384	1668	1664	1743	1626	1622	1678
Q Serve(g_s), s	12.1	0.0	0.0	0.0	0.8	3.4	4.3	24.6	24.6	2.9	40.8	41.6
Cycle Q Clear(g_c), s	13.4	0.0	0.0	3.2	0.8	3.4	4.3	24.6	24.6	2.9	40.8	41.6
Prop In Lane	0.50		0.44	1.00		1.00	1.00		0.03	1.00		0.10
Lane Grp Cap(c), veh/h	347	0	0	282	342	290	134	915	958	93	854	884
V/C Ratio(X)	0.67	0.00	0.00	0.15	0.06	0.24	0.68	0.73	0.73	0.63	0.97	0.98
Avail Cap(c_a), veh/h	443	0	0	363	460	390	184	915	958	159	854	884
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.7	0.0	0.0	26.8	25.8	26.9	36.5	13.8	13.8	37.6	18.8	19.0
Incr Delay (d2), s/veh	2.6	0.0	0.0	0.2	0.1	0.4	5.9	3.0	2.8	6.9	24.7	26.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.3	0.0	0.0	0.6	0.3	1.1	1.8	7.6	8.0	1.2	17.4	18.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.3	0.0	0.0	27.0	25.9	27.3	42.4	16.8	16.7	44.5	43.4	45.3
LnGrp LOS	C	A	A	C	C	C	D	B	B	D	D	D
Approach Vol, veh/h		232			131			1456			1762	
Approach Delay, s/veh		33.3			27.0			18.3			44.4	
Approach LOS		C			C			B			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.7	49.9		22.1	11.5	48.0		22.1				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	7.0	43.0		22.0	8.0	42.0		22.0				
Max Q Clear Time (g_c+I1), s	4.9	26.6		15.4	6.3	43.6		5.4				
Green Ext Time (p_c), s	0.0	7.5		0.7	0.0	0.0		0.4				
Intersection Summary												
HCM 6th Ctrl Delay			32.4									
HCM 6th LOS			C									

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	3	35	1247	9	36	1629
Future Vol, veh/h	3	35	1247	9	36	1629
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	200	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	32	32	9	9	12	12
Mvmt Flow	3	38	1355	10	39	1771

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2324	683	0	0	1365	0
Stage 1	1360	-	-	-	-	-
Stage 2	964	-	-	-	-	-
Critical Hdwy	7.44	7.54	-	-	4.34	-
Critical Hdwy Stg 1	6.44	-	-	-	-	-
Critical Hdwy Stg 2	6.44	-	-	-	-	-
Follow-up Hdwy	3.82	3.62	-	-	2.32	-
Pot Cap-1 Maneuver	21	329	-	-	450	-
Stage 1	156	-	-	-	-	-
Stage 2	268	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	19	329	-	-	450	-
Mov Cap-2 Maneuver	95	-	-	-	-	-
Stage 1	156	-	-	-	-	-
Stage 2	245	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	20.4	0	0.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	275	450	-
HCM Lane V/C Ratio	-	-	0.15	0.087	-
HCM Control Delay (s)	-	-	20.4	13.8	-
HCM Lane LOS	-	-	C	B	-
HCM 95th %tile Q(veh)	-	-	0.5	0.3	-

Movement	EBL	EBR	NBU	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (veh/h)	30	155	2	98	1210	1573	53
Future Volume (veh/h)	30	155	2	98	1210	1573	53
Initial Q (Qb), veh	0	0		0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00			1.00
Parking Bus, Adj	1.00	1.00		1.00	1.00	1.00	1.00
Work Zone On Approach	No				No	No	
Adj Sat Flow, veh/h/ln	1870	1870		1870	1870	1870	1870
Adj Flow Rate, veh/h	33	170		108	1330	1729	58
Peak Hour Factor	0.91	0.91		0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2		2	2	2	2
Cap, veh/h	252	225		157	2629	2079	69
Arrive On Green	0.14	0.14		0.09	0.74	0.59	0.59
Sat Flow, veh/h	1781	1585		1781	3647	3602	117
Grp Volume(v), veh/h	33	170		108	1330	872	915
Grp Sat Flow(s),veh/h/ln	1781	1585		1781	1777	1777	1849
Q Serve(g_s), s	1.4	8.7		5.0	13.1	33.1	33.6
Cycle Q Clear(g_c), s	1.4	8.7		5.0	13.1	33.1	33.6
Prop In Lane	1.00	1.00		1.00			0.06
Lane Grp Cap(c), veh/h	252	225		157	2629	1053	1096
V/C Ratio(X)	0.13	0.76		0.69	0.51	0.83	0.83
Avail Cap(c_a), veh/h	401	357		160	2629	1053	1096
HCM Platoon Ratio	1.00	1.00		1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00		1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.7	34.8		37.4	4.6	13.7	13.9
Incr Delay (d2), s/veh	0.2	5.2		11.5	0.7	7.5	7.5
Initial Q Delay(d3),s/veh	0.0	0.0		0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	7.7		2.6	3.7	13.6	14.3
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	31.9	40.0		48.9	5.3	21.3	21.4
LnGrp LOS	C	D		D	A	C	C
Approach Vol, veh/h	203				1438	1787	
Approach Delay, s/veh	38.6				8.5	21.3	
Approach LOS	D				A	C	
Timer - Assigned Phs		2		4	5	6	
Phs Duration (G+Y+Rc), s		67.4		17.0	12.4	55.0	
Change Period (Y+Rc), s		6.0		6.0	6.0	6.0	
Max Green Setting (Gmax), s		61.4		18.0	6.6	48.8	
Max Q Clear Time (g_c+I1), s		15.1		10.7	7.0	35.6	
Green Ext Time (p_c), s		14.5		0.3	0.0	9.9	
Intersection Summary							
HCM 6th Ctrl Delay			17.0				
HCM 6th LOS			B				
Notes							

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	243	44	71	7	1	6	27	1038	23	21	1175	239
Future Volume (veh/h)	243	44	71	7	1	6	27	1038	23	21	1175	239
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1648	1648	1648	1826	1826	1826	1737	1737	1737	1678	1678	1678
Adj Flow Rate, veh/h	270	49	79	8	1	7	30	1153	26	23	1306	266
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	17	17	17	5	5	5	11	11	11	15	15	15
Cap, veh/h	388	149	240	187	36	131	63	1829	41	54	1453	292
Arrive On Green	0.26	0.26	0.26	0.26	0.26	0.26	0.04	0.55	0.55	0.03	0.55	0.55
Sat Flow, veh/h	1240	568	915	508	136	501	1654	3299	74	1598	2644	532
Grp Volume(v), veh/h	270	0	128	16	0	0	30	577	602	23	780	792
Grp Sat Flow(s),veh/h/ln	1240	0	1483	1145	0	0	1654	1650	1724	1598	1594	1582
Q Serve(g_s), s	14.5	0.0	7.0	0.1	0.0	0.0	1.8	24.0	24.0	1.4	43.2	45.2
Cycle Q Clear(g_c), s	21.5	0.0	7.0	7.0	0.0	0.0	1.8	24.0	24.0	1.4	43.2	45.2
Prop In Lane	1.00		0.62	0.50		0.44	1.00		0.04	1.00		0.34
Lane Grp Cap(c), veh/h	388	0	389	354	0	0	63	915	955	54	876	869
V/C Ratio(X)	0.70	0.00	0.33	0.05	0.00	0.00	0.47	0.63	0.63	0.43	0.89	0.91
Avail Cap(c_a), veh/h	608	0	652	600	0	0	99	915	955	96	876	869
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.4	0.0	29.8	27.6	0.0	0.0	47.1	15.3	15.3	47.4	19.9	20.3
Incr Delay (d2), s/veh	2.3	0.0	0.5	0.1	0.0	0.0	5.4	3.3	3.2	5.3	13.2	15.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.5	0.0	2.6	0.3	0.0	0.0	0.8	8.3	8.6	0.6	16.2	17.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.7	0.0	30.3	27.7	0.0	0.0	52.6	18.6	18.4	52.7	33.1	35.6
LnGrp LOS	D	A	C	C	A	A	D	B	B	D	C	D
Approach Vol, veh/h		398			16			1209			1595	
Approach Delay, s/veh		35.3			27.7			19.4			34.6	
Approach LOS		D			C			B			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.4	60.5		31.2	8.8	60.0		31.2
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0
Max Green Setting (Gmax), s	5.0	54.0		43.0	5.0	54.0		43.0
Max Q Clear Time (g_c+I1), s	3.4	26.0		23.5	3.8	47.2		9.0
Green Ext Time (p_c), s	0.0	7.6		1.8	0.0	4.8		0.1

Intersection Summary	
HCM 6th Ctrl Delay	28.9
HCM 6th LOS	C

Intersection						
Int Delay, s/veh	0.3					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	34	1069	7	9	1243
Future Vol, veh/h	0	34	1069	7	9	1243
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	38	1188	8	10	1381

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	598	0	0	1196	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	4.14	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	0	445	-	-	579	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	445	-	-	579	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.8	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	445	579	-
HCM Lane V/C Ratio	-	-	0.085	0.017	-
HCM Control Delay (s)	-	-	13.8	11.3	-
HCM Lane LOS	-	-	B	B	-
HCM 95th %tile Q(veh)	-	-	0.3	0.1	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	159	407	177	73	168	107	127	725	79	101	976	138
Future Volume (veh/h)	159	407	177	73	168	107	127	725	79	101	976	138
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1767	1767	1767	1604	1604	1604	1767	1767	1767	1781	1781	1781
Adj Flow Rate, veh/h	169	433	188	78	179	114	135	771	84	107	1038	147
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	9	9	9	20	20	20	9	9	9	8	8	8
Cap, veh/h	211	485	411	108	401	242	174	1204	131	145	1274	568
Arrive On Green	0.13	0.27	0.27	0.07	0.22	0.22	0.10	0.39	0.39	0.09	0.38	0.38
Sat Flow, veh/h	1682	1767	1497	1527	1825	1104	1682	3053	332	1697	3385	1510
Grp Volume(v), veh/h	169	433	188	78	148	145	135	424	431	107	1038	147
Grp Sat Flow(s),veh/h/ln	1682	1767	1497	1527	1523	1405	1682	1678	1707	1697	1692	1510
Q Serve(g_s), s	11.2	26.9	11.9	5.7	9.6	10.3	8.9	23.4	23.4	7.0	31.5	7.7
Cycle Q Clear(g_c), s	11.2	26.9	11.9	5.7	9.6	10.3	8.9	23.4	23.4	7.0	31.5	7.7
Prop In Lane	1.00		1.00	1.00		0.79	1.00		0.19	1.00		1.00
Lane Grp Cap(c), veh/h	211	485	411	108	335	309	174	662	673	145	1274	568
V/C Ratio(X)	0.80	0.89	0.46	0.72	0.44	0.47	0.78	0.64	0.64	0.74	0.81	0.26
Avail Cap(c_a), veh/h	309	541	459	120	335	309	191	662	673	178	1274	568
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.6	39.8	34.4	52.0	38.5	38.8	49.9	28.0	28.0	51.0	32.0	24.6
Incr Delay (d2), s/veh	9.0	16.0	0.8	17.2	0.9	1.1	16.5	4.7	4.6	11.8	5.8	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.1	13.3	4.3	2.6	3.6	3.5	4.4	9.5	9.6	3.3	12.8	2.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.6	55.8	35.2	69.2	39.4	39.9	66.5	32.7	32.7	62.8	37.8	25.7
LnGrp LOS	E	E	D	E	D	D	E	C	C	E	D	C
Approach Vol, veh/h		790			371			990			1292	
Approach Delay, s/veh		51.3			45.9			37.3			38.5	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.8	50.0	13.1	36.4	16.8	48.0	19.3	30.1
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	11.0	43.0	8.0	34.0	12.0	42.0	20.0	22.0
Max Q Clear Time (g_c+I1), s	9.0	25.4	7.7	28.9	10.9	33.5	13.2	12.3
Green Ext Time (p_c), s	0.0	4.4	0.0	1.4	0.0	4.3	0.2	1.0

Intersection Summary	
HCM 6th Ctrl Delay	41.9
HCM 6th LOS	D

Intersection	
Int Delay, s/veh	1.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	5	70	18	15	12
Future Vol, veh/h	5	5	70	18	15	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	50	50	50	50	50	50
Mvmt Flow	6	6	78	20	17	13

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	135	88	0	0	98	0
Stage 1	88	-	-	-	-	-
Stage 2	47	-	-	-	-	-
Critical Hdwy	6.9	6.7	-	-	4.6	-
Critical Hdwy Stg 1	5.9	-	-	-	-	-
Critical Hdwy Stg 2	5.9	-	-	-	-	-
Follow-up Hdwy	3.95	3.75	-	-	2.65	-
Pot Cap-1 Maneuver	757	853	-	-	1242	-
Stage 1	828	-	-	-	-	-
Stage 2	866	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	746	853	-	-	1242	-
Mov Cap-2 Maneuver	746	-	-	-	-	-
Stage 1	828	-	-	-	-	-
Stage 2	854	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.6	0	4.4
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	796	1242	-
HCM Lane V/C Ratio	-	-	0.014	0.013	-
HCM Control Delay (s)	-	-	9.6	7.9	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	3.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	264	140	67	200	78	88
Future Vol, veh/h	264	140	67	200	78	88
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	200	-	200	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	293	156	74	222	87	98

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	449	0	741	371
Stage 1	-	-	-	-	371	-
Stage 2	-	-	-	-	370	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1111	-	384	675
Stage 1	-	-	-	-	698	-
Stage 2	-	-	-	-	699	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1111	-	358	675
Mov Cap-2 Maneuver	-	-	-	-	471	-
Stage 1	-	-	-	-	698	-
Stage 2	-	-	-	-	652	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.1	12.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	471	675	-	-	1111	-
HCM Lane V/C Ratio	0.184	0.145	-	-	0.067	-
HCM Control Delay (s)	14.4	11.2	-	-	8.5	-
HCM Lane LOS	B	B	-	-	A	-
HCM 95th %tile Q(veh)	0.7	0.5	-	-	0.2	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	192	570	186	177	38	371	653	166	65	1194	30
Future Volume (veh/h)	38	192	570	186	177	38	371	653	166	65	1194	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	38	192	570	186	177	38	371	653	166	65	1194	30
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	81	766	564	238	1079	481	486	1491	373	103	1452	36
Arrive On Green	0.05	0.22	0.22	0.13	0.30	0.30	0.14	0.37	0.37	0.06	0.28	0.28
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	3456	4072	1019	1781	5123	129
Grp Volume(v), veh/h	38	192	570	186	177	38	371	544	275	65	793	431
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1728	1702	1687	1781	1702	1847
Q Serve(g_s), s	1.8	4.0	19.0	8.9	3.2	1.5	9.1	10.6	10.9	3.1	19.2	19.2
Cycle Q Clear(g_c), s	1.8	4.0	19.0	8.9	3.2	1.5	9.1	10.6	10.9	3.1	19.2	19.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.60	1.00		0.07
Lane Grp Cap(c), veh/h	81	766	564	238	1079	481	486	1246	617	103	965	524
V/C Ratio(X)	0.47	0.25	1.01	0.78	0.16	0.08	0.76	0.44	0.45	0.63	0.82	0.82
Avail Cap(c_a), veh/h	121	766	564	242	1079	481	549	1246	617	162	965	524
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.0	28.7	28.4	36.9	22.5	21.9	36.5	21.1	21.2	40.6	29.5	29.5
Incr Delay (d2), s/veh	4.1	0.2	40.4	14.8	0.1	0.1	5.6	1.1	2.3	6.2	7.9	13.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	1.7	17.6	4.8	1.3	0.6	4.2	4.3	4.6	1.5	8.6	10.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.2	28.9	68.8	51.8	22.6	22.0	42.1	22.2	23.5	46.8	37.4	43.1
LnGrp LOS	D	C	F	D	C	C	D	C	C	D	D	D
Approach Vol, veh/h		800			401			1190			1289	
Approach Delay, s/veh		58.1			36.1			28.7			39.8	
Approach LOS		E			D			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.1	37.3	16.8	24.0	17.4	30.0	9.0	31.8
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	7.0	30.0	11.0	18.0	13.0	24.0	5.0	24.0
Max Q Clear Time (g_c+I1), s	5.1	12.9	10.9	21.0	11.1	21.2	3.8	5.2
Green Ext Time (p_c), s	0.0	5.2	0.0	0.0	0.3	1.9	0.0	1.1

Intersection Summary	
HCM 6th Ctrl Delay	39.8
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	568	5	390	329	957	0	0	1102	577
Future Volume (veh/h)	0	0	0	568	5	390	329	957	0	0	1102	577
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1737	1737	1737	1678	1678	0	0	1870	1870
Adj Flow Rate, veh/h				691	0	262	329	957	0	0	1102	577
Peak Hour Factor				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %				11	11	11	15	15	0	0	2	2
Cap, veh/h				890	0	396	449	2781	0	0	2576	635
Arrive On Green				0.27	0.00	0.27	0.14	0.61	0.00	0.00	0.40	0.40
Sat Flow, veh/h				3309	0	1472	3100	4731	0	0	6696	1585
Grp Volume(v), veh/h				691	0	262	329	957	0	0	1102	577
Grp Sat Flow(s),veh/h/ln				1654	0	1472	1550	1527	0	0	1609	1585
Q Serve(g_s), s				15.6	0.0	12.8	8.2	8.4	0.0	0.0	10.0	27.7
Cycle Q Clear(g_c), s				15.6	0.0	12.8	8.2	8.4	0.0	0.0	10.0	27.7
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				890	0	396	449	2781	0	0	2576	635
V/C Ratio(X)				0.78	0.00	0.66	0.73	0.34	0.00	0.00	0.43	0.91
Avail Cap(c_a), veh/h				1271	0	565	615	2781	0	0	2576	635
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				27.3	0.0	26.2	33.0	7.9	0.0	0.0	17.5	22.8
Incr Delay (d2), s/veh				2.0	0.0	1.9	2.9	0.3	0.0	0.0	0.5	19.3
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				6.1	0.0	4.5	3.0	2.0	0.0	0.0	3.2	11.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				29.2	0.0	28.1	35.9	8.2	0.0	0.0	18.0	42.1
LnGrp LOS				C	A	C	D	A	A	A	B	D
Approach Vol, veh/h					953			1286			1679	
Approach Delay, s/veh					28.9			15.3			26.3	
Approach LOS					C			B			C	

Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		54.0			16.7	37.3		26.7				
Change Period (Y+Rc), s		6.0			6.0	6.0		6.0				
Max Green Setting (Gmax), s		48.0			15.0	27.0		30.0				
Max Q Clear Time (g_c+I1), s		10.4			10.2	29.7		17.6				
Green Ext Time (p_c), s		6.8			0.5	0.0		3.1				

Intersection Summary	
HCM 6th Ctrl Delay	23.3
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	350	8	488	0	0	0	0	933	418	415	1258	0
Future Volume (veh/h)	350	8	488	0	0	0	0	933	418	415	1258	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1693	1693	1693				0	1574	1574	1796	1796	0
Adj Flow Rate, veh/h	527	0	305				0	933	418	415	1258	0
Peak Hour Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	14	14	14				0	22	22	7	7	0
Cap, veh/h	805	0	358				0	1223	548	527	2173	0
Arrive On Green	0.25	0.00	0.25				0.00	0.42	0.42	0.16	0.64	0.00
Sat Flow, veh/h	3224	0	1434				0	3046	1300	3319	3503	0
Grp Volume(v), veh/h	527	0	305				0	920	431	415	1258	0
Grp Sat Flow(s),veh/h/ln	1612	0	1434				0	1432	1340	1659	1706	0
Q Serve(g_s), s	12.9	0.0	17.8				0.0	24.1	24.1	10.6	18.7	0.0
Cycle Q Clear(g_c), s	12.9	0.0	17.8				0.0	24.1	24.1	10.6	18.7	0.0
Prop In Lane	1.00		1.00				0.00		0.97	1.00		0.00
Lane Grp Cap(c), veh/h	805	0	358				0	1207	564	527	2173	0
V/C Ratio(X)	0.65	0.00	0.85				0.00	0.76	0.76	0.79	0.58	0.00
Avail Cap(c_a), veh/h	880	0	391				0	1207	564	604	2173	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	29.6	0.0	31.5				0.0	21.7	21.7	35.6	9.2	0.0
Incr Delay (d2), s/veh	1.6	0.0	15.4				0.0	4.6	9.4	6.1	1.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.0	0.0	7.5				0.0	7.6	7.9	4.4	5.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.2	0.0	46.8				0.0	26.3	31.2	41.7	10.3	0.0
LnGrp LOS	C	A	D				A	C	C	D	B	A
Approach Vol, veh/h		832						1351			1673	
Approach Delay, s/veh		36.9						27.9			18.1	
Approach LOS		D						C			B	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	19.0	42.0		27.0		61.0						
Change Period (Y+Rc), s	6.0	6.0		6.0		6.0						
Max Green Setting (Gmax), s	15.0	34.0		23.0		55.0						
Max Q Clear Time (g_c+I1), s	12.6	26.1		19.8		20.7						
Green Ext Time (p_c), s	0.4	4.7		1.1		9.9						
Intersection Summary												
HCM 6th Ctrl Delay			25.6									
HCM 6th LOS			C									
Notes												

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	266	21	74	30	29	31	87	983	29	38	1248	446
Future Volume (veh/h)	266	21	74	30	29	31	87	983	29	38	1248	446
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1693	1693	1693	1455	1455	1455	1500	1500	1500	1722	1722	1722
Adj Flow Rate, veh/h	266	21	74	30	29	31	87	983	29	38	1248	446
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	14	14	14	30	30	30	27	27	27	12	12	12
Cap, veh/h	339	395	335	306	323	288	95	1568	46	74	1272	440
Arrive On Green	0.23	0.23	0.23	0.23	0.23	0.23	0.07	0.55	0.55	0.05	0.53	0.53
Sat Flow, veh/h	1215	1693	1434	1012	1383	1233	1428	2826	83	1640	2385	825
Grp Volume(v), veh/h	266	21	74	30	29	31	87	496	516	38	843	851
Grp Sat Flow(s),veh/h/ln	1215	1693	1434	1012	1383	1233	1428	1425	1485	1640	1636	1574
Q Serve(g_s), s	19.2	0.9	3.8	2.1	1.5	1.8	5.4	21.4	21.4	2.0	44.6	48.0
Cycle Q Clear(g_c), s	21.0	0.9	3.8	3.0	1.5	1.8	5.4	21.4	21.4	2.0	44.6	48.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.06	1.00		0.52
Lane Grp Cap(c), veh/h	339	395	335	306	323	288	95	791	824	74	873	839
V/C Ratio(X)	0.78	0.05	0.22	0.10	0.09	0.11	0.91	0.63	0.63	0.51	0.97	1.01
Avail Cap(c_a), veh/h	339	395	335	306	323	288	95	791	824	109	873	839
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.6	26.8	27.9	27.9	27.0	27.1	41.7	13.7	13.7	42.0	20.2	21.0
Incr Delay (d2), s/veh	11.4	0.1	0.3	0.1	0.1	0.2	64.8	1.6	1.5	5.4	22.5	34.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.6	0.3	1.2	0.5	0.5	0.5	3.5	5.8	6.0	0.9	18.8	21.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.0	26.8	28.2	28.1	27.1	27.3	106.5	15.2	15.2	47.4	42.7	55.6
LnGrp LOS	D	C	C	C	C	C	F	B	B	D	D	F
Approach Vol, veh/h		361			90			1099			1732	
Approach Delay, s/veh		42.0			27.5			22.4			49.1	
Approach LOS		D			C			C			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.1	54.9		26.0	11.0	53.0		26.0				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	5.0	47.0		20.0	5.0	47.0		20.0				
Max Q Clear Time (g_c+I1), s	4.0	23.4		23.0	7.4	50.0		5.0				
Green Ext Time (p_c), s	0.0	6.0		0.0	0.0	0.0		0.3				
Intersection Summary												
HCM 6th Ctrl Delay			38.8									
HCM 6th LOS			D									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	68	55	62	35	50	87	88	969	33	65	1132	132
Future Volume (veh/h)	68	55	62	35	50	87	88	969	33	65	1132	132
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1411	1411	1411	625	625	625	1574	1574	1574	1678	1678	1678
Adj Flow Rate, veh/h	68	55	62	35	50	87	88	969	33	65	1132	132
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	33	33	33	86	86	86	22	22	22	15	15	15
Cap, veh/h	133	91	78	173	137	116	127	1482	50	104	1389	162
Arrive On Green	0.22	0.22	0.22	0.22	0.22	0.22	0.08	0.50	0.50	0.07	0.48	0.48
Sat Flow, veh/h	288	414	354	426	625	530	1499	2951	100	1598	2876	335
Grp Volume(v), veh/h	185	0	0	35	50	87	88	491	511	65	626	638
Grp Sat Flow(s),veh/h/ln	1057	0	0	426	625	530	1499	1495	1556	1598	1594	1617
Q Serve(g_s), s	7.2	0.0	0.0	0.0	4.8	10.8	4.0	17.1	17.1	2.8	23.6	23.7
Cycle Q Clear(g_c), s	12.0	0.0	0.0	7.4	4.8	10.8	4.0	17.1	17.1	2.8	23.6	23.7
Prop In Lane	0.37		0.34	1.00		1.00	1.00		0.06	1.00		0.21
Lane Grp Cap(c), veh/h	302	0	0	173	137	116	127	751	782	104	770	781
V/C Ratio(X)	0.61	0.00	0.00	0.20	0.36	0.75	0.69	0.65	0.65	0.62	0.81	0.82
Avail Cap(c_a), veh/h	392	0	0	207	187	158	192	935	973	227	1020	1035
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.2	0.0	0.0	24.3	23.3	25.7	31.3	13.0	13.0	32.0	15.5	15.5
Incr Delay (d2), s/veh	2.0	0.0	0.0	0.6	1.6	12.3	6.6	1.1	1.1	5.9	3.9	3.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	0.0	0.0	0.5	0.7	1.6	1.5	4.4	4.6	1.1	7.1	7.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.2	0.0	0.0	24.9	24.9	37.9	37.9	14.1	14.1	38.0	19.4	19.4
LnGrp LOS	C	A	A	C	C	D	D	B	B	D	B	B
Approach Vol, veh/h		185			172			1090			1329	
Approach Delay, s/veh		28.2			31.5			16.0			20.3	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.6	40.3		20.4	11.0	39.0		20.4				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	9.0	43.0		20.0	8.0	44.0		20.0				
Max Q Clear Time (g_c+I1), s	4.8	19.1		14.0	6.0	25.7		12.8				
Green Ext Time (p_c), s	0.0	5.9		0.5	0.0	7.3		0.5				

Intersection Summary			
HCM 6th Ctrl Delay			19.8
HCM 6th LOS			B

Intersection	
Int Delay, s/veh	0.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	36	1029	7	46	1157
Future Vol, veh/h	0	36	1029	7	46	1157
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	200	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	59	59	20	20	15	15
Mvmt Flow	0	36	1029	7	46	1157

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1704	518	0	0	1036	0
Stage 1	1033	-	-	-	-	-
Stage 2	671	-	-	-	-	-
Critical Hdwy	7.98	8.08	-	-	4.4	-
Critical Hdwy Stg 1	6.98	-	-	-	-	-
Critical Hdwy Stg 2	6.98	-	-	-	-	-
Follow-up Hdwy	4.09	3.89	-	-	2.35	-
Pot Cap-1 Maneuver	46	378	-	-	594	-
Stage 1	202	-	-	-	-	-
Stage 2	342	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	42	378	-	-	594	-
Mov Cap-2 Maneuver	131	-	-	-	-	-
Stage 1	202	-	-	-	-	-
Stage 2	316	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.5	0	0.4
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	378	594	-
HCM Lane V/C Ratio	-	-	0.095	0.077	-
HCM Control Delay (s)	-	-	15.5	11.6	-
HCM Lane LOS	-	-	C	B	-
HCM 95th %tile Q(veh)	-	-	0.3	0.3	-

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	59	141	78	1004	1134	44
Future Volume (veh/h)	59	141	78	1004	1134	44
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	59	141	78	1004	1134	44
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	225	201	122	2661	2219	86
Arrive On Green	0.13	0.13	0.07	0.75	0.64	0.64
Sat Flow, veh/h	1781	1585	1781	3647	3581	135
Grp Volume(v), veh/h	59	141	78	1004	578	600
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1777	1777	1846
Q Serve(g_s), s	2.4	6.8	3.4	7.9	14.0	14.0
Cycle Q Clear(g_c), s	2.4	6.8	3.4	7.9	14.0	14.0
Prop In Lane	1.00	1.00	1.00			0.07
Lane Grp Cap(c), veh/h	225	201	122	2661	1131	1175
V/C Ratio(X)	0.26	0.70	0.64	0.38	0.51	0.51
Avail Cap(c_a), veh/h	445	396	233	2661	1131	1175
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.6	33.6	36.3	3.5	7.9	7.9
Incr Delay (d2), s/veh	0.6	4.4	5.4	0.4	1.7	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.2	1.6	2.0	5.0	5.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	32.2	38.0	41.8	3.9	9.5	9.4
LnGrp LOS	C	D	D	A	A	A
Approach Vol, veh/h	200			1082	1178	
Approach Delay, s/veh	36.3			6.7	9.5	
Approach LOS	D			A	A	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		65.0		15.1	9.0	56.0
Change Period (Y+Rc), s		6.0		6.0	4.5	6.0
Max Green Setting (Gmax), s		59.0		19.0	9.5	45.0
Max Q Clear Time (g_c+I1), s		9.9		8.8	5.4	16.0
Green Ext Time (p_c), s		9.4		0.4	0.0	9.5
Intersection Summary						
HCM 6th Ctrl Delay			10.4			
HCM 6th LOS			B			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	204	40	29	15	3	5	34	960	24	8	1213	250
Future Volume (veh/h)	204	40	29	15	3	5	34	960	24	8	1213	250
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1337	1337	1337	1085	1085	1085	1633	1633	1633	1633	1633	1633
Adj Flow Rate, veh/h	204	40	29	15	3	5	34	960	24	8	1213	250
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	38	38	38	55	55	55	18	18	18	18	18	18
Cap, veh/h	288	164	119	148	27	35	57	1948	49	28	1569	320
Arrive On Green	0.23	0.23	0.23	0.23	0.23	0.23	0.04	0.63	0.63	0.02	0.61	0.61
Sat Flow, veh/h	1006	720	522	434	119	154	1555	3094	77	1555	2566	524
Grp Volume(v), veh/h	204	0	69	23	0	0	34	481	503	8	729	734
Grp Sat Flow(s),veh/h/ln	1006	0	1243	707	0	0	1555	1552	1619	1555	1552	1539
Q Serve(g_s), s	16.7	0.0	5.5	1.4	0.0	0.0	2.6	20.0	20.0	0.6	41.3	42.5
Cycle Q Clear(g_c), s	23.6	0.0	5.5	6.9	0.0	0.0	2.6	20.0	20.0	0.6	41.3	42.5
Prop In Lane	1.00		0.42	0.65		0.22	1.00		0.05	1.00		0.34
Lane Grp Cap(c), veh/h	288	0	282	210	0	0	57	977	1020	28	949	941
V/C Ratio(X)	0.71	0.00	0.24	0.11	0.00	0.00	0.60	0.49	0.49	0.28	0.77	0.78
Avail Cap(c_a), veh/h	328	0	331	243	0	0	78	977	1020	78	949	941
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.84	0.84	0.84
Uniform Delay (d), s/veh	45.0	0.0	38.0	38.5	0.0	0.0	56.9	11.9	11.9	58.1	17.1	17.3
Incr Delay (d2), s/veh	5.9	0.0	0.4	0.2	0.0	0.0	9.6	1.8	1.7	4.5	5.1	5.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.4	0.0	1.7	0.6	0.0	0.0	1.1	6.3	6.6	0.3	13.6	14.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.8	0.0	38.4	38.7	0.0	0.0	66.6	13.7	13.6	62.7	22.1	22.7
LnGrp LOS	D	A	D	D	A	A	E	B	B	E	C	C
Approach Vol, veh/h		273			23			1018			1471	
Approach Delay, s/veh		47.7			38.7			15.4			22.7	
Approach LOS		D			D			B			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.2	80.6		32.2	9.4	78.4		32.2				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	5.0	66.0		31.0	5.0	66.0		31.0				
Max Q Clear Time (g_c+I1), s	2.6	22.0		25.6	4.6	44.5		8.9				
Green Ext Time (p_c), s	0.0	6.3		0.7	0.0	9.7		0.1				
Intersection Summary												
HCM 6th Ctrl Delay			22.6									
HCM 6th LOS			C									

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	11	1012	17	21	1236
Future Vol, veh/h	0	11	1012	17	21	1236
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	11	1012	17	21	1236

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	515	0	0	1029	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	4.14	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	0	505	-	-	671	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	505	-	-	671	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.3	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	505	671	-
HCM Lane V/C Ratio	-	-	0.022	0.031	-
HCM Control Delay (s)	-	-	12.3	10.5	-
HCM Lane LOS	-	-	B	B	-
HCM 95th %tile Q(veh)	-	-	0.1	0.1	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	145	99	78	100	290	83	131	685	37	53	933	154
Future Volume (veh/h)	145	99	78	100	290	83	131	685	37	53	933	154
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1604	1604	1604	1678	1678	1678	1693	1693	1693	1737	1737	1737
Adj Flow Rate, veh/h	145	99	78	100	290	83	131	685	37	53	933	154
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	20	20	20	15	15	15	14	14	14	11	11	11
Cap, veh/h	180	287	243	134	357	100	167	1621	88	79	1540	687
Arrive On Green	0.12	0.18	0.18	0.08	0.15	0.15	0.10	0.52	0.52	0.10	0.93	0.93
Sat Flow, veh/h	1527	1604	1359	1598	2457	690	1612	3103	167	1654	3300	1472
Grp Volume(v), veh/h	145	99	78	100	186	187	131	355	367	53	933	154
Grp Sat Flow(s),veh/h/ln	1527	1604	1359	1598	1594	1553	1612	1608	1662	1654	1650	1472
Q Serve(g_s), s	11.1	6.5	6.0	7.3	13.6	14.0	9.5	16.2	16.2	3.7	5.2	1.1
Cycle Q Clear(g_c), s	11.1	6.5	6.0	7.3	13.6	14.0	9.5	16.2	16.2	3.7	5.2	1.1
Prop In Lane	1.00		1.00	1.00		0.44	1.00		0.10	1.00		1.00
Lane Grp Cap(c), veh/h	180	287	243	134	231	225	167	840	868	79	1540	687
V/C Ratio(X)	0.81	0.34	0.32	0.75	0.81	0.83	0.78	0.42	0.42	0.67	0.61	0.22
Avail Cap(c_a), veh/h	242	321	272	186	252	246	215	840	868	124	1540	687
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.6	43.1	42.9	53.7	49.6	49.8	52.5	17.6	17.6	53.3	2.3	2.2
Incr Delay (d2), s/veh	13.4	0.7	0.8	9.9	16.0	19.2	13.3	1.6	1.5	9.3	1.8	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.8	2.6	2.0	3.2	6.3	6.5	4.3	5.8	6.0	1.6	1.2	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	65.0	43.8	43.6	63.6	65.7	69.1	65.7	19.1	19.1	62.7	4.1	2.9
LnGrp LOS	E	D	D	E	E	E	E	B	B	E	A	A
Approach Vol, veh/h		322			473			853			1140	
Approach Delay, s/veh		53.3			66.6			26.3			6.7	
Approach LOS		D			E			C			A	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.7	67.7	15.1	26.5	17.5	61.0	19.1	22.4				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	8.0	52.0	13.0	23.0	15.0	45.0	18.0	18.0				
Max Q Clear Time (g_c+I1), s	5.7	18.2	9.3	8.5	11.5	7.2	13.1	16.0				
Green Ext Time (p_c), s	0.0	4.1	0.1	0.6	0.1	7.3	0.1	0.4				
Intersection Summary												
HCM 6th Ctrl Delay			28.2									
HCM 6th LOS			C									

Intersection						
Int Delay, s/veh	2.7					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	4	5	31	40	34	19
Future Vol, veh/h	4	5	31	40	34	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	50	50	50	50	50	50
Mvmt Flow	4	5	31	40	34	19

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	138	51	0	0	71	0
Stage 1	51	-	-	-	-	-
Stage 2	87	-	-	-	-	-
Critical Hdwy	6.9	6.7	-	-	4.6	-
Critical Hdwy Stg 1	5.9	-	-	-	-	-
Critical Hdwy Stg 2	5.9	-	-	-	-	-
Follow-up Hdwy	3.95	3.75	-	-	2.65	-
Pot Cap-1 Maneuver	754	896	-	-	1273	-
Stage 1	862	-	-	-	-	-
Stage 2	829	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	734	896	-	-	1273	-
Mov Cap-2 Maneuver	734	-	-	-	-	-
Stage 1	862	-	-	-	-	-
Stage 2	807	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.5	0	5.1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	816	1273	-
HCM Lane V/C Ratio	-	-	0.011	0.027	-
HCM Control Delay (s)	-	-	9.5	7.9	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0.1	-

Intersection	
Int Delay, s/veh	4.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	181	73	72	215	134	69
Future Vol, veh/h	181	73	72	215	134	69
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	200	-	200	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	181	73	72	215	134	69

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	254	0	577	218
Stage 1	-	-	-	-	218	-
Stage 2	-	-	-	-	359	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1311	-	478	822
Stage 1	-	-	-	-	818	-
Stage 2	-	-	-	-	707	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1311	-	452	822
Mov Cap-2 Maneuver	-	-	-	-	537	-
Stage 1	-	-	-	-	818	-
Stage 2	-	-	-	-	668	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2	12.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	537	822	-	-	1311	-
HCM Lane V/C Ratio	0.25	0.084	-	-	0.055	-
HCM Control Delay (s)	13.9	9.8	-	-	7.9	-
HCM Lane LOS	B	A	-	-	A	-
HCM 95th %tile Q(veh)	1	0.3	-	-	0.2	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	98	263	495	194	306	131	590	1310	204	85	818	61
Future Volume (veh/h)	98	263	495	194	306	131	590	1310	204	85	818	61
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	98	263	495	194	306	131	590	1310	204	85	818	61
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	144	758	654	246	962	429	689	1569	244	128	1089	81
Arrive On Green	0.08	0.21	0.21	0.14	0.27	0.27	0.20	0.35	0.35	0.07	0.22	0.22
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	3456	4456	694	1781	4849	360
Grp Volume(v), veh/h	98	263	495	194	306	131	590	1001	513	85	573	306
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1728	1702	1745	1781	1702	1806
Q Serve(g_s), s	4.8	5.6	19.0	9.4	6.1	5.9	14.7	24.0	24.0	4.1	14.0	14.1
Cycle Q Clear(g_c), s	4.8	5.6	19.0	9.4	6.1	5.9	14.7	24.0	24.0	4.1	14.0	14.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.40	1.00		0.20
Lane Grp Cap(c), veh/h	144	758	654	246	962	429	689	1199	615	128	764	405
V/C Ratio(X)	0.68	0.35	0.76	0.79	0.32	0.31	0.86	0.83	0.83	0.66	0.75	0.75
Avail Cap(c_a), veh/h	200	758	654	260	962	429	698	1199	615	140	764	405
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.8	29.8	22.3	37.1	25.9	25.8	34.4	26.5	26.5	40.3	32.2	32.3
Incr Delay (d2), s/veh	5.5	0.3	5.1	14.2	0.2	0.4	10.1	6.9	12.6	10.1	6.7	12.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	2.4	9.3	5.0	2.6	2.2	7.0	10.5	11.7	2.2	6.3	7.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.4	30.1	27.4	51.3	26.1	26.2	44.6	33.4	39.1	50.4	38.9	44.5
LnGrp LOS	D	C	C	D	C	C	D	C	D	D	D	D
Approach Vol, veh/h		856			631			2104			964	
Approach Delay, s/veh		30.3			33.9			37.9			41.7	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.4	36.4	17.3	24.0	22.8	25.0	12.2	29.1
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	6.0	30.0	12.0	18.0	17.0	19.0	9.0	21.0
Max Q Clear Time (g_c+I1), s	6.1	26.0	11.4	21.0	16.7	16.1	6.8	8.1
Green Ext Time (p_c), s	0.0	3.1	0.0	0.0	0.1	1.6	0.0	2.0

Intersection Summary	
HCM 6th Ctrl Delay	36.7
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	650	3	521	326	1643	0	0	1196	418
Future Volume (veh/h)	0	0	0	650	3	521	326	1643	0	0	1196	418
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1752	1752	1752	1841	1841	0	0	1856	1856
Adj Flow Rate, veh/h				813	0	348	326	1643	0	0	1196	418
Peak Hour Factor				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %				10	10	10	4	4	0	0	3	3
Cap, veh/h				1054	0	469	461	2789	0	0	2265	558
Arrive On Green				0.32	0.00	0.32	0.14	0.55	0.00	0.00	0.35	0.35
Sat Flow, veh/h				3337	0	1485	3401	5191	0	0	6643	1572
Grp Volume(v), veh/h				813	0	348	326	1643	0	0	1196	418
Grp Sat Flow(s),veh/h/ln				1668	0	1485	1700	1675	0	0	1596	1572
Q Serve(g_s), s				17.1	0.0	16.2	7.1	16.8	0.0	0.0	11.5	18.1
Cycle Q Clear(g_c), s				17.1	0.0	16.2	7.1	16.8	0.0	0.0	11.5	18.1
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				1054	0	469	461	2789	0	0	2265	558
V/C Ratio(X)				0.77	0.00	0.74	0.71	0.59	0.00	0.00	0.53	0.75
Avail Cap(c_a), veh/h				1593	0	709	614	2789	0	0	2265	558
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				24.0	0.0	23.7	32.0	11.4	0.0	0.0	19.8	22.0
Incr Delay (d2), s/veh				1.3	0.0	2.3	2.4	0.9	0.0	0.0	0.9	8.9
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				6.6	0.0	5.7	2.8	4.8	0.0	0.0	3.8	7.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				25.3	0.0	26.0	34.5	12.3	0.0	0.0	20.7	30.9
LnGrp LOS				C	A	C	C	B	A	A	C	C
Approach Vol, veh/h					1161			1969			1614	
Approach Delay, s/veh					25.5			16.0			23.4	
Approach LOS					C			B			C	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		48.0			15.5	32.5		29.5				
Change Period (Y+Rc), s		6.0			6.0	6.0		6.0				
Max Green Setting (Gmax), s		42.0			13.0	23.0		36.0				
Max Q Clear Time (g_c+I1), s		18.8			9.1	20.1		19.1				
Green Ext Time (p_c), s		11.7			0.4	2.1		4.4				
Intersection Summary												
HCM 6th Ctrl Delay			20.8									
HCM 6th LOS			C									

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	618	0	463	0	0	0	0	1374	645	481	1391	0
Future Volume (veh/h)	618	0	463	0	0	0	0	1374	645	481	1391	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1767	1767	1767				0	1781	1781	1796	1796	0
Adj Flow Rate, veh/h	762	0	309				0	1374	645	481	1391	0
Peak Hour Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	9	9	9				0	8	8	7	7	0
Cap, veh/h	823	0	366				0	1412	648	516	2199	0
Arrive On Green	0.24	0.00	0.24				0.00	0.43	0.43	0.16	0.64	0.00
Sat Flow, veh/h	3365	0	1497				0	3419	1496	3319	3503	0
Grp Volume(v), veh/h	762	0	309				0	1367	652	481	1391	0
Grp Sat Flow(s),veh/h/ln	1682	0	1497				0	1621	1512	1659	1706	0
Q Serve(g_s), s	19.9	0.0	17.7				0.0	37.2	38.7	12.9	22.0	0.0
Cycle Q Clear(g_c), s	19.9	0.0	17.7				0.0	37.2	38.7	12.9	22.0	0.0
Prop In Lane	1.00		1.00				0.00		0.99	1.00		0.00
Lane Grp Cap(c), veh/h	823	0	366				0	1405	655	516	2199	0
V/C Ratio(X)	0.93	0.00	0.84				0.00	0.97	1.00	0.93	0.63	0.00
Avail Cap(c_a), veh/h	823	0	366				0	1405	655	516	2199	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	33.2	0.0	32.4				0.0	25.0	25.4	37.5	9.6	0.0
Incr Delay (d2), s/veh	16.3	0.0	16.4				0.0	18.4	34.0	23.9	1.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.7	0.0	7.9				0.0	15.6	17.8	6.5	6.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.5	0.0	48.7				0.0	43.4	59.4	61.4	11.0	0.0
LnGrp LOS	D	A	D				A	D	E	E	B	A
Approach Vol, veh/h		1071						2019			1872	
Approach Delay, s/veh		49.3						48.5			24.0	
Approach LOS		D						D			C	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	19.0	44.0		27.0		63.0						
Change Period (Y+Rc), s	6.0	6.0		6.0		6.0						
Max Green Setting (Gmax), s	13.0	38.0		21.0		57.0						
Max Q Clear Time (g_c+I1), s	14.9	40.7		21.9		24.0						
Green Ext Time (p_c), s	0.0	0.0		0.0		11.4						
Intersection Summary												
HCM 6th Ctrl Delay			39.4									
HCM 6th LOS			D									

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	431	124	155	34	31	76	36	1450	23	28	1524	298
Future Volume (veh/h)	431	124	155	34	31	76	36	1450	23	28	1524	298
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1411	1411	1411	1767	1767	1767	1707	1707	1707
Adj Flow Rate, veh/h	431	124	155	34	31	76	36	1450	23	28	1524	298
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	7	7	7	33	33	33	9	9	9	13	13	13
Cap, veh/h	403	552	467	294	412	367	75	1633	26	64	1298	248
Arrive On Green	0.31	0.31	0.31	0.31	0.31	0.31	0.04	0.48	0.48	0.04	0.48	0.48
Sat Flow, veh/h	1236	1796	1522	830	1340	1196	1682	3382	54	1626	2718	518
Grp Volume(v), veh/h	431	124	155	34	31	76	36	719	754	28	894	928
Grp Sat Flow(s),veh/h/ln	1236	1796	1522	830	1340	1196	1682	1678	1757	1626	1622	1614
Q Serve(g_s), s	22.9	4.5	6.9	2.8	1.4	4.1	1.8	34.1	34.2	1.5	42.0	42.0
Cycle Q Clear(g_c), s	27.0	4.5	6.9	7.3	1.4	4.1	1.8	34.1	34.2	1.5	42.0	42.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.03	1.00		0.32
Lane Grp Cap(c), veh/h	403	552	467	294	412	367	75	810	848	64	775	771
V/C Ratio(X)	1.07	0.22	0.33	0.12	0.08	0.21	0.48	0.89	0.89	0.44	1.15	1.20
Avail Cap(c_a), veh/h	403	552	467	294	412	367	115	810	848	111	775	771
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.9	22.7	23.5	25.4	21.6	22.5	41.0	20.6	20.6	41.3	23.0	23.0
Incr Delay (d2), s/veh	64.3	0.2	0.4	0.2	0.1	0.3	4.7	11.7	11.4	4.6	83.6	103.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.6	1.8	2.4	0.5	0.4	1.1	0.8	13.5	14.1	0.6	31.0	35.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	99.2	22.9	23.9	25.6	21.7	22.8	45.7	32.3	32.0	45.8	106.6	126.8
LnGrp LOS	F	C	C	C	C	C	D	C	C	D	F	F
Approach Vol, veh/h		710			141			1509			1850	
Approach Delay, s/veh		69.4			23.2			32.5			115.8	
Approach LOS		E			C			C			F	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.5	47.4		32.0	8.9	47.0		32.0
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0
Max Green Setting (Gmax), s	5.0	41.0		26.0	5.0	41.0		26.0
Max Q Clear Time (g_c+I1), s	3.5	36.2		29.0	3.8	44.0		9.3
Green Ext Time (p_c), s	0.0	3.3		0.0	0.0	0.0		0.6

Intersection Summary			
HCM 6th Ctrl Delay			75.0
HCM 6th LOS			E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	111	16	98	40	20	68	88	1302	20	57	1567	81
Future Volume (veh/h)	111	16	98	40	20	68	88	1302	20	57	1567	81
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1707	1707	1707	1633	1633	1633	1752	1752	1752	1707	1707	1707
Adj Flow Rate, veh/h	111	16	98	40	20	68	88	1302	20	57	1567	81
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	13	13	13	18	18	18	10	10	10	13	13	13
Cap, veh/h	183	31	116	267	325	275	118	1912	29	90	1741	90
Arrive On Green	0.20	0.20	0.20	0.20	0.20	0.20	0.07	0.57	0.57	0.06	0.55	0.55
Sat Flow, veh/h	603	155	585	1116	1633	1384	1668	3355	52	1626	3139	162
Grp Volume(v), veh/h	225	0	0	40	20	68	88	646	676	57	807	841
Grp Sat Flow(s),veh/h/ln	1343	0	0	1116	1633	1384	1668	1664	1743	1626	1622	1678
Q Serve(g_s), s	12.4	0.0	0.0	0.0	0.8	3.5	4.4	23.2	23.2	2.9	37.5	38.1
Cycle Q Clear(g_c), s	13.7	0.0	0.0	3.3	0.8	3.5	4.4	23.2	23.2	2.9	37.5	38.1
Prop In Lane	0.49		0.44	1.00		1.00	1.00		0.03	1.00		0.10
Lane Grp Cap(c), veh/h	330	0	0	267	325	275	118	948	993	90	899	931
V/C Ratio(X)	0.68	0.00	0.00	0.15	0.06	0.25	0.75	0.68	0.68	0.63	0.90	0.90
Avail Cap(c_a), veh/h	362	0	0	294	364	309	118	958	1003	134	952	985
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.7	0.0	0.0	28.6	27.7	28.7	38.8	12.9	12.9	39.4	16.8	16.9
Incr Delay (d2), s/veh	4.6	0.0	0.0	0.3	0.1	0.5	23.0	2.0	1.9	7.2	10.7	11.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.6	0.0	0.0	0.7	0.3	1.1	2.4	7.0	7.3	1.3	13.2	13.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.3	0.0	0.0	28.9	27.7	29.2	61.8	14.8	14.8	46.6	27.5	28.1
LnGrp LOS	D	A	A	C	C	C	E	B	B	D	C	C
Approach Vol, veh/h		225			128			1410			1705	
Approach Delay, s/veh		37.3			28.9			17.7			28.4	
Approach LOS		D			C			B			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.7	53.5		21.9	11.0	52.2		21.9				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	6.0	48.0		18.0	5.0	49.0		18.0				
Max Q Clear Time (g_c+I1), s	4.9	25.2		15.7	6.4	40.1		5.5				
Green Ext Time (p_c), s	0.0	8.4		0.3	0.0	6.1		0.3				
Intersection Summary												
HCM 6th Ctrl Delay			24.7									
HCM 6th LOS			C									

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	3	36	1297	9	37	1695
Future Vol, veh/h	3	36	1297	9	37	1695
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	200	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	32	32	9	9	12	12
Mvmt Flow	3	36	1297	9	37	1695

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2224	653	0	0	1306	0
Stage 1	1302	-	-	-	-	-
Stage 2	922	-	-	-	-	-
Critical Hdwy	7.44	7.54	-	-	4.34	-
Critical Hdwy Stg 1	6.44	-	-	-	-	-
Critical Hdwy Stg 2	6.44	-	-	-	-	-
Follow-up Hdwy	3.82	3.62	-	-	2.32	-
Pot Cap-1 Maneuver	25	345	-	-	475	-
Stage 1	169	-	-	-	-	-
Stage 2	284	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	23	345	-	-	475	-
Mov Cap-2 Maneuver	104	-	-	-	-	-
Stage 1	169	-	-	-	-	-
Stage 2	262	-	-	-	-	-

Approach	WB		NB		SB	
HCM Control Delay, s	19.2		0		0.3	
HCM LOS	C					

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	293	475	-
HCM Lane V/C Ratio	-	-	0.133	0.078	-
HCM Control Delay (s)	-	-	19.2	13.2	-
HCM Lane LOS	-	-	C	B	-
HCM 95th %tile Q(veh)	-	-	0.5	0.3	-

Movement	EBL	EBR	NBU	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (veh/h)	31	161	2	102	1259	1637	55
Future Volume (veh/h)	31	161	2	102	1259	1637	55
Initial Q (Qb), veh	0	0		0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00			1.00
Parking Bus, Adj	1.00	1.00		1.00	1.00	1.00	1.00
Work Zone On Approach	No				No	No	
Adj Sat Flow, veh/h/ln	1870	1870		1870	1870	1870	1870
Adj Flow Rate, veh/h	31	161		102	1259	1637	55
Peak Hour Factor	1.00	1.00		1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2		2	2	2	2
Cap, veh/h	243	217		151	2636	2156	72
Arrive On Green	0.14	0.14		0.08	0.74	0.61	0.61
Sat Flow, veh/h	1781	1585		1781	3647	3602	118
Grp Volume(v), veh/h	31	161		102	1259	826	866
Grp Sat Flow(s),veh/h/ln	1781	1585		1781	1777	1777	1849
Q Serve(g_s), s	1.3	8.0		4.6	11.7	27.6	27.9
Cycle Q Clear(g_c), s	1.3	8.0		4.6	11.7	27.6	27.9
Prop In Lane	1.00	1.00		1.00			0.06
Lane Grp Cap(c), veh/h	243	217		151	2636	1092	1136
V/C Ratio(X)	0.13	0.74		0.68	0.48	0.76	0.76
Avail Cap(c_a), veh/h	412	366		193	2636	1092	1136
HCM Platoon Ratio	1.00	1.00		1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00		1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.2	34.1		36.6	4.2	11.4	11.5
Incr Delay (d2), s/veh	0.2	5.0		6.3	0.6	4.9	4.8
Initial Q Delay(d3),s/veh	0.0	0.0		0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.3		2.2	3.2	10.6	11.1
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	31.4	39.1		42.8	4.9	16.3	16.3
LnGrp LOS	C	D		D	A	B	B
Approach Vol, veh/h	192				1361	1692	
Approach Delay, s/veh	37.9				7.7	16.3	
Approach LOS	D				A	B	
Timer - Assigned Phs		2		4	5	6	
Phs Duration (G+Y+Rc), s		66.0		16.2	10.5	55.5	
Change Period (Y+Rc), s		6.0		6.0	4.5	6.0	
Max Green Setting (Gmax), s		60.0		18.0	7.9	47.6	
Max Q Clear Time (g_c+I1), s		13.7		10.0	6.6	29.9	
Green Ext Time (p_c), s		13.2		0.3	0.0	11.8	
Intersection Summary							
HCM 6th Ctrl Delay			14.0				
HCM 6th LOS			B				
Notes							

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	253	46	74	7	1	6	28	1080	24	22	1222	249
Future Volume (veh/h)	253	46	74	7	1	6	28	1080	24	22	1222	249
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1648	1648	1648	1826	1826	1826	1737	1737	1737	1678	1678	1678
Adj Flow Rate, veh/h	253	46	74	7	1	6	28	1080	24	22	1222	249
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	17	17	17	5	5	5	11	11	11	15	15	15
Cap, veh/h	344	136	219	165	33	115	56	1998	44	48	1590	321
Arrive On Green	0.24	0.24	0.24	0.24	0.24	0.24	0.07	1.00	1.00	0.03	0.60	0.60
Sat Flow, veh/h	1241	569	915	501	139	480	1654	3301	73	1598	2642	533
Grp Volume(v), veh/h	253	0	120	14	0	0	28	540	564	22	733	738
Grp Sat Flow(s),veh/h/ln	1241	0	1483	1120	0	0	1654	1650	1724	1598	1594	1582
Q Serve(g_s), s	16.9	0.0	8.0	0.1	0.0	0.0	2.0	0.0	0.0	1.6	40.7	41.8
Cycle Q Clear(g_c), s	25.0	0.0	8.0	8.1	0.0	0.0	2.0	0.0	0.0	1.6	40.7	41.8
Prop In Lane	1.00		0.62	0.50		0.43	1.00		0.04	1.00		0.34
Lane Grp Cap(c), veh/h	344	0	355	313	0	0	56	999	1044	48	959	952
V/C Ratio(X)	0.74	0.00	0.34	0.04	0.00	0.00	0.50	0.54	0.54	0.46	0.76	0.78
Avail Cap(c_a), veh/h	388	0	408	363	0	0	83	999	1044	80	959	952
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.62	0.62	0.62
Uniform Delay (d), s/veh	44.6	0.0	37.7	35.1	0.0	0.0	55.0	0.0	0.0	57.2	17.6	17.8
Incr Delay (d2), s/veh	6.3	0.0	0.6	0.1	0.0	0.0	6.9	2.1	2.0	4.2	3.6	3.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.9	0.0	3.0	0.3	0.0	0.0	0.9	0.6	0.6	0.7	13.5	13.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.9	0.0	38.3	35.2	0.0	0.0	61.9	2.1	2.0	61.4	21.3	21.7
LnGrp LOS	D	A	D	D	A	A	E	A	A	E	C	C
Approach Vol, veh/h		373			14			1132			1493	
Approach Delay, s/veh		46.8			35.2			3.5			22.1	
Approach LOS		D			D			A			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.6	77.6		33.8	9.0	77.2		33.8				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	5.0	65.0		32.0	5.0	65.0		32.0				
Max Q Clear Time (g_c+I1), s	3.6	2.0		27.0	4.0	43.8		10.1				
Green Ext Time (p_c), s	0.0	7.6		0.8	0.0	9.7		0.0				
Intersection Summary												
HCM 6th Ctrl Delay			18.2									
HCM 6th LOS			B									

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	35	1112	7	9	1293
Future Vol, veh/h	0	35	1112	7	9	1293
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	35	1112	7	9	1293

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	560	0	0	1119	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	4.14	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	0	472	-	-	620	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	472	-	-	620	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.2	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	472	620	-
HCM Lane V/C Ratio	-	-	0.074	0.015	-
HCM Control Delay (s)	-	-	13.2	10.9	-
HCM Lane LOS	-	-	B	B	-
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	165	423	184	76	175	111	132	754	82	105	1015	144
Future Volume (veh/h)	165	423	184	76	175	111	132	754	82	105	1015	144
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1767	1767	1767	1604	1604	1604	1767	1767	1767	1781	1781	1781
Adj Flow Rate, veh/h	165	423	184	76	175	111	132	754	82	105	1015	144
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	9	9	9	20	20	20	9	9	9	8	8	8
Cap, veh/h	205	468	396	105	387	233	169	1277	139	139	1352	603
Arrive On Green	0.12	0.26	0.26	0.07	0.21	0.21	0.10	0.42	0.42	0.16	0.80	0.80
Sat Flow, veh/h	1682	1767	1497	1527	1829	1100	1682	3053	332	1697	3385	1510
Grp Volume(v), veh/h	165	423	184	76	144	142	132	414	422	105	1015	144
Grp Sat Flow(s),veh/h/ln	1682	1767	1497	1527	1523	1406	1682	1678	1707	1697	1692	1510
Q Serve(g_s), s	11.5	27.8	12.4	5.9	9.9	10.6	9.2	22.9	22.9	7.1	18.1	2.8
Cycle Q Clear(g_c), s	11.5	27.8	12.4	5.9	9.9	10.6	9.2	22.9	22.9	7.1	18.1	2.8
Prop In Lane	1.00		1.00	1.00		0.78	1.00		0.19	1.00		1.00
Lane Grp Cap(c), veh/h	205	468	396	105	322	297	169	702	714	139	1352	603
V/C Ratio(X)	0.81	0.90	0.46	0.73	0.45	0.48	0.78	0.59	0.59	0.76	0.75	0.24
Avail Cap(c_a), veh/h	294	501	424	115	322	297	182	702	714	156	1352	603
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.3	42.7	37.0	54.8	41.2	41.5	52.7	27.0	27.0	49.0	9.1	7.5
Incr Delay (d2), s/veh	10.1	19.1	0.8	18.6	1.0	1.2	18.1	3.6	3.6	17.0	3.9	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.3	14.1	4.5	2.7	3.7	3.7	4.6	9.2	9.3	3.4	3.7	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.4	61.8	37.8	73.4	42.2	42.7	70.7	30.6	30.5	66.0	12.9	8.5
LnGrp LOS	E	E	D	E	D	D	E	C	C	E	B	A
Approach Vol, veh/h		772			362			968			1264	
Approach Delay, s/veh		56.0			48.9			36.0			16.8	
Approach LOS		E			D			D			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.8	55.2	13.2	36.8	17.1	52.9	19.6	30.4
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	10.0	45.0	8.0	33.0	12.0	43.0	20.0	21.0
Max Q Clear Time (g_c+I1), s	9.1	24.9	7.9	29.8	11.2	20.1	13.5	12.6
Green Ext Time (p_c), s	0.0	4.4	0.0	1.0	0.0	7.1	0.2	0.9

Intersection Summary	
HCM 6th Ctrl Delay	34.8
HCM 6th LOS	C

Intersection						
Int Delay, s/veh	1.7					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	5	73	19	16	12
Future Vol, veh/h	5	5	73	19	16	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	50	50	50	50	50	50
Mvmt Flow	5	5	73	19	16	12

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	127	83	0	0	92	0
Stage 1	83	-	-	-	-	-
Stage 2	44	-	-	-	-	-
Critical Hdwy	6.9	6.7	-	-	4.6	-
Critical Hdwy Stg 1	5.9	-	-	-	-	-
Critical Hdwy Stg 2	5.9	-	-	-	-	-
Follow-up Hdwy	3.95	3.75	-	-	2.65	-
Pot Cap-1 Maneuver	765	859	-	-	1249	-
Stage 1	832	-	-	-	-	-
Stage 2	869	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	755	859	-	-	1249	-
Mov Cap-2 Maneuver	755	-	-	-	-	-
Stage 1	832	-	-	-	-	-
Stage 2	858	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.5	0	4.5
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	804	1249	-
HCM Lane V/C Ratio	-	-	0.012	0.013	-
HCM Control Delay (s)	-	-	9.5	7.9	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection						
Int Delay, s/veh	3.1					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	275	146	70	208	81	92
Future Vol, veh/h	275	146	70	208	81	92
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	200	-	200	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	275	146	70	208	81	92

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	421	0	696	348
Stage 1	-	-	-	-	348	-
Stage 2	-	-	-	-	348	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1138	-	408	695
Stage 1	-	-	-	-	715	-
Stage 2	-	-	-	-	715	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1138	-	383	695
Mov Cap-2 Maneuver	-	-	-	-	490	-
Stage 1	-	-	-	-	715	-
Stage 2	-	-	-	-	671	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.1	12.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	490	695	-	-	1138	-
HCM Lane V/C Ratio	0.165	0.132	-	-	0.062	-
HCM Control Delay (s)	13.8	11	-	-	8.4	-
HCM Lane LOS	B	B	-	-	A	-
HCM 95th %tile Q(veh)	0.6	0.5	-	-	0.2	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	192	570	186	177	38	371	657	166	65	1208	30
Future Volume (veh/h)	38	192	570	186	177	38	371	657	166	65	1208	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	38	192	570	186	177	38	371	657	166	65	1208	30
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	81	766	564	238	1079	481	486	1493	371	103	1453	36
Arrive On Green	0.05	0.22	0.22	0.13	0.30	0.30	0.14	0.37	0.37	0.06	0.28	0.28
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	3456	4078	1014	1781	5124	127
Grp Volume(v), veh/h	38	192	570	186	177	38	371	547	276	65	802	436
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1728	1702	1688	1781	1702	1847
Q Serve(g_s), s	1.8	4.0	19.0	8.9	3.2	1.5	9.1	10.7	10.9	3.1	19.5	19.5
Cycle Q Clear(g_c), s	1.8	4.0	19.0	8.9	3.2	1.5	9.1	10.7	10.9	3.1	19.5	19.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.60	1.00		0.07
Lane Grp Cap(c), veh/h	81	766	564	238	1079	481	486	1246	618	103	965	524
V/C Ratio(X)	0.47	0.25	1.01	0.78	0.16	0.08	0.76	0.44	0.45	0.63	0.83	0.83
Avail Cap(c_a), veh/h	121	766	564	242	1079	481	549	1246	618	162	965	524
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.0	28.7	28.4	36.9	22.5	21.9	36.5	21.1	21.2	40.6	29.6	29.6
Incr Delay (d2), s/veh	4.1	0.2	40.4	14.8	0.1	0.1	5.6	1.1	2.3	6.2	8.3	14.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	1.7	17.6	4.8	1.3	0.6	4.2	4.3	4.6	1.5	8.8	10.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.2	28.9	68.8	51.8	22.6	22.0	42.1	22.2	23.5	46.8	37.9	43.9
LnGrp LOS	D	C	F	D	C	C	D	C	C	D	D	D
Approach Vol, veh/h		800			401			1194			1303	
Approach Delay, s/veh		58.1			36.1			28.7			40.4	
Approach LOS		E			D			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.1	37.3	16.8	24.0	17.4	30.0	9.0	31.8
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	7.0	30.0	11.0	18.0	13.0	24.0	5.0	24.0
Max Q Clear Time (g_c+I1), s	5.1	12.9	10.9	21.0	11.1	21.5	3.8	5.2
Green Ext Time (p_c), s	0.0	5.2	0.0	0.0	0.3	1.8	0.0	1.1

Intersection Summary	
HCM 6th Ctrl Delay	40.0
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	605	5	390	340	961	0	0	1116	577
Future Volume (veh/h)	0	0	0	605	5	390	340	961	0	0	1116	577
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1737	1737	1737	1678	1678	0	0	1870	1870
Adj Flow Rate, veh/h				728	0	262	340	961	0	0	1116	577
Peak Hour Factor				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %				11	11	11	15	15	0	0	2	2
Cap, veh/h				922	0	410	451	2744	0	0	2525	622
Arrive On Green				0.28	0.00	0.28	0.15	0.60	0.00	0.00	0.39	0.39
Sat Flow, veh/h				3309	0	1472	3100	4731	0	0	6696	1585
Grp Volume(v), veh/h				728	0	262	340	961	0	0	1116	577
Grp Sat Flow(s),veh/h/ln				1654	0	1472	1550	1527	0	0	1609	1585
Q Serve(g_s), s				16.6	0.0	12.8	8.6	8.7	0.0	0.0	10.4	28.4
Cycle Q Clear(g_c), s				16.6	0.0	12.8	8.6	8.7	0.0	0.0	10.4	28.4
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				922	0	410	451	2744	0	0	2525	622
V/C Ratio(X)				0.79	0.00	0.64	0.75	0.35	0.00	0.00	0.44	0.93
Avail Cap(c_a), veh/h				1254	0	558	531	2744	0	0	2525	622
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				27.3	0.0	25.9	33.5	8.3	0.0	0.0	18.3	23.7
Incr Delay (d2), s/veh				2.4	0.0	1.7	5.1	0.4	0.0	0.0	0.6	22.1
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				6.6	0.0	4.5	3.3	2.2	0.0	0.0	3.4	12.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				29.7	0.0	27.5	38.7	8.7	0.0	0.0	18.8	45.8
LnGrp LOS				C	A	C	D	A	A	A	B	D
Approach Vol, veh/h					990			1301			1693	
Approach Delay, s/veh					29.2			16.5			28.0	
Approach LOS					C			B			C	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		54.0			16.9	37.1		27.8				
Change Period (Y+Rc), s		6.0			6.0	6.0		6.0				
Max Green Setting (Gmax), s		48.0			13.0	29.0		30.0				
Max Q Clear Time (g_c+I1), s		10.7			10.6	30.4		18.6				
Green Ext Time (p_c), s		6.8			0.3	0.0		3.1				
Intersection Summary												
HCM 6th Ctrl Delay			24.5									
HCM 6th LOS			C									

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	350	8	525	0	0	0	0	948	429	415	1308	0
Future Volume (veh/h)	350	8	525	0	0	0	0	948	429	415	1308	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1693	1693	1693				0	1574	1574	1796	1796	0
Adj Flow Rate, veh/h	236	0	652				0	948	429	415	1308	0
Peak Hour Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	14	14	14				0	22	22	7	7	0
Cap, veh/h	425	0	756				0	1189	538	516	2126	0
Arrive On Green	0.26	0.00	0.26				0.00	0.41	0.41	0.16	0.62	0.00
Sat Flow, veh/h	1612	0	2869				0	3036	1309	3319	3503	0
Grp Volume(v), veh/h	236	0	652				0	938	439	415	1308	0
Grp Sat Flow(s),veh/h/ln	1612	0	1434				0	1432	1338	1659	1706	0
Q Serve(g_s), s	11.1	0.0	19.1				0.0	25.3	25.3	10.7	20.7	0.0
Cycle Q Clear(g_c), s	11.1	0.0	19.1				0.0	25.3	25.3	10.7	20.7	0.0
Prop In Lane	1.00		1.00				0.00		0.98	1.00		0.00
Lane Grp Cap(c), veh/h	425	0	756				0	1177	550	516	2126	0
V/C Ratio(X)	0.56	0.00	0.86				0.00	0.80	0.80	0.80	0.62	0.00
Avail Cap(c_a), veh/h	456	0	812				0	1177	550	526	2126	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	28.0	0.0	31.0				0.0	22.8	22.8	36.0	10.2	0.0
Incr Delay (d2), s/veh	1.3	0.0	9.0				0.0	5.7	11.4	8.7	1.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.3	0.0	7.3				0.0	8.2	8.5	4.6	5.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.3	0.0	39.9				0.0	28.4	34.2	44.7	11.5	0.0
LnGrp LOS	C	A	D				A	C	C	D	B	A
Approach Vol, veh/h		888						1377			1723	
Approach Delay, s/veh		37.1						30.3			19.5	
Approach LOS		D						C			B	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	18.7	41.3		28.3		60.0
Change Period (Y+Rc), s	6.0	6.0		6.0		6.0
Max Green Setting (Gmax), s	13.0	35.0		24.0		54.0
Max Q Clear Time (g_c+I1), s	12.7	27.3		21.1		22.7
Green Ext Time (p_c), s	0.1	4.7		1.2		10.2

Intersection Summary	
HCM 6th Ctrl Delay	27.1
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	266	21	79	35	29	31	89	1009	31	38	1335	446
Future Volume (veh/h)	266	21	79	35	29	31	89	1009	31	38	1335	446
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1693	1693	1693	1455	1455	1455	1500	1500	1500	1722	1722	1722
Adj Flow Rate, veh/h	266	21	79	35	29	31	89	1009	31	38	1335	446
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	14	14	14	30	30	30	27	27	27	12	12	12
Cap, veh/h	316	361	306	286	295	263	96	1616	50	75	1340	431
Arrive On Green	0.21	0.21	0.21	0.21	0.21	0.21	0.07	0.57	0.57	0.05	0.55	0.55
Sat Flow, veh/h	1215	1693	1434	1008	1383	1233	1428	2822	87	1640	2435	783
Grp Volume(v), veh/h	266	21	79	35	29	31	89	509	531	38	880	901
Grp Sat Flow(s),veh/h/ln	1215	1693	1434	1008	1383	1233	1428	1425	1484	1640	1636	1581
Q Serve(g_s), s	17.2	0.9	4.1	2.6	1.5	1.8	5.5	21.2	21.2	2.0	46.5	49.0
Cycle Q Clear(g_c), s	19.0	0.9	4.1	3.4	1.5	1.8	5.5	21.2	21.2	2.0	46.5	49.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.06	1.00		0.49
Lane Grp Cap(c), veh/h	316	361	306	286	295	263	96	816	850	75	901	871
V/C Ratio(X)	0.84	0.06	0.26	0.12	0.10	0.12	0.92	0.62	0.62	0.51	0.98	1.04
Avail Cap(c_a), veh/h	316	361	306	286	295	263	96	816	850	111	901	871
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.9	27.9	29.1	29.2	28.1	28.2	41.3	12.7	12.7	41.5	19.4	20.0
Incr Delay (d2), s/veh	18.3	0.1	0.4	0.2	0.1	0.2	67.4	1.5	1.4	5.3	24.3	39.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.2	0.3	1.4	0.6	0.5	0.5	3.6	5.5	5.8	0.9	19.6	23.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.2	27.9	29.6	29.4	28.3	28.4	108.7	14.2	14.1	46.8	43.8	59.9
LnGrp LOS	E	C	C	C	C	C	F	B	B	D	D	F
Approach Vol, veh/h		366			95			1129			1819	
Approach Delay, s/veh		48.1			28.7			21.6			51.8	
Approach LOS		D			C			C			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.0	56.0		24.0	11.0	54.0		24.0				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	5.0	49.0		18.0	5.0	48.0		18.0				
Max Q Clear Time (g_c+I1), s	4.0	23.2		21.0	7.5	51.0		5.4				
Green Ext Time (p_c), s	0.0	6.4		0.0	0.0	0.0		0.3				
Intersection Summary												
HCM 6th Ctrl Delay			40.8									
HCM 6th LOS			D									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	68	55	65	35	50	87	89	998	33	65	1230	132
Future Volume (veh/h)	68	55	65	35	50	87	89	998	33	65	1230	132
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1411	1411	1411	625	625	625	1574	1574	1574	1678	1678	1678
Adj Flow Rate, veh/h	68	55	65	35	50	87	89	998	33	65	1230	132
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	33	33	33	86	86	86	22	22	22	15	15	15
Cap, veh/h	126	88	79	160	137	116	126	1548	51	100	1459	156
Arrive On Green	0.22	0.22	0.22	0.22	0.22	0.22	0.08	0.52	0.52	0.06	0.50	0.50
Sat Flow, veh/h	283	401	362	425	625	530	1499	2954	98	1598	2905	311
Grp Volume(v), veh/h	188	0	0	35	50	87	89	505	526	65	673	689
Grp Sat Flow(s),veh/h/ln	1046	0	0	425	625	530	1499	1495	1556	1598	1594	1622
Q Serve(g_s), s	8.3	0.0	0.0	0.0	5.2	11.8	4.4	18.7	18.7	3.1	28.0	28.3
Cycle Q Clear(g_c), s	13.5	0.0	0.0	8.7	5.2	11.8	4.4	18.7	18.7	3.1	28.0	28.3
Prop In Lane	0.36		0.35	1.00		1.00	1.00		0.06	1.00		0.19
Lane Grp Cap(c), veh/h	292	0	0	160	137	116	126	784	816	100	801	815
V/C Ratio(X)	0.64	0.00	0.00	0.22	0.37	0.75	0.70	0.64	0.64	0.65	0.84	0.85
Avail Cap(c_a), veh/h	339	0	0	178	162	138	156	874	910	208	973	990
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.0	0.0	0.0	26.9	25.6	28.1	34.3	13.2	13.2	35.3	16.5	16.6
Incr Delay (d2), s/veh	3.3	0.0	0.0	0.7	1.6	17.2	10.3	1.4	1.3	6.9	5.7	5.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	0.0	0.0	0.6	0.8	1.9	1.8	5.0	5.2	1.3	9.0	9.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.2	0.0	0.0	27.6	27.2	45.4	44.6	14.6	14.5	42.1	22.2	22.4
LnGrp LOS	C	A	A	C	C	D	D	B	B	D	C	C
Approach Vol, veh/h		188			172			1120			1427	
Approach Delay, s/veh		32.2			36.5			16.9			23.2	
Approach LOS		C			D			B			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.8	45.4		21.8	11.5	43.7		21.8				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	9.0	44.0		19.0	7.0	46.0		19.0				
Max Q Clear Time (g_c+I1), s	5.1	20.7		15.5	6.4	30.3		13.8				
Green Ext Time (p_c), s	0.0	6.1		0.3	0.0	7.4		0.4				
Intersection Summary												
HCM 6th Ctrl Delay			22.2									
HCM 6th LOS			C									

Intersection	
Int Delay, s/veh	1.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	66	1029	7	146	1157
Future Vol, veh/h	0	66	1029	7	146	1157
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	200	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	59	59	20	20	15	15
Mvmt Flow	0	66	1029	7	146	1157

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1904	518	0	0	1036	0
Stage 1	1033	-	-	-	-	-
Stage 2	871	-	-	-	-	-
Critical Hdwy	7.98	8.08	-	-	4.4	-
Critical Hdwy Stg 1	6.98	-	-	-	-	-
Critical Hdwy Stg 2	6.98	-	-	-	-	-
Follow-up Hdwy	4.09	3.89	-	-	2.35	-
Pot Cap-1 Maneuver	32	378	-	-	594	-
Stage 1	202	-	-	-	-	-
Stage 2	256	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	24	378	-	-	594	-
Mov Cap-2 Maneuver	101	-	-	-	-	-
Stage 1	202	-	-	-	-	-
Stage 2	193	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.5	0	1.5
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	378	594	-
HCM Lane V/C Ratio	-	-	0.175	0.246	-
HCM Control Delay (s)	-	-	16.5	13	-
HCM Lane LOS	-	-	C	B	-
HCM 95th %tile Q(veh)	-	-	0.6	1	-

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	59	141	78	1004	1134	44
Future Volume (veh/h)	59	141	78	1004	1134	44
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	59	141	78	1004	1134	44
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	225	201	122	2661	2219	86
Arrive On Green	0.13	0.13	0.07	0.75	0.64	0.64
Sat Flow, veh/h	1781	1585	1781	3647	3581	135
Grp Volume(v), veh/h	59	141	78	1004	578	600
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1777	1777	1846
Q Serve(g_s), s	2.4	6.8	3.4	7.9	14.0	14.0
Cycle Q Clear(g_c), s	2.4	6.8	3.4	7.9	14.0	14.0
Prop In Lane	1.00	1.00	1.00			0.07
Lane Grp Cap(c), veh/h	225	201	122	2661	1131	1175
V/C Ratio(X)	0.26	0.70	0.64	0.38	0.51	0.51
Avail Cap(c_a), veh/h	445	396	233	2661	1131	1175
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.6	33.6	36.3	3.5	7.9	7.9
Incr Delay (d2), s/veh	0.6	4.4	5.4	0.4	1.7	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.2	1.6	2.0	5.0	5.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	32.2	38.0	41.8	3.9	9.5	9.4
LnGrp LOS	C	D	D	A	A	A
Approach Vol, veh/h	200			1082	1178	
Approach Delay, s/veh	36.3			6.7	9.5	
Approach LOS	D			A	A	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		65.0		15.1	9.0	56.0
Change Period (Y+Rc), s		6.0		6.0	4.5	6.0
Max Green Setting (Gmax), s		59.0		19.0	9.5	45.0
Max Q Clear Time (g_c+I1), s		9.9		8.8	5.4	16.0
Green Ext Time (p_c), s		9.4		0.4	0.0	9.5

Intersection Summary			
HCM 6th Ctrl Delay			10.4
HCM 6th LOS			B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	204	45	29	29	5	5	34	960	69	8	1213	250
Future Volume (veh/h)	204	45	29	29	5	5	34	960	69	8	1213	250
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1337	1337	1337	1085	1085	1085	1633	1633	1633	1633	1633	1633
Adj Flow Rate, veh/h	204	45	29	29	5	5	34	960	69	8	1213	250
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	38	38	38	55	55	55	18	18	18	18	18	18
Cap, veh/h	289	172	111	161	24	19	57	1849	133	28	1569	320
Arrive On Green	0.23	0.23	0.23	0.23	0.23	0.23	0.07	1.00	1.00	0.02	0.61	0.61
Sat Flow, veh/h	1004	759	489	477	106	86	1555	2936	211	1555	2566	524
Grp Volume(v), veh/h	204	0	74	39	0	0	34	507	522	8	729	734
Grp Sat Flow(s),veh/h/ln	1004	0	1249	668	0	0	1555	1552	1595	1555	1552	1539
Q Serve(g_s), s	13.6	0.0	5.8	4.0	0.0	0.0	2.5	0.0	0.0	0.6	41.3	42.5
Cycle Q Clear(g_c), s	23.5	0.0	5.8	9.8	0.0	0.0	2.5	0.0	0.0	0.6	41.3	42.5
Prop In Lane	1.00		0.39	0.74		0.13	1.00		0.13	1.00		0.34
Lane Grp Cap(c), veh/h	289	0	284	204	0	0	57	977	1005	28	949	941
V/C Ratio(X)	0.71	0.00	0.26	0.19	0.00	0.00	0.60	0.52	0.52	0.28	0.77	0.78
Avail Cap(c_a), veh/h	337	0	343	243	0	0	78	977	1005	78	949	941
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.84	0.84	0.84
Uniform Delay (d), s/veh	44.9	0.0	38.1	41.0	0.0	0.0	54.8	0.0	0.0	58.1	17.1	17.3
Incr Delay (d2), s/veh	5.4	0.0	0.5	0.4	0.0	0.0	9.6	2.0	1.9	4.5	5.0	5.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.3	0.0	1.9	1.0	0.0	0.0	1.1	0.5	0.5	0.3	13.6	14.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.3	0.0	38.6	41.4	0.0	0.0	64.4	2.0	1.9	62.7	22.1	22.7
LnGrp LOS	D	A	D	D	A	A	E	A	A	E	C	C
Approach Vol, veh/h		278			39			1063			1471	
Approach Delay, s/veh		47.2			41.4			3.9			22.7	
Approach LOS		D			D			A			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.2	80.6		32.2	9.4	78.4		32.2				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	5.0	65.0		32.0	5.0	65.0		32.0				
Max Q Clear Time (g_c+I1), s	2.6	2.0		25.5	4.5	44.5		11.8				
Green Ext Time (p_c), s	0.0	6.9		0.8	0.0	9.5		0.1				
Intersection Summary												
HCM 6th Ctrl Delay			18.3									
HCM 6th LOS			B									
Notes												

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	11	1057	17	21	1250
Future Vol, veh/h	0	11	1057	17	21	1250
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	11	1057	17	21	1250

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	537	0	0	1074	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	4.14	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	0	488	-	-	645	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	488	-	-	645	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.5	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	488	645	-
HCM Lane V/C Ratio	-	-	0.023	0.033	-
HCM Control Delay (s)	-	-	12.5	10.8	-
HCM Lane LOS	-	-	B	B	-
HCM 95th %tile Q(veh)	-	-	0.1	0.1	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	158	99	78	100	290	91	131	709	37	55	941	158
Future Volume (veh/h)	158	99	78	100	290	91	131	709	37	55	941	158
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1604	1604	1604	1678	1678	1678	1693	1693	1693	1737	1737	1737
Adj Flow Rate, veh/h	158	99	78	100	290	91	131	709	37	55	941	158
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	20	20	20	15	15	15	14	14	14	11	11	11
Cap, veh/h	193	305	259	134	354	109	167	1585	83	82	1503	670
Arrive On Green	0.13	0.19	0.19	0.08	0.15	0.15	0.10	0.51	0.51	0.10	0.91	0.91
Sat Flow, veh/h	1527	1604	1359	1598	2400	738	1612	3109	162	1654	3300	1472
Grp Volume(v), veh/h	158	99	78	100	191	190	131	367	379	55	941	158
Grp Sat Flow(s),veh/h/ln	1527	1604	1359	1598	1594	1545	1612	1608	1663	1654	1650	1472
Q Serve(g_s), s	12.1	6.4	5.9	7.3	13.9	14.4	9.5	17.4	17.4	3.9	7.1	1.5
Cycle Q Clear(g_c), s	12.1	6.4	5.9	7.3	13.9	14.4	9.5	17.4	17.4	3.9	7.1	1.5
Prop In Lane	1.00		1.00	1.00		0.48	1.00		0.10	1.00		1.00
Lane Grp Cap(c), veh/h	193	305	259	134	235	228	167	820	848	82	1503	670
V/C Ratio(X)	0.82	0.32	0.30	0.75	0.81	0.83	0.78	0.45	0.45	0.67	0.63	0.24
Avail Cap(c_a), veh/h	255	334	283	186	252	245	215	820	848	138	1503	670
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.1	41.9	41.7	53.7	49.5	49.7	52.5	18.7	18.7	53.1	3.2	3.0
Incr Delay (d2), s/veh	14.4	0.6	0.6	9.9	16.8	20.4	13.3	1.8	1.7	9.2	2.0	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.3	2.5	2.0	3.2	6.5	6.7	4.3	6.3	6.5	1.7	1.6	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	65.5	42.5	42.4	63.6	66.3	70.1	65.7	20.4	20.4	62.3	5.2	3.8
LnGrp LOS	E	D	D	E	E	E	E	C	C	E	A	A
Approach Vol, veh/h		335			481			877			1154	
Approach Delay, s/veh		53.3			67.3			27.2			7.7	
Approach LOS		D			E			C			A	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.9	66.2	15.1	27.8	17.5	59.6	20.2	22.7
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	9.0	50.0	13.0	24.0	15.0	44.0	19.0	18.0
Max Q Clear Time (g_c+I1), s	5.9	19.4	9.3	8.4	11.5	9.1	14.1	16.4
Green Ext Time (p_c), s	0.0	4.2	0.1	0.6	0.1	7.3	0.2	0.3

Intersection Summary		
HCM 6th Ctrl Delay		29.2
HCM 6th LOS		C

Intersection						
Int Delay, s/veh	5.2					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	19	35	31	91	134	19
Future Vol, veh/h	19	35	31	91	134	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	50	50	50	50	50	50
Mvmt Flow	19	35	31	91	134	19

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	364	77	0	0	122	0
Stage 1	77	-	-	-	-	-
Stage 2	287	-	-	-	-	-
Critical Hdwy	6.9	6.7	-	-	4.6	-
Critical Hdwy Stg 1	5.9	-	-	-	-	-
Critical Hdwy Stg 2	5.9	-	-	-	-	-
Follow-up Hdwy	3.95	3.75	-	-	2.65	-
Pot Cap-1 Maneuver	550	866	-	-	1215	-
Stage 1	838	-	-	-	-	-
Stage 2	664	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	489	866	-	-	1215	-
Mov Cap-2 Maneuver	489	-	-	-	-	-
Stage 1	838	-	-	-	-	-
Stage 2	590	-	-	-	-	-

Approach	WB		NB		SB	
HCM Control Delay, s	10.7		0		7.3	
HCM LOS	B					

Minor Lane/Major Mvmt		NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)		-	-	681	1215	-
HCM Lane V/C Ratio		-	-	0.079	0.11	-
HCM Control Delay (s)		-	-	10.7	8.3	0
HCM Lane LOS		-	-	B	A	A
HCM 95th %tile Q(veh)		-	-	0.3	0.4	-

Intersection	
Int Delay, s/veh	4.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	181	73	74	215	134	74
Future Vol, veh/h	181	73	74	215	134	74
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	200	-	200	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	181	73	74	215	134	74

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	254	0	581	218
Stage 1	-	-	-	-	218	-
Stage 2	-	-	-	-	363	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1311	-	476	822
Stage 1	-	-	-	-	818	-
Stage 2	-	-	-	-	704	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1311	-	449	822
Mov Cap-2 Maneuver	-	-	-	-	534	-
Stage 1	-	-	-	-	818	-
Stage 2	-	-	-	-	665	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2	12.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	534	822	-	-	1311	-
HCM Lane V/C Ratio	0.251	0.09	-	-	0.056	-
HCM Control Delay (s)	14	9.8	-	-	7.9	-
HCM Lane LOS	B	A	-	-	A	-
HCM 95th %tile Q(veh)	1	0.3	-	-	0.2	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	98	263	495	194	306	131	590	1323	204	85	824	61
Future Volume (veh/h)	98	263	495	194	306	131	590	1323	204	85	824	61
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	98	263	495	194	306	131	590	1323	204	85	824	61
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	144	758	654	246	962	429	689	1572	242	128	1089	80
Arrive On Green	0.08	0.21	0.21	0.14	0.27	0.27	0.20	0.35	0.35	0.07	0.22	0.22
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	3456	4463	688	1781	4852	358
Grp Volume(v), veh/h	98	263	495	194	306	131	590	1009	518	85	577	308
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1728	1702	1747	1781	1702	1806
Q Serve(g_s), s	4.8	5.6	19.0	9.4	6.1	5.9	14.7	24.3	24.3	4.1	14.1	14.2
Cycle Q Clear(g_c), s	4.8	5.6	19.0	9.4	6.1	5.9	14.7	24.3	24.3	4.1	14.1	14.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.39	1.00		0.20
Lane Grp Cap(c), veh/h	144	758	654	246	962	429	689	1199	615	128	764	405
V/C Ratio(X)	0.68	0.35	0.76	0.79	0.32	0.31	0.86	0.84	0.84	0.66	0.76	0.76
Avail Cap(c_a), veh/h	200	758	654	260	962	429	698	1199	615	140	764	405
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.8	29.8	22.3	37.1	25.9	25.8	34.4	26.6	26.6	40.3	32.3	32.3
Incr Delay (d2), s/veh	5.5	0.3	5.1	14.2	0.2	0.4	10.1	7.2	13.1	10.1	6.8	12.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	2.3	9.0	4.9	2.5	2.1	6.8	10.3	11.6	2.1	6.2	7.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.4	30.1	27.4	51.3	26.1	26.2	44.6	33.8	39.7	50.4	39.1	44.9
LnGrp LOS	D	C	C	D	C	C	D	C	D	D	D	D
Approach Vol, veh/h		856			631			2117			970	
Approach Delay, s/veh		30.3			33.9			38.3			41.9	
Approach LOS		C			C			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.4	36.4	17.3	24.0	22.8	25.0	12.2	29.1				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	6.0	30.0	12.0	18.0	17.0	19.0	9.0	21.0				
Max Q Clear Time (g_c+I1), s	6.1	26.3	11.4	21.0	16.7	16.2	6.8	8.1				
Green Ext Time (p_c), s	0.0	2.8	0.0	0.0	0.1	1.4	0.0	1.8				

Intersection Summary			
HCM 6th Ctrl Delay			36.9
HCM 6th LOS			D

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	666	3	521	362	1656	0	0	1202	418
Future Volume (veh/h)	0	0	0	666	3	521	362	1656	0	0	1202	418
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1752	1752	1752	1841	1841	0	0	1856	1856
Adj Flow Rate, veh/h				829	0	348	362	1656	0	0	1202	418
Peak Hour Factor				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %				10	10	10	4	4	0	0	3	3
Cap, veh/h				1068	0	475	498	2772	0	0	2177	536
Arrive On Green				0.32	0.00	0.32	0.15	0.55	0.00	0.00	0.34	0.34
Sat Flow, veh/h				3337	0	1485	3401	5191	0	0	6643	1572
Grp Volume(v), veh/h				829	0	348	362	1656	0	0	1202	418
Grp Sat Flow(s),veh/h/ln				1668	0	1485	1700	1675	0	0	1596	1572
Q Serve(g_s), s				17.5	0.0	16.2	7.9	17.2	0.0	0.0	11.9	18.6
Cycle Q Clear(g_c), s				17.5	0.0	16.2	7.9	17.2	0.0	0.0	11.9	18.6
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				1068	0	475	498	2772	0	0	2177	536
V/C Ratio(X)				0.78	0.00	0.73	0.73	0.60	0.00	0.00	0.55	0.78
Avail Cap(c_a), veh/h				1584	0	705	654	2772	0	0	2177	536
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				24.0	0.0	23.5	31.8	11.7	0.0	0.0	20.9	23.1
Incr Delay (d2), s/veh				1.5	0.0	2.2	2.8	1.0	0.0	0.0	1.0	10.7
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				6.7	0.0	5.7	3.1	4.9	0.0	0.0	3.9	7.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				25.4	0.0	25.7	34.6	12.7	0.0	0.0	21.9	33.8
LnGrp LOS				C	A	C	C	B	A	A	C	C
Approach Vol, veh/h					1177			2018			1620	
Approach Delay, s/veh					25.5			16.6			24.9	
Approach LOS					C			B			C	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		48.0			16.4	31.6		30.0				
Change Period (Y+Rc), s		6.0			6.0	6.0		6.0				
Max Green Setting (Gmax), s		42.0			14.0	22.0		36.0				
Max Q Clear Time (g_c+I1), s		19.2			9.9	20.6		19.5				
Green Ext Time (p_c), s		11.7			0.5	1.1		4.4				
Intersection Summary												
HCM 6th Ctrl Delay			21.6									
HCM 6th LOS			C									

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	618	0	479	0	0	0	0	1423	681	481	1413	0
Future Volume (veh/h)	618	0	479	0	0	0	0	1423	681	481	1413	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1767	1767	1767				0	1781	1781	1796	1796	0
Adj Flow Rate, veh/h	767	0	319				0	1423	681	481	1413	0
Peak Hour Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	9	9	9				0	8	8	7	7	0
Cap, veh/h	785	0	349				0	1442	670	516	2237	0
Arrive On Green	0.23	0.00	0.23				0.00	0.44	0.44	0.16	0.66	0.00
Sat Flow, veh/h	3365	0	1497				0	3406	1507	3319	3503	0
Grp Volume(v), veh/h	767	0	319				0	1422	682	481	1413	0
Grp Sat Flow(s),veh/h/ln	1682	0	1497				0	1621	1510	1659	1706	0
Q Serve(g_s), s	20.4	0.0	18.7				0.0	39.0	40.0	12.9	21.9	0.0
Cycle Q Clear(g_c), s	20.4	0.0	18.7				0.0	39.0	40.0	12.9	21.9	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	785	0	349				0	1441	671	516	2237	0
V/C Ratio(X)	0.98	0.00	0.91				0.00	0.99	1.02	0.93	0.63	0.00
Avail Cap(c_a), veh/h	785	0	349				0	1441	671	516	2237	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	34.3	0.0	33.6				0.0	24.7	25.0	37.5	9.1	0.0
Incr Delay (d2), s/veh	26.4	0.0	27.5				0.0	20.7	39.0	23.9	1.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.0	0.0	9.3				0.0	16.6	19.2	6.5	6.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.6	0.0	61.1				0.0	45.4	64.0	61.4	10.5	0.0
LnGrp LOS	E	A	E				A	D	F	E	B	A
Approach Vol, veh/h		1086						2104			1894	
Approach Delay, s/veh		60.8						51.5			23.4	
Approach LOS		E						D			C	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	19.0	45.0		26.0		64.0						
Change Period (Y+Rc), s	6.0	6.0		6.0		6.0						
Max Green Setting (Gmax), s	13.0	39.0		20.0		57.0						
Max Q Clear Time (g_c+I1), s	14.9	42.0		22.4		23.9						
Green Ext Time (p_c), s	0.0	0.0		0.0		11.7						
Intersection Summary												
HCM 6th Ctrl Delay			43.0									
HCM 6th LOS			D									
Notes												

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	431	124	157	36	31	76	41	1534	28	28	1561	298
Future Volume (veh/h)	431	124	157	36	31	76	41	1534	28	28	1561	298
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1411	1411	1411	1767	1767	1767	1707	1707	1707
Adj Flow Rate, veh/h	431	124	157	36	31	76	41	1534	28	28	1561	298
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	7	7	7	33	33	33	9	9	9	13	13	13
Cap, veh/h	387	530	449	283	395	353	80	1671	30	64	1332	248
Arrive On Green	0.29	0.29	0.29	0.29	0.29	0.29	0.05	0.50	0.50	0.04	0.49	0.49
Sat Flow, veh/h	1236	1796	1522	828	1340	1196	1682	3372	61	1626	2730	508
Grp Volume(v), veh/h	431	124	157	36	31	76	41	763	799	28	910	949
Grp Sat Flow(s),veh/h/ln	1236	1796	1522	828	1340	1196	1682	1678	1756	1626	1622	1616
Q Serve(g_s), s	21.8	4.6	7.1	3.0	1.5	4.2	2.1	37.0	37.2	1.5	43.0	43.0
Cycle Q Clear(g_c), s	26.0	4.6	7.1	7.6	1.5	4.2	2.1	37.0	37.2	1.5	43.0	43.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.04	1.00		0.31
Lane Grp Cap(c), veh/h	387	530	449	283	395	353	80	832	870	64	791	788
V/C Ratio(X)	1.11	0.23	0.35	0.13	0.08	0.22	0.52	0.92	0.92	0.44	1.15	1.20
Avail Cap(c_a), veh/h	387	530	449	283	395	353	114	832	870	111	791	788
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.5	23.5	24.4	26.4	22.4	23.4	41.0	20.6	20.6	41.4	22.6	22.6
Incr Delay (d2), s/veh	80.3	0.2	0.5	0.2	0.1	0.3	5.1	14.9	14.6	4.6	82.1	103.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	16.7	1.9	2.5	0.6	0.4	1.1	0.9	15.1	15.8	0.6	31.2	35.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	115.8	23.8	24.9	26.6	22.5	23.7	46.1	35.4	35.2	46.0	104.7	126.3
LnGrp LOS	F	C	C	C	C	C	D	D	D	D	F	F
Approach Vol, veh/h		712			143			1603			1887	
Approach Delay, s/veh		79.7			24.2			35.6			114.7	
Approach LOS		E			C			D			F	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.5	48.7		31.0	9.2	48.0		31.0
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0
Max Green Setting (Gmax), s	5.0	42.0		25.0	5.0	42.0		25.0
Max Q Clear Time (g_c+I1), s	3.5	39.2		28.0	4.1	45.0		9.6
Green Ext Time (p_c), s	0.0	2.1		0.0	0.0	0.0		0.6

Intersection Summary			
HCM 6th Ctrl Delay			76.8
HCM 6th LOS			E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	111	16	99	40	20	68	91	1397	20	57	1609	81
Future Volume (veh/h)	111	16	99	40	20	68	91	1397	20	57	1609	81
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1707	1707	1707	1633	1633	1633	1752	1752	1752	1707	1707	1707
Adj Flow Rate, veh/h	111	16	99	40	20	68	91	1397	20	57	1609	81
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	13	13	13	18	18	18	10	10	10	13	13	13
Cap, veh/h	182	30	117	265	325	275	116	1925	28	89	1755	88
Arrive On Green	0.20	0.20	0.20	0.20	0.20	0.20	0.07	0.57	0.57	0.05	0.56	0.56
Sat Flow, veh/h	602	153	589	1115	1633	1384	1668	3359	48	1626	3143	158
Grp Volume(v), veh/h	226	0	0	40	20	68	91	692	725	57	827	863
Grp Sat Flow(s),veh/h/ln	1343	0	0	1115	1633	1384	1668	1664	1743	1626	1622	1679
Q Serve(g_s), s	12.7	0.0	0.0	0.0	0.9	3.6	4.6	26.3	26.3	3.0	39.7	40.4
Cycle Q Clear(g_c), s	14.0	0.0	0.0	3.4	0.9	3.6	4.6	26.3	26.3	3.0	39.7	40.4
Prop In Lane	0.49		0.44	1.00		1.00	1.00		0.03	1.00		0.09
Lane Grp Cap(c), veh/h	329	0	0	265	325	275	116	954	999	89	906	938
V/C Ratio(X)	0.69	0.00	0.00	0.15	0.06	0.25	0.79	0.73	0.73	0.64	0.91	0.92
Avail Cap(c_a), veh/h	357	0	0	288	359	304	116	962	1008	113	938	971
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.2	0.0	0.0	29.1	28.1	29.2	39.6	13.5	13.5	40.0	17.2	17.4
Incr Delay (d2), s/veh	4.9	0.0	0.0	0.3	0.1	0.5	29.1	2.7	2.6	7.7	12.8	13.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.8	0.0	0.0	0.7	0.3	1.2	2.7	8.1	8.5	1.3	14.3	15.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.2	0.0	0.0	29.4	28.2	29.7	68.7	16.2	16.1	47.8	30.0	30.8
LnGrp LOS	D	A	A	C	C	C	E	B	B	D	C	C
Approach Vol, veh/h		226			128			1508			1747	
Approach Delay, s/veh		38.2			29.3			19.3			30.9	
Approach LOS		D			C			B			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.7	54.6		22.2	11.0	53.3		22.2				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	5.0	49.0		18.0	5.0	49.0		18.0				
Max Q Clear Time (g_c+I1), s	5.0	28.3		16.0	6.6	42.4		5.6				
Green Ext Time (p_c), s	0.0	8.8		0.2	0.0	4.9		0.3				

Intersection Summary			
HCM 6th Ctrl Delay			26.5
HCM 6th LOS			C

Intersection	
Int Delay, s/veh	1.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	3	134	1297	9	80	1695
Future Vol, veh/h	3	134	1297	9	80	1695
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	200	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	32	32	9	9	12	12
Mvmt Flow	3	134	1297	9	80	1695

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2310	653	0	0	1306	0
Stage 1	1302	-	-	-	-	-
Stage 2	1008	-	-	-	-	-
Critical Hdwy	7.44	7.54	-	-	4.34	-
Critical Hdwy Stg 1	6.44	-	-	-	-	-
Critical Hdwy Stg 2	6.44	-	-	-	-	-
Follow-up Hdwy	3.82	3.62	-	-	2.32	-
Pot Cap-1 Maneuver	21	345	-	-	475	-
Stage 1	169	-	-	-	-	-
Stage 2	253	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	17	345	-	-	475	-
Mov Cap-2 Maneuver	93	-	-	-	-	-
Stage 1	169	-	-	-	-	-
Stage 2	210	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	23.8	0	0.6
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	326	475	-
HCM Lane V/C Ratio	-	-	0.42	0.168	-
HCM Control Delay (s)	-	-	23.8	14.1	-
HCM Lane LOS	-	-	C	B	-
HCM 95th %tile Q(veh)	-	-	2	0.6	-

Movement	EBL	EBR	NBU	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (veh/h)	31	161	2	102	1259	1637	55
Future Volume (veh/h)	31	161	2	102	1259	1637	55
Initial Q (Qb), veh	0	0		0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00			1.00
Parking Bus, Adj	1.00	1.00		1.00	1.00	1.00	1.00
Work Zone On Approach	No				No	No	
Adj Sat Flow, veh/h/ln	1870	1870		1870	1870	1870	1870
Adj Flow Rate, veh/h	31	161		102	1259	1637	55
Peak Hour Factor	1.00	1.00		1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2		2	2	2	2
Cap, veh/h	243	217		151	2636	2156	72
Arrive On Green	0.14	0.14		0.08	0.74	0.61	0.61
Sat Flow, veh/h	1781	1585		1781	3647	3602	118
Grp Volume(v), veh/h	31	161		102	1259	826	866
Grp Sat Flow(s),veh/h/ln	1781	1585		1781	1777	1777	1849
Q Serve(g_s), s	1.3	8.0		4.6	11.7	27.6	27.9
Cycle Q Clear(g_c), s	1.3	8.0		4.6	11.7	27.6	27.9
Prop In Lane	1.00	1.00		1.00			0.06
Lane Grp Cap(c), veh/h	243	217		151	2636	1092	1136
V/C Ratio(X)	0.13	0.74		0.68	0.48	0.76	0.76
Avail Cap(c_a), veh/h	412	366		193	2636	1092	1136
HCM Platoon Ratio	1.00	1.00		1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00		1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.2	34.1		36.6	4.2	11.4	11.5
Incr Delay (d2), s/veh	0.2	5.0		6.3	0.6	4.9	4.8
Initial Q Delay(d3),s/veh	0.0	0.0		0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.3		2.2	3.2	10.6	11.1
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	31.4	39.1		42.8	4.9	16.3	16.3
LnGrp LOS	C	D		D	A	B	B
Approach Vol, veh/h	192				1361	1692	
Approach Delay, s/veh	37.9				7.7	16.3	
Approach LOS	D				A	B	

Timer - Assigned Phs		2		4	5	6	
Phs Duration (G+Y+Rc), s		66.0		16.2	10.5	55.5	
Change Period (Y+Rc), s		6.0		6.0	4.5	6.0	
Max Green Setting (Gmax), s		60.0		18.0	7.9	47.6	
Max Q Clear Time (g_c+I1), s		13.7		10.0	6.6	29.9	
Green Ext Time (p_c), s		13.2		0.3	0.0	11.8	

Intersection Summary			
HCM 6th Ctrl Delay			14.0
HCM 6th LOS			B

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	253	48	74	51	6	6	28	1080	44	22	1222	249
Future Volume (veh/h)	253	48	74	51	6	6	28	1080	44	22	1222	249
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1648	1648	1648	1826	1826	1826	1737	1737	1737	1678	1678	1678
Adj Flow Rate, veh/h	253	48	74	51	6	6	28	1080	44	22	1222	249
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	17	17	17	5	5	5	11	11	11	15	15	15
Cap, veh/h	346	130	201	216	25	20	56	2012	82	48	1635	330
Arrive On Green	0.22	0.22	0.22	0.22	0.22	0.22	0.07	1.00	1.00	0.03	0.62	0.62
Sat Flow, veh/h	1236	585	901	726	114	88	1654	3232	132	1598	2642	533
Grp Volume(v), veh/h	253	0	122	63	0	0	28	551	573	22	733	738
Grp Sat Flow(s),veh/h/ln	1236	0	1486	928	0	0	1654	1650	1713	1598	1594	1582
Q Serve(g_s), s	9.9	0.0	8.3	4.5	0.0	0.0	2.0	0.0	0.0	1.6	38.9	40.0
Cycle Q Clear(g_c), s	22.7	0.0	8.3	12.8	0.0	0.0	2.0	0.0	0.0	1.6	38.9	40.0
Prop In Lane	1.00		0.61	0.81		0.10	1.00		0.08	1.00		0.34
Lane Grp Cap(c), veh/h	346	0	331	261	0	0	56	1027	1066	48	986	979
V/C Ratio(X)	0.73	0.00	0.37	0.24	0.00	0.00	0.50	0.54	0.54	0.46	0.74	0.75
Avail Cap(c_a), veh/h	411	0	409	329	0	0	83	1027	1066	80	986	979
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.61	0.61	0.61
Uniform Delay (d), s/veh	44.9	0.0	39.5	43.8	0.0	0.0	55.0	0.0	0.0	57.2	16.1	16.4
Incr Delay (d2), s/veh	5.4	0.0	0.7	0.5	0.0	0.0	6.9	2.0	1.9	4.1	3.1	3.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.8	0.0	3.2	1.7	0.0	0.0	0.9	0.6	0.6	0.7	12.7	12.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.3	0.0	40.2	44.3	0.0	0.0	61.9	2.0	1.9	61.4	19.3	19.7
LnGrp LOS	D	A	D	D	A	A	E	A	A	E	B	B
Approach Vol, veh/h		375			63			1152			1493	
Approach Delay, s/veh		47.0			44.3			3.4			20.1	
Approach LOS		D			D			A			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.6	79.7		31.7	9.0	79.3		31.7				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	5.0	65.0		32.0	5.0	65.0		32.0				
Max Q Clear Time (g_c+I1), s	3.6	2.0		24.7	4.0	42.0		14.8				
Green Ext Time (p_c), s	0.0	7.8		1.0	0.0	10.0		0.2				

Intersection Summary			
HCM 6th Ctrl Delay			17.6
HCM 6th LOS			B

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	35	1132	7	9	1337
Future Vol, veh/h	0	35	1132	7	9	1337
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	35	1132	7	9	1337

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	570	0	0	1139	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	4.14	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	0	465	-	-	609	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	465	-	-	609	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.4	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	465	609	-
HCM Lane V/C Ratio	-	-	0.075	0.015	-
HCM Control Delay (s)	-	-	13.4	11	-
HCM Lane LOS	-	-	B	B	-
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	170	423	184	76	175	115	132	764	82	113	1039	156
Future Volume (veh/h)	170	423	184	76	175	115	132	764	82	113	1039	156
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1767	1767	1767	1604	1604	1604	1767	1767	1767	1781	1781	1781
Adj Flow Rate, veh/h	170	423	184	76	175	115	132	764	82	113	1039	156
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	9	9	9	20	20	20	9	9	9	8	8	8
Cap, veh/h	210	468	396	105	376	234	169	1264	136	147	1352	603
Arrive On Green	0.12	0.26	0.26	0.07	0.21	0.21	0.10	0.41	0.41	0.17	0.80	0.80
Sat Flow, veh/h	1682	1767	1497	1527	1803	1122	1682	3058	328	1697	3385	1510
Grp Volume(v), veh/h	170	423	184	76	146	144	132	419	427	113	1039	156
Grp Sat Flow(s),veh/h/ln	1682	1767	1497	1527	1523	1402	1682	1678	1708	1697	1692	1510
Q Serve(g_s), s	11.8	27.8	12.4	5.9	10.1	10.8	9.2	23.4	23.5	7.6	19.2	3.1
Cycle Q Clear(g_c), s	11.8	27.8	12.4	5.9	10.1	10.8	9.2	23.4	23.5	7.6	19.2	3.1
Prop In Lane	1.00		1.00	1.00		0.80	1.00		0.19	1.00		1.00
Lane Grp Cap(c), veh/h	210	468	396	105	318	292	169	694	706	147	1352	603
V/C Ratio(X)	0.81	0.90	0.46	0.73	0.46	0.49	0.78	0.60	0.60	0.77	0.77	0.26
Avail Cap(c_a), veh/h	294	501	424	115	318	292	182	694	706	156	1352	603
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.1	42.7	37.0	54.8	41.6	41.9	52.7	27.5	27.5	48.4	9.2	7.6
Incr Delay (d2), s/veh	10.9	19.1	0.8	18.6	1.0	1.3	18.1	3.9	3.8	19.5	4.2	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5	14.1	4.5	2.7	3.8	3.7	4.6	9.4	9.6	3.7	3.9	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	62.1	61.8	37.8	73.4	42.6	43.2	70.7	31.4	31.3	67.9	13.4	8.6
LnGrp LOS	E	E	D	E	D	D	E	C	C	E	B	A
Approach Vol, veh/h		777			366			978			1308	
Approach Delay, s/veh		56.2			49.2			36.7			17.6	
Approach LOS		E			D			D			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.4	54.6	13.2	36.8	17.1	52.9	20.0	30.0
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	10.0	45.0	8.0	33.0	12.0	43.0	20.0	21.0
Max Q Clear Time (g_c+I1), s	9.6	25.5	7.9	29.8	11.2	21.2	13.8	12.8
Green Ext Time (p_c), s	0.0	4.5	0.0	1.0	0.0	7.3	0.2	0.9

Intersection Summary			
HCM 6th Ctrl Delay			35.1
HCM 6th LOS			D

Intersection	
Int Delay, s/veh	6.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	54	103	73	41	59	12
Future Vol, veh/h	54	103	73	41	59	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	50	50	50	50	50	50
Mvmt Flow	54	103	73	41	59	12

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	224	94	0	0	114	0
Stage 1	94	-	-	-	-	-
Stage 2	130	-	-	-	-	-
Critical Hdwy	6.9	6.7	-	-	4.6	-
Critical Hdwy Stg 1	5.9	-	-	-	-	-
Critical Hdwy Stg 2	5.9	-	-	-	-	-
Follow-up Hdwy	3.95	3.75	-	-	2.65	-
Pot Cap-1 Maneuver	669	846	-	-	1224	-
Stage 1	822	-	-	-	-	-
Stage 2	790	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	636	846	-	-	1224	-
Mov Cap-2 Maneuver	636	-	-	-	-	-
Stage 1	822	-	-	-	-	-
Stage 2	751	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11	0	6.7
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	760	1224	-
HCM Lane V/C Ratio	-	-	0.207	0.048	-
HCM Control Delay (s)	-	-	11	8.1	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.8	0.2	-

Intersection	
Int Delay, s/veh	3.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	275	146	75	208	81	94
Future Vol, veh/h	275	146	75	208	81	94
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	200	-	200	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	275	146	75	208	81	94

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	421	0	706	348
Stage 1	-	-	-	-	348	-
Stage 2	-	-	-	-	358	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1138	-	402	695
Stage 1	-	-	-	-	715	-
Stage 2	-	-	-	-	707	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1138	-	375	695
Mov Cap-2 Maneuver	-	-	-	-	484	-
Stage 1	-	-	-	-	715	-
Stage 2	-	-	-	-	660	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.2	12.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	484	695	-	-	1138	-
HCM Lane V/C Ratio	0.167	0.135	-	-	0.066	-
HCM Control Delay (s)	13.9	11	-	-	8.4	-
HCM Lane LOS	B	B	-	-	A	-
HCM 95th %tile Q(veh)	0.6	0.5	-	-	0.2	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	192	601	214	177	38	405	754	197	65	1255	30
Future Volume (veh/h)	38	192	601	214	177	38	405	754	197	65	1255	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	38	192	601	214	177	38	405	754	197	65	1255	30
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	80	750	564	218	1024	457	499	1563	404	103	1539	37
Arrive On Green	0.05	0.21	0.21	0.12	0.29	0.29	0.14	0.39	0.39	0.06	0.30	0.30
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	3456	4041	1045	1781	5130	123
Grp Volume(v), veh/h	38	192	601	214	177	38	405	634	317	65	833	452
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1728	1702	1682	1781	1702	1848
Q Serve(g_s), s	1.9	4.1	19.0	10.8	3.4	1.6	10.2	12.6	12.8	3.2	20.4	20.4
Cycle Q Clear(g_c), s	1.9	4.1	19.0	10.8	3.4	1.6	10.2	12.6	12.8	3.2	20.4	20.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.62	1.00		0.07
Lane Grp Cap(c), veh/h	80	750	564	218	1024	457	499	1316	650	103	1021	554
V/C Ratio(X)	0.47	0.26	1.07	0.98	0.17	0.08	0.81	0.48	0.49	0.63	0.82	0.82
Avail Cap(c_a), veh/h	119	750	564	218	1024	457	499	1316	650	158	1021	554
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.9	29.6	29.0	39.4	24.0	23.4	37.3	20.8	20.9	41.5	29.2	29.2
Incr Delay (d2), s/veh	4.2	0.2	56.8	55.9	0.1	0.1	9.8	1.3	2.6	6.2	7.2	12.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	1.7	20.5	8.0	1.4	0.6	4.9	5.1	5.3	1.6	9.1	10.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.2	29.8	85.8	95.4	24.1	23.4	47.1	22.1	23.5	47.7	36.4	41.7
LnGrp LOS	D	C	F	F	C	C	D	C	C	D	D	D
Approach Vol, veh/h		831			429			1356			1350	
Approach Delay, s/veh		71.1			59.6			29.9			38.7	
Approach LOS		E			E			C			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.2	39.8	16.0	24.0	18.0	32.0	9.1	30.9				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	7.0	31.0	10.0	18.0	12.0	26.0	5.0	23.0				
Max Q Clear Time (g_c+I1), s	5.2	14.8	12.8	21.0	12.2	22.4	3.9	5.4				
Green Ext Time (p_c), s	0.0	5.9	0.0	0.0	0.0	2.5	0.0	1.1				
Intersection Summary												
HCM 6th Ctrl Delay			44.7									
HCM 6th LOS			D									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	790	5	419	585	1111	0	0	1226	588
Future Volume (veh/h)	0	0	0	790	5	419	585	1111	0	0	1226	588
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1737	1737	1737	1678	1678	0	0	1870	1870
Adj Flow Rate, veh/h				922	0	281	585	1111	0	0	1226	588
Peak Hour Factor				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %				11	11	11	15	15	0	0	2	2
Cap, veh/h				1055	0	469	685	2600	0	0	1865	460
Arrive On Green				0.32	0.00	0.32	0.22	0.57	0.00	0.00	0.29	0.29
Sat Flow, veh/h				3309	0	1472	3100	4731	0	0	6696	1585
Grp Volume(v), veh/h				922	0	281	585	1111	0	0	1226	588
Grp Sat Flow(s),veh/h/ln				1654	0	1472	1550	1527	0	0	1609	1585
Q Serve(g_s), s				23.2	0.0	14.2	16.0	12.2	0.0	0.0	14.7	25.5
Cycle Q Clear(g_c), s				23.2	0.0	14.2	16.0	12.2	0.0	0.0	14.7	25.5
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				1055	0	469	685	2600	0	0	1865	460
V/C Ratio(X)				0.87	0.00	0.60	0.85	0.43	0.00	0.00	0.66	1.28
Avail Cap(c_a), veh/h				1127	0	501	739	2600	0	0	1865	460
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				28.3	0.0	25.3	32.9	10.9	0.0	0.0	27.4	31.3
Incr Delay (d2), s/veh				7.5	0.0	1.8	9.1	0.5	0.0	0.0	1.8	141.7
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				9.9	0.0	5.0	6.3	3.3	0.0	0.0	5.3	26.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				35.8	0.0	27.0	42.0	11.4	0.0	0.0	29.3	173.0
LnGrp LOS				D	A	C	D	B	A	A	C	F
Approach Vol, veh/h					1203			1696			1814	
Approach Delay, s/veh					33.8			21.9			75.9	
Approach LOS					C			C			E	

Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		55.0			24.5	30.5		33.1				
Change Period (Y+Rc), s		6.0			6.0	6.0		6.0				
Max Green Setting (Gmax), s		49.0			20.0	23.0		29.0				
Max Q Clear Time (g_c+I1), s		14.2			18.0	27.5		25.2				
Green Ext Time (p_c), s		8.2			0.5	0.0		1.9				

Intersection Summary			
HCM 6th Ctrl Delay			45.7
HCM 6th LOS			D

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	379	8	715	0	0	0	0	1314	673	426	1593	0
Future Volume (veh/h)	379	8	715	0	0	0	0	1314	673	426	1593	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1693	1693	1693				0	1574	1574	1796	1796	0
Adj Flow Rate, veh/h	255	0	853				0	1314	673	426	1593	0
Peak Hour Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	14	14	14				0	22	22	7	7	0
Cap, veh/h	430	0	765				0	1241	578	443	2124	0
Arrive On Green	0.27	0.00	0.27				0.00	0.43	0.43	0.13	0.62	0.00
Sat Flow, veh/h	1612	0	2869				0	3006	1334	3319	3503	0
Grp Volume(v), veh/h	255	0	853				0	1314	673	426	1593	0
Grp Sat Flow(s),veh/h/ln	1612	0	1434				0	1432	1334	1659	1706	0
Q Serve(g_s), s	12.4	0.0	24.0				0.0	39.0	39.0	11.5	29.8	0.0
Cycle Q Clear(g_c), s	12.4	0.0	24.0				0.0	39.0	39.0	11.5	29.8	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	430	0	765				0	1241	578	443	2124	0
V/C Ratio(X)	0.59	0.00	1.12				0.00	1.06	1.16	0.96	0.75	0.00
Avail Cap(c_a), veh/h	430	0	765				0	1241	578	443	2124	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	28.7	0.0	33.0				0.0	25.5	25.5	38.8	12.0	0.0
Incr Delay (d2), s/veh	2.2	0.0	68.9				0.0	42.6	91.7	33.2	2.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.9	0.0	15.4				0.0	18.4	25.1	6.3	8.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.9	0.0	101.9				0.0	68.1	117.2	72.0	14.5	0.0
LnGrp LOS	C	A	F				A	F	F	E	B	A
Approach Vol, veh/h		1108						1987			2019	
Approach Delay, s/veh		85.6						84.7			26.7	
Approach LOS		F						F			C	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	17.0	44.0		29.0		61.0
Change Period (Y+Rc), s	6.0	6.0		6.0		6.0
Max Green Setting (Gmax), s	11.0	38.0		23.0		55.0
Max Q Clear Time (g_c+I1), s	13.5	41.0		26.0		31.8
Green Ext Time (p_c), s	0.0	0.0		0.0		11.9

Intersection Summary	
HCM 6th Ctrl Delay	62.0
HCM 6th LOS	E

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	424	21	130	33	29	61	140	1433	30	44	1678	569
Future Volume (veh/h)	424	21	130	33	29	61	140	1433	30	44	1678	569
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1693	1693	1693	1455	1455	1455	1500	1500	1500	1722	1722	1722
Adj Flow Rate, veh/h	424	21	130	33	29	61	140	1433	30	44	1678	569
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	14	14	14	30	30	30	27	27	27	12	12	12
Cap, veh/h	350	451	382	328	369	329	111	1480	31	79	1191	382
Arrive On Green	0.27	0.27	0.27	0.27	0.27	0.27	0.08	0.52	0.52	0.05	0.49	0.49
Sat Flow, veh/h	1182	1693	1434	962	1383	1233	1428	2854	60	1640	2437	781
Grp Volume(v), veh/h	424	21	130	33	29	61	140	715	748	44	1095	1152
Grp Sat Flow(s),veh/h/ln	1182	1693	1434	962	1383	1233	1428	1425	1489	1640	1636	1582
Q Serve(g_s), s	20.6	0.8	6.6	2.4	1.4	3.4	7.0	43.6	43.8	2.4	44.0	44.0
Cycle Q Clear(g_c), s	24.0	0.8	6.6	3.2	1.4	3.4	7.0	43.6	43.8	2.4	44.0	44.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.04	1.00		0.49
Lane Grp Cap(c), veh/h	350	451	382	328	369	329	111	739	772	79	800	773
V/C Ratio(X)	1.21	0.05	0.34	0.10	0.08	0.19	1.26	0.97	0.97	0.56	1.37	1.49
Avail Cap(c_a), veh/h	350	451	382	328	369	329	111	739	772	109	800	773
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.1	24.5	26.6	25.7	24.7	25.5	41.5	20.9	21.0	41.9	23.0	23.0
Incr Delay (d2), s/veh	118.5	0.0	0.5	0.1	0.1	0.3	170.8	25.2	24.9	6.0	173.9	227.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	19.0	0.3	2.2	0.5	0.4	1.0	7.6	16.7	17.4	1.0	52.4	62.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	155.5	24.5	27.1	25.8	24.8	25.7	212.3	46.2	45.9	47.9	196.9	250.5
LnGrp LOS	F	C	C	C	C	C	F	D	D	D	F	F
Approach Vol, veh/h		575			123			1603			2291	
Approach Delay, s/veh		121.7			25.5			60.6			221.0	
Approach LOS		F			C			E			F	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.3	51.7		29.0	12.0	49.0		29.0
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0
Max Green Setting (Gmax), s	5.0	44.0		23.0	6.0	43.0		23.0
Max Q Clear Time (g_c+I1), s	4.4	45.8		26.0	9.0	46.0		5.4
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	0.0		0.5

Intersection Summary			
HCM 6th Ctrl Delay			147.3
HCM 6th LOS			F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	349	79	122	55	74	125	99	1170	61	240	1243	295
Future Volume (veh/h)	349	79	122	55	74	125	99	1170	61	240	1243	295
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1411	1411	1411	625	625	625	1574	1574	1574	1678	1678	1678
Adj Flow Rate, veh/h	349	79	122	55	74	125	99	1170	61	240	1243	295
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	33	33	33	86	86	86	22	22	22	15	15	15
Cap, veh/h	252	42	65	230	236	200	100	996	52	178	997	233
Arrive On Green	0.38	0.38	0.38	0.38	0.38	0.38	0.07	0.34	0.34	0.11	0.39	0.39
Sat Flow, veh/h	495	112	173	395	625	530	1499	2891	151	1598	2563	600
Grp Volume(v), veh/h	550	0	0	55	74	125	99	605	626	240	766	772
Grp Sat Flow(s),veh/h/ln	781	0	0	395	625	530	1499	1495	1547	1598	1594	1570
Q Serve(g_s), s	26.5	0.0	0.0	0.0	7.5	17.3	5.9	31.0	31.0	10.0	35.0	35.0
Cycle Q Clear(g_c), s	34.0	0.0	0.0	9.0	7.5	17.3	5.9	31.0	31.0	10.0	35.0	35.0
Prop In Lane	0.63		0.22	1.00		1.00	1.00		0.10	1.00		0.38
Lane Grp Cap(c), veh/h	360	0	0	230	236	200	100	515	533	178	620	610
V/C Ratio(X)	1.53	0.00	0.00	0.24	0.31	0.62	0.99	1.17	1.18	1.35	1.24	1.26
Avail Cap(c_a), veh/h	360	0	0	230	236	200	100	515	533	178	620	610
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.2	0.0	0.0	20.2	19.8	22.8	42.0	29.5	29.5	40.0	27.5	27.5
Incr Delay (d2), s/veh	250.7	0.0	0.0	0.5	0.7	5.9	86.9	97.3	97.3	190.7	119.9	131.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	32.9	0.0	0.0	0.8	1.1	2.3	4.5	23.6	24.5	13.0	32.1	33.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	284.9	0.0	0.0	20.8	20.5	28.7	128.8	126.8	126.8	230.7	147.4	159.0
LnGrp LOS	F	A	A	C	C	C	F	F	F	F	F	F
Approach Vol, veh/h		550			254			1330			1778	
Approach Delay, s/veh		284.9			24.6			127.0			163.7	
Approach LOS		F			C			F			F	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	15.0	36.0		39.0	11.0	40.0		39.0				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	9.0	30.0		33.0	5.0	34.0		33.0				
Max Q Clear Time (g_c+I1), s	12.0	33.0		36.0	7.9	37.0		19.3				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	0.0		1.4				
Intersection Summary												
HCM 6th Ctrl Delay			159.2									
HCM 6th LOS			F									

Intersection						
Int Delay, s/veh	0.7					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	52	1157	7	69	1273
Future Vol, veh/h	0	52	1157	7	69	1273
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	200	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	59	59	20	20	15	15
Mvmt Flow	0	52	1157	7	69	1273

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1936	582	0	0	1164	0
Stage 1	1161	-	-	-	-	-
Stage 2	775	-	-	-	-	-
Critical Hdwy	7.98	8.08	-	-	4.4	-
Critical Hdwy Stg 1	6.98	-	-	-	-	-
Critical Hdwy Stg 2	6.98	-	-	-	-	-
Follow-up Hdwy	4.09	3.89	-	-	2.35	-
Pot Cap-1 Maneuver	30	338	-	-	527	-
Stage 1	167	-	-	-	-	-
Stage 2	295	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	26	338	-	-	527	-
Mov Cap-2 Maneuver	104	-	-	-	-	-
Stage 1	167	-	-	-	-	-
Stage 2	256	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	17.6	0	0.7
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	338	527	-
HCM Lane V/C Ratio	-	-	0.154	0.131	-
HCM Control Delay (s)	-	-	17.6	12.9	-
HCM Lane LOS	-	-	C	B	-
HCM 95th %tile Q(veh)	-	-	0.5	0.4	-

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	59	141	80	1136	1258	79
Future Volume (veh/h)	59	141	80	1136	1258	79
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	59	141	80	1136	1258	79
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	376	335	178	2409	1773	111
Arrive On Green	0.21	0.21	0.10	0.68	0.52	0.52
Sat Flow, veh/h	1781	1585	1781	3647	3489	213
Grp Volume(v), veh/h	59	141	80	1136	657	680
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1777	1777	1832
Q Serve(g_s), s	2.4	6.9	3.8	13.6	25.2	25.4
Cycle Q Clear(g_c), s	2.4	6.9	3.8	13.6	25.2	25.4
Prop In Lane	1.00	1.00	1.00			0.12
Lane Grp Cap(c), veh/h	376	335	178	2409	928	957
V/C Ratio(X)	0.16	0.42	0.45	0.47	0.71	0.71
Avail Cap(c_a), veh/h	376	335	178	2409	928	957
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.0	30.7	38.2	6.9	16.3	16.3
Incr Delay (d2), s/veh	0.9	3.9	8.0	0.7	4.6	4.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	6.7	2.0	4.5	10.6	11.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	29.9	34.6	46.1	7.5	20.9	20.8
LnGrp LOS	C	C	D	A	C	C
Approach Vol, veh/h	200			1216	1337	
Approach Delay, s/veh	33.2			10.1	20.8	
Approach LOS	C			B	C	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		66.0		24.0	14.0	52.0
Change Period (Y+Rc), s		6.0		6.0	6.0	6.0
Max Green Setting (Gmax), s		60.0		18.0	8.0	46.0
Max Q Clear Time (g_c+I1), s		15.6		8.9	5.8	27.4
Green Ext Time (p_c), s		11.2		0.4	0.0	9.3

Intersection Summary			
HCM 6th Ctrl Delay			17.0
HCM 6th LOS			B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	204	40	29	15	3	5	34	1024	24	8	1270	250
Future Volume (veh/h)	204	40	29	15	3	5	34	1024	24	8	1270	250
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1337	1337	1337	1085	1085	1085	1633	1633	1633	1633	1633	1633
Adj Flow Rate, veh/h	204	40	29	15	3	5	34	1024	24	8	1270	250
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	38	38	38	55	55	55	18	18	18	18	18	18
Cap, veh/h	288	163	118	148	27	35	57	1954	46	28	1585	309
Arrive On Green	0.23	0.23	0.23	0.23	0.23	0.23	0.07	1.00	1.00	0.02	0.61	0.61
Sat Flow, veh/h	1006	720	522	434	119	154	1555	3099	73	1555	2590	504
Grp Volume(v), veh/h	204	0	69	23	0	0	34	513	535	8	756	764
Grp Sat Flow(s),veh/h/ln	1006	0	1243	706	0	0	1555	1552	1620	1555	1552	1542
Q Serve(g_s), s	16.7	0.0	5.5	1.4	0.0	0.0	2.5	0.0	0.0	0.6	44.2	45.8
Cycle Q Clear(g_c), s	23.6	0.0	5.5	6.9	0.0	0.0	2.5	0.0	0.0	0.6	44.2	45.8
Prop In Lane	1.00		0.42	0.65		0.22	1.00		0.04	1.00		0.33
Lane Grp Cap(c), veh/h	288	0	281	210	0	0	57	978	1022	28	950	944
V/C Ratio(X)	0.71	0.00	0.25	0.11	0.00	0.00	0.60	0.52	0.52	0.28	0.80	0.81
Avail Cap(c_a), veh/h	320	0	321	236	0	0	78	978	1022	78	950	944
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.66	0.66	0.66
Uniform Delay (d), s/veh	45.0	0.0	38.0	38.6	0.0	0.0	54.8	0.0	0.0	58.1	17.6	17.9
Incr Delay (d2), s/veh	6.3	0.0	0.4	0.2	0.0	0.0	9.6	2.0	1.9	3.6	4.6	5.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.4	0.0	1.7	0.6	0.0	0.0	1.1	0.5	0.5	0.3	14.4	14.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.3	0.0	38.5	38.8	0.0	0.0	64.4	2.0	1.9	61.7	22.2	23.0
LnGrp LOS	D	A	D	D	A	A	E	A	A	E	C	C
Approach Vol, veh/h		273			23			1082			1528	
Approach Delay, s/veh		48.1			38.8			3.9			22.8	
Approach LOS		D			D			A			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.2	80.7		32.2	9.4	78.4		32.2
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0
Max Green Setting (Gmax), s	5.0	67.0		30.0	5.0	67.0		30.0
Max Q Clear Time (g_c+I1), s	2.6	2.0		25.6	4.5	47.8		8.9
Green Ext Time (p_c), s	0.0	7.1		0.6	0.0	9.6		0.1

Intersection Summary		
HCM 6th Ctrl Delay		18.3
HCM 6th LOS		B

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	11	1076	17	21	1293
Future Vol, veh/h	0	11	1076	17	21	1293
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	11	1076	17	21	1293

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	547	0	0	1093	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	4.14	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	0	481	-	-	634	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	481	-	-	634	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB		NB		SB	
HCM Control Delay, s	12.7		0		0.2	
HCM LOS	B					

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	481	634	-
HCM Lane V/C Ratio	-	-	0.023	0.033	-
HCM Control Delay (s)	-	-	12.7	10.9	-
HCM Lane LOS	-	-	B	B	-
HCM 95th %tile Q(veh)	-	-	0.1	0.1	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	145	99	78	100	290	83	131	749	37	53	990	154
Future Volume (veh/h)	145	99	78	100	290	83	131	749	37	53	990	154
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1604	1604	1604	1678	1678	1678	1693	1693	1693	1737	1737	1737
Adj Flow Rate, veh/h	145	99	78	100	290	83	131	749	37	53	990	154
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	20	20	20	15	15	15	14	14	14	11	11	11
Cap, veh/h	180	287	243	134	357	100	167	1629	80	79	1540	687
Arrive On Green	0.12	0.18	0.18	0.08	0.15	0.15	0.10	0.52	0.52	0.10	0.93	0.93
Sat Flow, veh/h	1527	1604	1359	1598	2457	690	1612	3119	154	1654	3300	1472
Grp Volume(v), veh/h	145	99	78	100	186	187	131	386	400	53	990	154
Grp Sat Flow(s),veh/h/ln	1527	1604	1359	1598	1594	1553	1612	1608	1665	1654	1650	1472
Q Serve(g_s), s	11.1	6.5	6.0	7.3	13.6	14.0	9.5	18.1	18.1	3.7	6.0	1.1
Cycle Q Clear(g_c), s	11.1	6.5	6.0	7.3	13.6	14.0	9.5	18.1	18.1	3.7	6.0	1.1
Prop In Lane	1.00		1.00	1.00		0.44	1.00		0.09	1.00		1.00
Lane Grp Cap(c), veh/h	180	287	243	134	231	225	167	840	870	79	1540	687
V/C Ratio(X)	0.81	0.34	0.32	0.75	0.81	0.83	0.78	0.46	0.46	0.67	0.64	0.22
Avail Cap(c_a), veh/h	242	321	272	186	252	246	215	840	870	124	1540	687
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.6	43.1	42.9	53.7	49.6	49.8	52.5	18.0	18.0	53.3	2.3	2.2
Incr Delay (d2), s/veh	13.4	0.7	0.8	9.9	16.0	19.2	13.3	1.8	1.7	9.3	2.1	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.8	2.6	2.0	3.2	6.3	6.5	4.3	6.5	6.7	1.6	1.3	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	65.0	43.8	43.6	63.6	65.7	69.1	65.7	19.8	19.8	62.7	4.4	2.9
LnGrp LOS	E	D	D	E	E	E	E	B	B	E	A	A
Approach Vol, veh/h		322			473			917			1197	
Approach Delay, s/veh		53.3			66.6			26.3			6.8	
Approach LOS		D			E			C			A	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.7	67.7	15.1	26.5	17.5	61.0	19.1	22.4
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	8.0	52.0	13.0	23.0	15.0	45.0	18.0	18.0
Max Q Clear Time (g_c+I1), s	5.7	20.1	9.3	8.5	11.5	8.0	13.1	16.0
Green Ext Time (p_c), s	0.0	4.5	0.1	0.6	0.1	7.9	0.1	0.4

Intersection Summary	
HCM 6th Ctrl Delay	27.8
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	2.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	4	5	31	40	34	19
Future Vol, veh/h	4	5	31	40	34	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	50	50	50	50	50	50
Mvmt Flow	4	5	31	40	34	19

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	138	51	0	0	71	0
Stage 1	51	-	-	-	-	-
Stage 2	87	-	-	-	-	-
Critical Hdwy	6.9	6.7	-	-	4.6	-
Critical Hdwy Stg 1	5.9	-	-	-	-	-
Critical Hdwy Stg 2	5.9	-	-	-	-	-
Follow-up Hdwy	3.95	3.75	-	-	2.65	-
Pot Cap-1 Maneuver	754	896	-	-	1273	-
Stage 1	862	-	-	-	-	-
Stage 2	829	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	734	896	-	-	1273	-
Mov Cap-2 Maneuver	734	-	-	-	-	-
Stage 1	862	-	-	-	-	-
Stage 2	807	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.5	0	5.1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	816	1273	-
HCM Lane V/C Ratio	-	-	0.011	0.027	-
HCM Control Delay (s)	-	-	9.5	7.9	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0.1	-

Intersection						
Int Delay, s/veh	4.2					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	181	73	72	215	134	69
Future Vol, veh/h	181	73	72	215	134	69
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	200	-	200	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	181	73	72	215	134	69

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	254	0	577	218
Stage 1	-	-	-	-	218	-
Stage 2	-	-	-	-	359	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1311	-	478	822
Stage 1	-	-	-	-	818	-
Stage 2	-	-	-	-	707	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1311	-	452	822
Mov Cap-2 Maneuver	-	-	-	-	537	-
Stage 1	-	-	-	-	818	-
Stage 2	-	-	-	-	668	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2	12.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	537	822	-	-	1311	-
HCM Lane V/C Ratio	0.25	0.084	-	-	0.055	-
HCM Control Delay (s)	13.9	9.8	-	-	7.9	-
HCM Lane LOS	B	A	-	-	A	-
HCM 95th %tile Q(veh)	1	0.3	-	-	0.2	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	98	263	526	226	306	131	620	1374	231	85	918	61
Future Volume (veh/h)	98	263	526	226	306	131	620	1374	231	85	918	61
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	98	263	526	226	306	131	620	1374	231	85	918	61
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	144	750	634	257	977	436	653	1565	263	119	1141	76
Arrive On Green	0.08	0.21	0.21	0.14	0.27	0.27	0.19	0.36	0.36	0.07	0.23	0.23
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	3456	4402	740	1781	4892	324
Grp Volume(v), veh/h	98	263	526	226	306	131	620	1062	543	85	638	341
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1728	1702	1737	1781	1702	1812
Q Serve(g_s), s	4.8	5.7	19.0	11.2	6.1	5.9	16.0	26.3	26.3	4.2	15.9	16.0
Cycle Q Clear(g_c), s	4.8	5.7	19.0	11.2	6.1	5.9	16.0	26.3	26.3	4.2	15.9	16.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.43	1.00		0.18
Lane Grp Cap(c), veh/h	144	750	634	257	977	436	653	1210	618	119	794	423
V/C Ratio(X)	0.68	0.35	0.83	0.88	0.31	0.30	0.95	0.88	0.88	0.72	0.80	0.81
Avail Cap(c_a), veh/h	198	750	634	257	977	436	653	1210	618	119	794	423
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.2	30.2	24.2	37.7	25.9	25.8	36.1	27.2	27.2	41.2	32.6	32.6
Incr Delay (d2), s/veh	5.6	0.3	9.1	27.3	0.2	0.4	23.5	9.2	16.2	18.5	8.5	15.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	2.4	11.1	6.7	2.6	2.2	8.7	11.7	13.2	2.4	7.3	8.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.8	30.5	33.3	65.0	26.1	26.2	59.6	36.3	43.4	59.7	41.0	47.7
LnGrp LOS	D	C	C	E	C	C	E	D	D	E	D	D
Approach Vol, veh/h		887			663			2225			1064	
Approach Delay, s/veh		33.9			39.4			44.5			44.6	
Approach LOS		C			D			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.0	37.0	18.0	24.0	22.0	26.0	12.3	29.7				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	5.0	31.0	12.0	18.0	16.0	20.0	9.0	21.0				
Max Q Clear Time (g_c+I1), s	6.2	28.3	13.2	21.0	18.0	18.0	6.8	8.1				
Green Ext Time (p_c), s	0.0	2.2	0.0	0.0	0.0	1.2	0.0	2.0				
Intersection Summary												
HCM 6th Ctrl Delay			41.9									
HCM 6th LOS			D									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	847	3	535	546	1762	0	0	1340	448
Future Volume (veh/h)	0	0	0	847	3	535	546	1762	0	0	1340	448
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1752	1752	1752	1841	1841	0	0	1856	1856
Adj Flow Rate, veh/h				1015	0	358	546	1762	0	0	1340	448
Peak Hour Factor				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %				10	10	10	4	4	0	0	3	3
Cap, veh/h				1181	0	525	657	2667	0	0	1786	440
Arrive On Green				0.35	0.00	0.35	0.19	0.53	0.00	0.00	0.28	0.28
Sat Flow, veh/h				3337	0	1485	3401	5191	0	0	6643	1572
Grp Volume(v), veh/h				1015	0	358	546	1762	0	0	1340	448
Grp Sat Flow(s),veh/h/ln				1668	0	1485	1700	1675	0	0	1596	1572
Q Serve(g_s), s				24.5	0.0	17.8	13.4	22.0	0.0	0.0	16.6	24.2
Cycle Q Clear(g_c), s				24.5	0.0	17.8	13.4	22.0	0.0	0.0	16.6	24.2
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				1181	0	525	657	2667	0	0	1786	440
V/C Ratio(X)				0.86	0.00	0.68	0.83	0.66	0.00	0.00	0.75	1.02
Avail Cap(c_a), veh/h				1309	0	582	706	2667	0	0	1786	440
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				26.0	0.0	23.8	33.6	14.7	0.0	0.0	28.5	31.2
Incr Delay (d2), s/veh				5.6	0.0	2.8	7.8	1.3	0.0	0.0	3.0	47.7
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				10.1	0.0	6.4	5.7	6.9	0.0	0.0	6.0	14.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				31.5	0.0	26.7	41.5	16.0	0.0	0.0	31.4	78.9
LnGrp LOS				C	A	C	D	B	A	A	C	F
Approach Vol, veh/h					1373			2308			1788	
Approach Delay, s/veh					30.3			22.0			43.3	
Approach LOS					C			C			D	

Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		51.0			21.8	29.2		35.7				
Change Period (Y+Rc), s		6.0			6.0	6.0		6.0				
Max Green Setting (Gmax), s		45.0			17.0	22.0		33.0				
Max Q Clear Time (g_c+I1), s		24.0			15.4	26.2		26.5				
Green Ext Time (p_c), s		12.0			0.4	0.0		3.2				

Intersection Summary		
HCM 6th Ctrl Delay		31.1
HCM 6th LOS		C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	632	0	674	0	0	0	0	1703	872	511	1715	0
Future Volume (veh/h)	632	0	674	0	0	0	0	1703	872	511	1715	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1767	1767	1767				0	1781	1781	1796	1796	0
Adj Flow Rate, veh/h	848	0	442				0	1703	872	511	1715	0
Peak Hour Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	9	9	9				0	8	8	7	7	0
Cap, veh/h	823	0	366				0	1513	705	406	2199	0
Arrive On Green	0.24	0.00	0.24				0.00	0.47	0.47	0.12	0.64	0.00
Sat Flow, veh/h	3365	0	1497				0	3403	1510	3319	3503	0
Grp Volume(v), veh/h	848	0	442				0	1703	872	511	1715	0
Grp Sat Flow(s),veh/h/ln	1682	0	1497				0	1621	1510	1659	1706	0
Q Serve(g_s), s	22.0	0.0	22.0				0.0	42.0	42.0	11.0	32.3	0.0
Cycle Q Clear(g_c), s	22.0	0.0	22.0				0.0	42.0	42.0	11.0	32.3	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	823	0	366				0	1513	705	406	2199	0
V/C Ratio(X)	1.03	0.00	1.21				0.00	1.13	1.24	1.26	0.78	0.00
Avail Cap(c_a), veh/h	823	0	366				0	1513	705	406	2199	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	34.0	0.0	34.0				0.0	24.0	24.0	39.5	11.4	0.0
Incr Delay (d2), s/veh	39.6	0.0	116.4				0.0	65.7	118.9	135.5	2.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.2	0.0	19.6				0.0	27.0	35.6	11.8	9.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	73.6	0.0	150.4				0.0	89.7	142.9	175.0	14.3	0.0
LnGrp LOS	F	A	F				A	F	F	F	B	A
Approach Vol, veh/h		1290						2575			2226	
Approach Delay, s/veh		99.9						107.7			51.1	
Approach LOS		F						F			D	

Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	16.0	47.0		27.0		63.0						
Change Period (Y+Rc), s	6.0	6.0		6.0		6.0						
Max Green Setting (Gmax), s	10.0	41.0		21.0		57.0						
Max Q Clear Time (g_c+I1), s	13.0	44.0		24.0		34.3						
Green Ext Time (p_c), s	0.0	0.0		0.0		12.8						

Intersection Summary			
HCM 6th Ctrl Delay			85.4
HCM 6th LOS			F

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	566	124	207	35	31	82	81	1768	26	58	1906	422
Future Volume (veh/h)	566	124	207	35	31	82	81	1768	26	58	1906	422
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1411	1411	1411	1767	1767	1767	1707	1707	1707
Adj Flow Rate, veh/h	566	124	207	35	31	82	81	1768	26	58	1906	422
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	7	7	7	33	33	33	9	9	9	13	13	13
Cap, veh/h	415	579	491	295	432	385	112	1545	23	89	1182	252
Arrive On Green	0.32	0.32	0.32	0.32	0.32	0.32	0.07	0.46	0.46	0.05	0.44	0.44
Sat Flow, veh/h	1229	1796	1522	791	1340	1196	1682	3386	50	1626	2660	567
Grp Volume(v), veh/h	566	124	207	35	31	82	81	875	919	58	1134	1194
Grp Sat Flow(s),veh/h/ln	1229	1796	1522	791	1340	1196	1682	1678	1758	1626	1622	1605
Q Serve(g_s), s	24.5	4.5	9.6	3.0	1.4	4.5	4.2	41.1	41.1	3.1	40.0	40.0
Cycle Q Clear(g_c), s	29.0	4.5	9.6	7.6	1.4	4.5	4.2	41.1	41.1	3.1	40.0	40.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.03	1.00		0.35
Lane Grp Cap(c), veh/h	415	579	491	295	432	385	112	766	802	89	721	713
V/C Ratio(X)	1.36	0.21	0.42	0.12	0.07	0.21	0.72	1.14	1.15	0.65	1.57	1.67
Avail Cap(c_a), veh/h	415	579	491	295	432	385	112	766	802	108	721	713
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.1	22.2	23.9	25.0	21.2	22.2	41.2	24.5	24.5	41.7	25.0	25.0
Incr Delay (d2), s/veh	179.1	0.2	0.6	0.2	0.1	0.3	20.3	79.3	80.3	9.6	264.7	309.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	29.5	1.8	3.3	0.6	0.4	1.2	2.3	30.4	32.1	1.4	65.8	73.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	214.2	22.4	24.5	25.1	21.2	22.5	61.4	103.8	104.8	51.3	289.7	334.2
LnGrp LOS	F	C	C	C	C	C	E	F	F	D	F	F
Approach Vol, veh/h		897			148			1875			2386	
Approach Delay, s/veh		143.9			22.8			102.4			306.1	
Approach LOS		F			C			F			F	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.9	46.1		34.0	11.0	45.0		34.0				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	5.0	39.0		28.0	5.0	39.0		28.0				
Max Q Clear Time (g_c+I1), s	5.1	43.1		31.0	6.2	42.0		9.6				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	0.0		0.7				
Intersection Summary												
HCM 6th Ctrl Delay			198.8									
HCM 6th LOS			F									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	252	34	146	67	20	117	100	1477	41	185	1675	246
Future Volume (veh/h)	252	34	146	67	20	117	100	1477	41	185	1675	246
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1707	1707	1707	1633	1633	1633	1752	1752	1752	1707	1707	1707
Adj Flow Rate, veh/h	252	34	146	67	20	117	100	1477	41	185	1675	246
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	13	13	13	18	18	18	10	10	10	13	13	13
Cap, veh/h	245	25	105	324	417	354	111	1507	42	199	1455	209
Arrive On Green	0.26	0.26	0.26	0.26	0.26	0.26	0.07	0.46	0.46	0.12	0.51	0.51
Sat Flow, veh/h	712	96	412	1051	1633	1384	1668	3308	92	1626	2847	408
Grp Volume(v), veh/h	432	0	0	67	20	117	100	742	776	185	937	984
Grp Sat Flow(s),veh/h/ln	1220	0	0	1051	1633	1384	1668	1664	1735	1626	1622	1634
Q Serve(g_s), s	22.2	0.0	0.0	0.0	0.8	6.2	5.4	39.4	39.6	10.1	46.0	46.0
Cycle Q Clear(g_c), s	23.0	0.0	0.0	5.0	0.8	6.2	5.4	39.4	39.6	10.1	46.0	46.0
Prop In Lane	0.58		0.34	1.00		1.00	1.00		0.05	1.00		0.25
Lane Grp Cap(c), veh/h	375	0	0	324	417	354	111	758	791	199	829	835
V/C Ratio(X)	1.15	0.00	0.00	0.21	0.05	0.33	0.90	0.98	0.98	0.93	1.13	1.18
Avail Cap(c_a), veh/h	375	0	0	324	417	354	111	758	791	199	829	835
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.8	0.0	0.0	26.8	25.2	27.2	41.7	24.1	24.1	39.1	22.0	22.0
Incr Delay (d2), s/veh	94.5	0.0	0.0	0.3	0.0	0.5	54.9	27.4	27.4	44.7	73.6	92.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	18.0	0.0	0.0	1.1	0.3	2.0	3.8	18.6	19.5	6.2	30.9	35.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	130.3	0.0	0.0	27.1	25.3	27.8	96.6	51.4	51.5	83.8	95.6	114.6
LnGrp LOS	F	A	A	C	C	C	F	D	D	F	F	F
Approach Vol, veh/h		432			204			1618			2106	
Approach Delay, s/veh		130.3			27.3			54.3			103.4	
Approach LOS		F			C			D			F	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	16.0	46.0		28.0	11.0	51.0		28.0				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	10.0	40.0		22.0	5.0	45.0		22.0				
Max Q Clear Time (g_c+I1), s	12.1	41.6		25.0	7.4	48.0		8.2				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	0.0		0.6				
Intersection Summary												
HCM 6th Ctrl Delay			84.3									
HCM 6th LOS			F									

Intersection	
Int Delay, s/veh	0.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	3	51	1402	9	55	1808
Future Vol, veh/h	3	51	1402	9	55	1808
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	200	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	32	32	9	9	12	12
Mvmt Flow	3	51	1402	9	55	1808

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2421	706	0	0	1411	0
Stage 1	1407	-	-	-	-	-
Stage 2	1014	-	-	-	-	-
Critical Hdwy	7.44	7.54	-	-	4.34	-
Critical Hdwy Stg 1	6.44	-	-	-	-	-
Critical Hdwy Stg 2	6.44	-	-	-	-	-
Follow-up Hdwy	3.82	3.62	-	-	2.32	-
Pot Cap-1 Maneuver	18	317	-	-	431	-
Stage 1	146	-	-	-	-	-
Stage 2	251	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	16	317	-	-	431	-
Mov Cap-2 Maneuver	87	-	-	-	-	-
Stage 1	146	-	-	-	-	-
Stage 2	219	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	21.2	0	0.4
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	276	431	-
HCM Lane V/C Ratio	-	-	0.196	0.128	-
HCM Control Delay (s)	-	-	21.2	14.6	-
HCM Lane LOS	-	-	C	B	-
HCM 95th %tile Q(veh)	-	-	0.7	0.4	-

Movement	EBL	EBR	NBU	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (veh/h)	31	163	2	102	1371	1754	83
Future Volume (veh/h)	31	163	2	102	1371	1754	83
Initial Q (Qb), veh	0	0		0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00			1.00
Parking Bus, Adj	1.00	1.00		1.00	1.00	1.00	1.00
Work Zone On Approach	No				No	No	
Adj Sat Flow, veh/h/ln	1870	1870		1870	1870	1870	1870
Adj Flow Rate, veh/h	31	163		102	1371	1754	83
Peak Hour Factor	1.00	1.00		1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2		2	2	2	2
Cap, veh/h	246	219		149	2632	2123	100
Arrive On Green	0.14	0.14		0.08	0.74	0.61	0.61
Sat Flow, veh/h	1781	1585		1781	3647	3549	162
Grp Volume(v), veh/h	31	163		102	1371	896	941
Grp Sat Flow(s),veh/h/ln	1781	1585		1781	1777	1777	1841
Q Serve(g_s), s	1.3	8.1		4.6	13.4	32.3	33.2
Cycle Q Clear(g_c), s	1.3	8.1		4.6	13.4	32.3	33.2
Prop In Lane	1.00	1.00		1.00			0.09
Lane Grp Cap(c), veh/h	246	219		149	2632	1092	1131
V/C Ratio(X)	0.13	0.75		0.68	0.52	0.82	0.83
Avail Cap(c_a), veh/h	411	366		149	2632	1092	1131
HCM Platoon Ratio	1.00	1.00		1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00		1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.1	34.1		36.7	4.5	12.4	12.5
Incr Delay (d2), s/veh	0.2	5.0		12.1	0.7	7.0	7.2
Initial Q Delay(d3),s/veh	0.0	0.0		0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	7.2		2.5	3.7	12.8	13.7
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	31.4	39.1		48.8	5.3	19.3	19.7
LnGrp LOS	C	D		D	A	B	B
Approach Vol, veh/h	194				1473	1837	
Approach Delay, s/veh	37.9				8.3	19.5	
Approach LOS	D				A	B	

Timer - Assigned Phs		2		4	5	6	
Phs Duration (G+Y+Rc), s		66.0		16.4	10.4	55.6	
Change Period (Y+Rc), s		6.0		6.0	4.5	6.0	
Max Green Setting (Gmax), s		60.0		18.0	5.9	49.6	
Max Q Clear Time (g_c+I1), s		15.4		10.1	6.6	35.2	
Green Ext Time (p_c), s		15.0		0.3	0.0	10.9	

Intersection Summary			
HCM 6th Ctrl Delay			15.8
HCM 6th LOS			B

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	253	46	74	7	1	6	28	1135	24	22	1282	249
Future Volume (veh/h)	253	46	74	7	1	6	28	1135	24	22	1282	249
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1648	1648	1648	1826	1826	1826	1737	1737	1737	1678	1678	1678
Adj Flow Rate, veh/h	253	46	74	7	1	6	28	1135	24	22	1282	249
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	17	17	17	5	5	5	11	11	11	15	15	15
Cap, veh/h	344	136	219	165	33	115	56	2001	42	48	1605	308
Arrive On Green	0.24	0.24	0.24	0.24	0.24	0.24	0.07	1.00	1.00	0.03	0.60	0.60
Sat Flow, veh/h	1241	569	915	501	139	480	1654	3305	70	1598	2667	512
Grp Volume(v), veh/h	253	0	120	14	0	0	28	567	592	22	761	770
Grp Sat Flow(s),veh/h/ln	1241	0	1483	1120	0	0	1654	1650	1724	1598	1594	1585
Q Serve(g_s), s	16.9	0.0	8.0	0.1	0.0	0.0	2.0	0.0	0.0	1.6	43.6	45.2
Cycle Q Clear(g_c), s	25.0	0.0	8.0	8.1	0.0	0.0	2.0	0.0	0.0	1.6	43.6	45.2
Prop In Lane	1.00		0.62	0.50		0.43	1.00		0.04	1.00		0.32
Lane Grp Cap(c), veh/h	344	0	355	313	0	0	56	999	1044	48	959	954
V/C Ratio(X)	0.74	0.00	0.34	0.04	0.00	0.00	0.50	0.57	0.57	0.46	0.79	0.81
Avail Cap(c_a), veh/h	388	0	408	363	0	0	83	999	1044	80	959	954
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.69	0.69	0.69
Uniform Delay (d), s/veh	44.6	0.0	37.7	35.1	0.0	0.0	55.0	0.0	0.0	57.2	18.2	18.5
Incr Delay (d2), s/veh	6.3	0.0	0.6	0.1	0.0	0.0	6.9	2.3	2.2	4.7	4.7	5.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.9	0.0	3.0	0.3	0.0	0.0	0.9	0.6	0.6	0.7	14.7	15.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.9	0.0	38.3	35.2	0.0	0.0	61.9	2.3	2.2	61.9	22.9	23.7
LnGrp LOS	D	A	D	D	A	A	E	A	A	E	C	C
Approach Vol, veh/h		373			14			1187			1553	
Approach Delay, s/veh		46.8			35.2			3.7			23.8	
Approach LOS		D			D			A			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.6	77.6		33.8	9.0	77.2		33.8				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	5.0	65.0		32.0	5.0	65.0		32.0				
Max Q Clear Time (g_c+I1), s	3.6	2.0		27.0	4.0	47.2		10.1				
Green Ext Time (p_c), s	0.0	8.2		0.8	0.0	9.3		0.0				

Intersection Summary			
HCM 6th Ctrl Delay			19.0
HCM 6th LOS			B

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	35	1167	7	9	1353
Future Vol, veh/h	0	35	1167	7	9	1353
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	35	1167	7	9	1353

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	587	0	0	1174	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	4.14	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	0	453	-	-	591	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	453	-	-	591	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.6	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	453	591	-
HCM Lane V/C Ratio	-	-	0.077	0.015	-
HCM Control Delay (s)	-	-	13.6	11.2	-
HCM Lane LOS	-	-	B	B	-
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	165	423	184	76	175	111	132	809	82	105	1075	144
Future Volume (veh/h)	165	423	184	76	175	111	132	809	82	105	1075	144
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1767	1767	1767	1604	1604	1604	1767	1767	1767	1781	1781	1781
Adj Flow Rate, veh/h	165	423	184	76	175	111	132	809	82	105	1075	144
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	9	9	9	20	20	20	9	9	9	8	8	8
Cap, veh/h	205	468	396	105	387	233	169	1287	130	139	1352	603
Arrive On Green	0.12	0.26	0.26	0.07	0.21	0.21	0.10	0.42	0.42	0.16	0.80	0.80
Sat Flow, veh/h	1682	1767	1497	1527	1829	1100	1682	3077	312	1697	3385	1510
Grp Volume(v), veh/h	165	423	184	76	144	142	132	441	450	105	1075	144
Grp Sat Flow(s),veh/h/ln	1682	1767	1497	1527	1523	1406	1682	1678	1710	1697	1692	1510
Q Serve(g_s), s	11.5	27.8	12.4	5.9	9.9	10.6	9.2	24.9	24.9	7.1	21.0	2.8
Cycle Q Clear(g_c), s	11.5	27.8	12.4	5.9	9.9	10.6	9.2	24.9	24.9	7.1	21.0	2.8
Prop In Lane	1.00		1.00	1.00		0.78	1.00		0.18	1.00		1.00
Lane Grp Cap(c), veh/h	205	468	396	105	322	297	169	702	715	139	1352	603
V/C Ratio(X)	0.81	0.90	0.46	0.73	0.45	0.48	0.78	0.63	0.63	0.76	0.80	0.24
Avail Cap(c_a), veh/h	294	501	424	115	322	297	182	702	715	156	1352	603
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.3	42.7	37.0	54.8	41.2	41.5	52.7	27.6	27.6	49.0	9.4	7.5
Incr Delay (d2), s/veh	10.1	19.1	0.8	18.6	1.0	1.2	18.1	4.2	4.2	17.0	4.9	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.3	14.1	4.5	2.7	3.7	3.7	4.6	10.0	10.2	3.4	4.1	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.4	61.8	37.8	73.4	42.2	42.7	70.7	31.8	31.7	66.0	14.3	8.5
LnGrp LOS	E	E	D	E	D	D	E	C	C	E	B	A
Approach Vol, veh/h		772			362			1023			1324	
Approach Delay, s/veh		56.0			48.9			36.8			17.7	
Approach LOS		E			D			D			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.8	55.2	13.2	36.8	17.1	52.9	19.6	30.4				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	10.0	45.0	8.0	33.0	12.0	43.0	20.0	21.0				
Max Q Clear Time (g_c+I1), s	9.1	26.9	7.9	29.8	11.2	23.0	13.5	12.6				
Green Ext Time (p_c), s	0.0	4.6	0.0	1.0	0.0	7.2	0.2	0.9				
Intersection Summary												
HCM 6th Ctrl Delay			35.1									
HCM 6th LOS			D									

Intersection	
Int Delay, s/veh	1.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	5	73	19	16	12
Future Vol, veh/h	5	5	73	19	16	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	50	50	50	50	50	50
Mvmt Flow	5	5	73	19	16	12

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	127	83	0	0	92	0
Stage 1	83	-	-	-	-	-
Stage 2	44	-	-	-	-	-
Critical Hdwy	6.9	6.7	-	-	4.6	-
Critical Hdwy Stg 1	5.9	-	-	-	-	-
Critical Hdwy Stg 2	5.9	-	-	-	-	-
Follow-up Hdwy	3.95	3.75	-	-	2.65	-
Pot Cap-1 Maneuver	765	859	-	-	1249	-
Stage 1	832	-	-	-	-	-
Stage 2	869	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	755	859	-	-	1249	-
Mov Cap-2 Maneuver	755	-	-	-	-	-
Stage 1	832	-	-	-	-	-
Stage 2	858	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.5	0	4.5
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	804	1249	-
HCM Lane V/C Ratio	-	-	0.012	0.013	-
HCM Control Delay (s)	-	-	9.5	7.9	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	3.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	275	146	70	208	81	92
Future Vol, veh/h	275	146	70	208	81	92
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	200	-	200	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	275	146	70	208	81	92

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	421	0	696	348
Stage 1	-	-	-	-	348	-
Stage 2	-	-	-	-	348	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1138	-	408	695
Stage 1	-	-	-	-	715	-
Stage 2	-	-	-	-	715	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1138	-	383	695
Mov Cap-2 Maneuver	-	-	-	-	490	-
Stage 1	-	-	-	-	715	-
Stage 2	-	-	-	-	671	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.1	12.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	490	695	-	-	1138	-
HCM Lane V/C Ratio	0.165	0.132	-	-	0.062	-
HCM Control Delay (s)	13.8	11	-	-	8.4	-
HCM Lane LOS	B	B	-	-	A	-
HCM 95th %tile Q(veh)	0.6	0.5	-	-	0.2	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	192	601	214	177	38	405	758	197	65	1269	30
Future Volume (veh/h)	38	192	601	214	177	38	405	758	197	65	1269	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	38	192	601	214	177	38	405	758	197	65	1269	30
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	80	750	564	218	1024	457	499	1565	403	103	1539	36
Arrive On Green	0.05	0.21	0.21	0.12	0.29	0.29	0.14	0.39	0.39	0.06	0.30	0.30
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	3456	4046	1041	1781	5131	121
Grp Volume(v), veh/h	38	192	601	214	177	38	405	636	319	65	842	457
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1728	1702	1683	1781	1702	1849
Q Serve(g_s), s	1.9	4.1	19.0	10.8	3.4	1.6	10.2	12.7	12.9	3.2	20.7	20.7
Cycle Q Clear(g_c), s	1.9	4.1	19.0	10.8	3.4	1.6	10.2	12.7	12.9	3.2	20.7	20.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.62	1.00		0.07
Lane Grp Cap(c), veh/h	80	750	564	218	1024	457	499	1316	651	103	1021	555
V/C Ratio(X)	0.47	0.26	1.07	0.98	0.17	0.08	0.81	0.48	0.49	0.63	0.82	0.82
Avail Cap(c_a), veh/h	119	750	564	218	1024	457	499	1316	651	158	1021	555
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.9	29.6	29.0	39.4	24.0	23.4	37.3	20.8	20.9	41.5	29.3	29.3
Incr Delay (d2), s/veh	4.2	0.2	56.8	55.9	0.1	0.1	9.8	1.3	2.6	6.2	7.5	13.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	1.7	20.5	8.0	1.4	0.6	4.9	5.1	5.4	1.6	9.2	10.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.2	29.8	85.8	95.4	24.1	23.4	47.1	22.1	23.5	47.7	36.8	42.4
LnGrp LOS	D	C	F	F	C	C	D	C	C	D	D	D
Approach Vol, veh/h		831			429			1360			1364	
Approach Delay, s/veh		71.1			59.6			29.9			39.2	
Approach LOS		E			E			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.2	39.8	16.0	24.0	18.0	32.0	9.1	30.9
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	7.0	31.0	10.0	18.0	12.0	26.0	5.0	23.0
Max Q Clear Time (g_c+I1), s	5.2	14.9	12.8	21.0	12.2	22.7	3.9	5.4
Green Ext Time (p_c), s	0.0	5.9	0.0	0.0	0.0	2.3	0.0	1.1

Intersection Summary	
HCM 6th Ctrl Delay	44.9
HCM 6th LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	827	5	419	596	1115	0	0	1240	588
Future Volume (veh/h)	0	0	0	827	5	419	596	1115	0	0	1240	588
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1737	1737	1737	1678	1678	0	0	1870	1870
Adj Flow Rate, veh/h				959	0	281	596	1115	0	0	1240	588
Peak Hour Factor				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %				11	11	11	15	15	0	0	2	2
Cap, veh/h				1092	0	486	694	2548	0	0	1774	437
Arrive On Green				0.33	0.00	0.33	0.22	0.56	0.00	0.00	0.28	0.28
Sat Flow, veh/h				3309	0	1472	3100	4731	0	0	6696	1585
Grp Volume(v), veh/h				959	0	281	596	1115	0	0	1240	588
Grp Sat Flow(s),veh/h/ln				1654	0	1472	1550	1527	0	0	1609	1585
Q Serve(g_s), s				24.1	0.0	13.9	16.3	12.6	0.0	0.0	15.2	24.3
Cycle Q Clear(g_c), s				24.1	0.0	13.9	16.3	12.6	0.0	0.0	15.2	24.3
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				1092	0	486	694	2548	0	0	1774	437
V/C Ratio(X)				0.88	0.00	0.58	0.86	0.44	0.00	0.00	0.70	1.35
Avail Cap(c_a), veh/h				1165	0	518	739	2548	0	0	1774	437
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				27.8	0.0	24.4	32.8	11.5	0.0	0.0	28.6	31.9
Incr Delay (d2), s/veh				7.6	0.0	1.4	9.5	0.5	0.0	0.0	2.3	170.2
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				10.3	0.0	4.9	6.4	3.5	0.0	0.0	5.5	28.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				35.4	0.0	25.9	42.4	12.0	0.0	0.0	30.9	202.0
LnGrp LOS				D	A	C	D	B	A	A	C	F
Approach Vol, veh/h					1240			1711			1828	
Approach Delay, s/veh					33.2			22.6			86.0	
Approach LOS					C			C			F	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		54.0			24.7	29.3		34.1				
Change Period (Y+Rc), s		6.0			6.0	6.0		6.0				
Max Green Setting (Gmax), s		48.0			20.0	22.0		30.0				
Max Q Clear Time (g_c+I1), s		14.6			18.3	26.3		26.1				
Green Ext Time (p_c), s		8.2			0.4	0.0		2.0				

Intersection Summary		
HCM 6th Ctrl Delay		49.6
HCM 6th LOS		D

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	379	8	752	0	0	0	0	1329	684	426	1643	0
Future Volume (veh/h)	379	8	752	0	0	0	0	1329	684	426	1643	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1693	1693	1693				0	1574	1574	1796	1796	0
Adj Flow Rate, veh/h	255	0	890				0	1329	684	426	1643	0
Peak Hour Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	14	14	14				0	22	22	7	7	0
Cap, veh/h	430	0	765				0	1273	593	406	2124	0
Arrive On Green	0.27	0.00	0.27				0.00	0.44	0.44	0.12	0.62	0.00
Sat Flow, veh/h	1612	0	2869				0	3006	1334	3319	3503	0
Grp Volume(v), veh/h	255	0	890				0	1329	684	426	1643	0
Grp Sat Flow(s),veh/h/ln	1612	0	1434				0	1432	1334	1659	1706	0
Q Serve(g_s), s	12.4	0.0	24.0				0.0	40.0	40.0	11.0	31.6	0.0
Cycle Q Clear(g_c), s	12.4	0.0	24.0				0.0	40.0	40.0	11.0	31.6	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	430	0	765				0	1273	593	406	2124	0
V/C Ratio(X)	0.59	0.00	1.16				0.00	1.04	1.15	1.05	0.77	0.00
Avail Cap(c_a), veh/h	430	0	765				0	1273	593	406	2124	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	28.7	0.0	33.0				0.0	25.0	25.0	39.5	12.4	0.0
Incr Delay (d2), s/veh	2.2	0.0	87.6				0.0	37.5	87.3	58.5	2.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.9	0.0	17.4				0.0	17.9	24.9	7.4	9.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.9	0.0	120.6				0.0	62.5	112.3	98.0	15.2	0.0
LnGrp LOS	C	A	F				A	F	F	F	B	A
Approach Vol, veh/h		1145						2013			2069	
Approach Delay, s/veh		100.6						79.4			32.2	
Approach LOS		F						E			C	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	16.0	45.0		29.0		61.0
Change Period (Y+Rc), s	6.0	6.0		6.0		6.0
Max Green Setting (Gmax), s	10.0	39.0		23.0		55.0
Max Q Clear Time (g_c+I1), s	13.0	42.0		26.0		33.6
Green Ext Time (p_c), s	0.0	0.0		0.0		11.8

Intersection Summary	
HCM 6th Ctrl Delay	65.4
HCM 6th LOS	E

Notes
User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	424	21	135	38	29	61	142	1459	32	44	1765	569
Future Volume (veh/h)	424	21	135	38	29	61	142	1459	32	44	1765	569
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1693	1693	1693	1455	1455	1455	1500	1500	1500	1722	1722	1722
Adj Flow Rate, veh/h	424	21	135	38	29	61	142	1459	32	44	1765	569
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	14	14	14	30	30	30	27	27	27	12	12	12
Cap, veh/h	332	428	363	312	349	312	110	1524	33	79	1248	381
Arrive On Green	0.25	0.25	0.25	0.25	0.25	0.25	0.08	0.53	0.53	0.05	0.51	0.51
Sat Flow, veh/h	1182	1693	1434	958	1383	1233	1428	2851	62	1640	2468	754
Grp Volume(v), veh/h	424	21	135	38	29	61	142	728	763	44	1137	1197
Grp Sat Flow(s),veh/h/ln	1182	1693	1434	958	1383	1233	1428	1425	1489	1640	1636	1586
Q Serve(g_s), s	19.5	0.9	7.1	2.8	1.5	3.5	7.0	44.3	44.5	2.4	46.0	46.0
Cycle Q Clear(g_c), s	23.0	0.9	7.1	3.7	1.5	3.5	7.0	44.3	44.5	2.4	46.0	46.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.04	1.00		0.48
Lane Grp Cap(c), veh/h	332	428	363	312	349	312	110	762	796	79	827	802
V/C Ratio(X)	1.28	0.05	0.37	0.12	0.08	0.20	1.29	0.96	0.96	0.56	1.37	1.49
Avail Cap(c_a), veh/h	332	428	363	312	349	312	110	762	796	108	827	802
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.1	25.7	28.0	27.1	26.0	26.7	42.0	20.2	20.2	42.4	22.5	22.5
Incr Delay (d2), s/veh	146.0	0.0	0.6	0.2	0.1	0.3	183.5	22.5	22.2	6.1	176.3	228.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	20.7	0.3	2.3	0.6	0.5	1.0	7.9	16.3	17.1	1.0	54.7	64.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	184.1	25.8	28.7	27.3	26.1	27.0	225.5	42.6	42.5	48.5	198.8	250.8
LnGrp LOS	F	C	C	C	C	C	F	D	D	D	F	F
Approach Vol, veh/h		580			128			1633			2378	
Approach Delay, s/veh		142.2			26.9			58.5			222.2	
Approach LOS		F			C			E			F	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.4	53.6		28.0	12.0	51.0		28.0
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0
Max Green Setting (Gmax), s	5.0	45.0		22.0	6.0	45.0		22.0
Max Q Clear Time (g_c+I1), s	4.4	46.5		25.0	9.0	48.0		5.7
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	0.0		0.5

Intersection Summary	
HCM 6th Ctrl Delay	150.4
HCM 6th LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	349	79	125	55	74	125	100	1199	61	240	1341	295
Future Volume (veh/h)	349	79	125	55	74	125	100	1199	61	240	1341	295
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1411	1411	1411	625	625	625	1574	1574	1574	1678	1678	1678
Adj Flow Rate, veh/h	349	79	125	55	74	125	100	1199	61	240	1341	295
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	33	33	33	86	86	86	22	22	22	15	15	15
Cap, veh/h	244	40	64	225	229	194	100	1030	52	178	1043	225
Arrive On Green	0.37	0.37	0.37	0.37	0.37	0.37	0.07	0.36	0.36	0.11	0.40	0.40
Sat Flow, veh/h	486	110	174	394	625	530	1499	2896	147	1598	2607	564
Grp Volume(v), veh/h	553	0	0	55	74	125	100	619	641	240	811	825
Grp Sat Flow(s),veh/h/ln	770	0	0	394	625	530	1499	1495	1547	1598	1594	1576
Q Serve(g_s), s	25.4	0.0	0.0	0.0	7.6	17.6	6.0	32.0	32.0	10.0	36.0	36.0
Cycle Q Clear(g_c), s	33.0	0.0	0.0	9.2	7.6	17.6	6.0	32.0	32.0	10.0	36.0	36.0
Prop In Lane	0.63		0.23	1.00		1.00	1.00		0.10	1.00		0.36
Lane Grp Cap(c), veh/h	348	0	0	225	229	194	100	532	550	178	638	631
V/C Ratio(X)	1.59	0.00	0.00	0.24	0.32	0.64	1.00	1.16	1.17	1.35	1.27	1.31
Avail Cap(c_a), veh/h	348	0	0	225	229	194	100	532	550	178	638	631
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.7	0.0	0.0	21.0	20.5	23.6	42.0	29.0	29.0	40.0	27.0	27.0
Incr Delay (d2), s/veh	278.9	0.0	0.0	0.6	0.8	7.0	90.2	92.8	92.9	190.7	134.4	150.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	34.5	0.0	0.0	0.8	1.1	2.4	4.6	23.7	24.5	13.0	35.5	37.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	313.6	0.0	0.0	21.5	21.3	30.7	132.2	121.8	121.9	230.7	161.4	177.1
LnGrp LOS	F	A	A	C	C	C	F	F	F	F	F	F
Approach Vol, veh/h		553			254			1360			1876	
Approach Delay, s/veh		313.6			26.0			122.6			177.2	
Approach LOS		F			C			F			F	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	15.0	37.0		38.0	11.0	41.0		38.0				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	9.0	31.0		32.0	5.0	35.0		32.0				
Max Q Clear Time (g_c+I1), s	12.0	34.0		35.0	8.0	38.0		19.6				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	0.0		1.3				
Intersection Summary												
HCM 6th Ctrl Delay			168.0									
HCM 6th LOS			F									

Intersection	
Int Delay, s/veh	1.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	82	1157	7	169	1273
Future Vol, veh/h	0	82	1157	7	169	1273
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	200	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	59	59	20	20	15	15
Mvmt Flow	0	82	1157	7	169	1273

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2136	582	0	0	1164	0
Stage 1	1161	-	-	-	-	-
Stage 2	975	-	-	-	-	-
Critical Hdwy	7.98	8.08	-	-	4.4	-
Critical Hdwy Stg 1	6.98	-	-	-	-	-
Critical Hdwy Stg 2	6.98	-	-	-	-	-
Follow-up Hdwy	4.09	3.89	-	-	2.35	-
Pot Cap-1 Maneuver	21	338	-	-	527	-
Stage 1	167	-	-	-	-	-
Stage 2	220	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	14	338	-	-	527	-
Mov Cap-2 Maneuver	78	-	-	-	-	-
Stage 1	167	-	-	-	-	-
Stage 2	149	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	19	0	1.8
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	338	527	-
HCM Lane V/C Ratio	-	-	0.243	0.321	-
HCM Control Delay (s)	-	-	19	15	-
HCM Lane LOS	-	-	C	C	-
HCM 95th %tile Q(veh)	-	-	0.9	1.4	-

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	59	141	80	1136	1258	79
Future Volume (veh/h)	59	141	80	1136	1258	79
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	59	141	80	1136	1258	79
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	376	335	178	2409	1773	111
Arrive On Green	0.21	0.21	0.10	0.68	0.52	0.52
Sat Flow, veh/h	1781	1585	1781	3647	3489	213
Grp Volume(v), veh/h	59	141	80	1136	657	680
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1777	1777	1832
Q Serve(g_s), s	2.4	6.9	3.8	13.6	25.2	25.4
Cycle Q Clear(g_c), s	2.4	6.9	3.8	13.6	25.2	25.4
Prop In Lane	1.00	1.00	1.00			0.12
Lane Grp Cap(c), veh/h	376	335	178	2409	928	957
V/C Ratio(X)	0.16	0.42	0.45	0.47	0.71	0.71
Avail Cap(c_a), veh/h	376	335	178	2409	928	957
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.0	30.7	38.2	6.9	16.3	16.3
Incr Delay (d2), s/veh	0.9	3.9	8.0	0.7	4.6	4.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	6.7	2.0	4.5	10.6	11.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	29.9	34.6	46.1	7.5	20.9	20.8
LnGrp LOS	C	C	D	A	C	C
Approach Vol, veh/h	200			1216	1337	
Approach Delay, s/veh	33.2			10.1	20.8	
Approach LOS	C			B	C	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		66.0		24.0	14.0	52.0
Change Period (Y+Rc), s		6.0		6.0	6.0	6.0
Max Green Setting (Gmax), s		60.0		18.0	8.0	46.0
Max Q Clear Time (g_c+I1), s		15.6		8.9	5.8	27.4
Green Ext Time (p_c), s		11.2		0.4	0.0	9.3
Intersection Summary						
HCM 6th Ctrl Delay			17.0			
HCM 6th LOS			B			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	204	45	29	29	5	5	34	1024	69	8	1270	250
Future Volume (veh/h)	204	45	29	29	5	5	34	1024	69	8	1270	250
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1337	1337	1337	1085	1085	1085	1633	1633	1633	1633	1633	1633
Adj Flow Rate, veh/h	204	45	29	29	5	5	34	1024	69	8	1270	250
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	38	38	38	55	55	55	18	18	18	18	18	18
Cap, veh/h	289	172	111	160	24	19	57	1860	125	28	1585	309
Arrive On Green	0.23	0.23	0.23	0.23	0.23	0.23	0.07	1.00	1.00	0.02	0.61	0.61
Sat Flow, veh/h	1004	759	489	477	106	86	1555	2950	199	1555	2590	504
Grp Volume(v), veh/h	204	0	74	39	0	0	34	538	555	8	756	764
Grp Sat Flow(s),veh/h/ln	1004	0	1249	668	0	0	1555	1552	1597	1555	1552	1542
Q Serve(g_s), s	13.6	0.0	5.8	4.0	0.0	0.0	2.5	0.0	0.0	0.6	44.2	45.8
Cycle Q Clear(g_c), s	23.5	0.0	5.8	9.9	0.0	0.0	2.5	0.0	0.0	0.6	44.2	45.8
Prop In Lane	1.00		0.39	0.74		0.13	1.00		0.12	1.00		0.33
Lane Grp Cap(c), veh/h	289	0	283	204	0	0	57	978	1007	28	950	944
V/C Ratio(X)	0.71	0.00	0.26	0.19	0.00	0.00	0.60	0.55	0.55	0.28	0.80	0.81
Avail Cap(c_a), veh/h	329	0	333	236	0	0	78	978	1007	78	950	944
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.74	0.74	0.74
Uniform Delay (d), s/veh	45.0	0.0	38.2	41.0	0.0	0.0	54.8	0.0	0.0	58.1	17.6	17.9
Incr Delay (d2), s/veh	5.8	0.0	0.5	0.5	0.0	0.0	9.6	2.2	2.2	4.0	5.2	5.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.4	0.0	1.9	1.0	0.0	0.0	1.1	0.6	0.6	0.3	14.5	15.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.8	0.0	38.7	41.5	0.0	0.0	64.4	2.2	2.2	62.2	22.8	23.5
LnGrp LOS	D	A	D	D	A	A	E	A	A	E	C	C
Approach Vol, veh/h		278			39			1127			1528	
Approach Delay, s/veh		47.6			41.5			4.1			23.4	
Approach LOS		D			D			A			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.2	80.7		32.2	9.4	78.4		32.2				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	5.0	66.0		31.0	5.0	66.0		31.0				
Max Q Clear Time (g_c+I1), s	2.6	2.0		25.5	4.5	47.8		11.9				
Green Ext Time (p_c), s	0.0	7.6		0.7	0.0	9.3		0.1				
Intersection Summary												
HCM 6th Ctrl Delay			18.6									
HCM 6th LOS			B									
Notes												

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	11	1121	17	21	1307
Future Vol, veh/h	0	11	1121	17	21	1307
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	11	1121	17	21	1307

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	569	0	0	1138	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	4.14	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	0	465	-	-	610	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	465	-	-	610	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.9	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	465	610	-
HCM Lane V/C Ratio	-	-	0.024	0.034	-
HCM Control Delay (s)	-	-	12.9	11.1	-
HCM Lane LOS	-	-	B	B	-
HCM 95th %tile Q(veh)	-	-	0.1	0.1	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	158	99	78	100	290	91	131	773	37	55	998	158
Future Volume (veh/h)	158	99	78	100	290	91	131	773	37	55	998	158
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1604	1604	1604	1678	1678	1678	1693	1693	1693	1737	1737	1737
Adj Flow Rate, veh/h	158	99	78	100	290	91	131	773	37	55	998	158
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	20	20	20	15	15	15	14	14	14	11	11	11
Cap, veh/h	193	304	258	134	354	109	167	1594	76	82	1505	671
Arrive On Green	0.13	0.19	0.19	0.08	0.15	0.15	0.10	0.51	0.51	0.10	0.91	0.91
Sat Flow, veh/h	1527	1604	1359	1598	2400	738	1612	3124	149	1654	3300	1472
Grp Volume(v), veh/h	158	99	78	100	191	190	131	398	412	55	998	158
Grp Sat Flow(s),veh/h/ln	1527	1604	1359	1598	1594	1545	1612	1608	1666	1654	1650	1472
Q Serve(g_s), s	12.1	6.4	5.9	7.3	13.9	14.4	9.5	19.3	19.3	3.9	8.1	1.4
Cycle Q Clear(g_c), s	12.1	6.4	5.9	7.3	13.9	14.4	9.5	19.3	19.3	3.9	8.1	1.4
Prop In Lane	1.00		1.00	1.00		0.48	1.00		0.09	1.00		1.00
Lane Grp Cap(c), veh/h	193	304	258	134	235	228	167	820	850	82	1505	671
V/C Ratio(X)	0.82	0.33	0.30	0.75	0.81	0.83	0.78	0.48	0.49	0.67	0.66	0.24
Avail Cap(c_a), veh/h	229	307	260	186	252	245	201	820	850	138	1505	671
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.1	42.0	41.8	53.7	49.5	49.7	52.5	19.1	19.1	53.1	3.2	2.9
Incr Delay (d2), s/veh	17.9	0.6	0.7	9.9	16.8	20.4	15.3	2.0	2.0	9.2	2.3	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5	2.5	2.0	3.2	6.5	6.7	4.4	7.0	7.2	1.7	1.7	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	69.1	42.6	42.4	63.6	66.3	70.1	67.8	21.2	21.1	62.3	5.5	3.8
LnGrp LOS	E	D	D	E	E	E	E	C	C	E	A	A
Approach Vol, veh/h		335			481			941			1211	
Approach Delay, s/veh		55.0			67.3			27.6			7.9	
Approach LOS		E			E			C			A	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.9	66.2	15.1	27.8	17.4	59.7	20.1	22.7
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	9.0	52.0	13.0	22.0	14.0	47.0	17.0	18.0
Max Q Clear Time (g_c+I1), s	5.9	21.3	9.3	8.4	11.5	10.1	14.1	16.4
Green Ext Time (p_c), s	0.0	4.7	0.1	0.5	0.1	8.0	0.1	0.3

Intersection Summary	
HCM 6th Ctrl Delay	29.1
HCM 6th LOS	C

Intersection						
Int Delay, s/veh	5.2					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	19	35	31	91	134	19
Future Vol, veh/h	19	35	31	91	134	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	50	50	50	50	50	50
Mvmt Flow	19	35	31	91	134	19

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	364	77	0	0	122	0
Stage 1	77	-	-	-	-	-
Stage 2	287	-	-	-	-	-
Critical Hdwy	6.9	6.7	-	-	4.6	-
Critical Hdwy Stg 1	5.9	-	-	-	-	-
Critical Hdwy Stg 2	5.9	-	-	-	-	-
Follow-up Hdwy	3.95	3.75	-	-	2.65	-
Pot Cap-1 Maneuver	550	866	-	-	1215	-
Stage 1	838	-	-	-	-	-
Stage 2	664	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	489	866	-	-	1215	-
Mov Cap-2 Maneuver	489	-	-	-	-	-
Stage 1	838	-	-	-	-	-
Stage 2	590	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.7	0	7.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	681	1215	-
HCM Lane V/C Ratio	-	-	0.079	0.11	-
HCM Control Delay (s)	-	-	10.7	8.3	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0.4	-

Intersection	
Int Delay, s/veh	4.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	181	73	74	215	134	74
Future Vol, veh/h	181	73	74	215	134	74
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	200	-	200	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	181	73	74	215	134	74

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	254	0	581	218
Stage 1	-	-	-	-	218	-
Stage 2	-	-	-	-	363	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1311	-	476	822
Stage 1	-	-	-	-	818	-
Stage 2	-	-	-	-	704	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1311	-	449	822
Mov Cap-2 Maneuver	-	-	-	-	534	-
Stage 1	-	-	-	-	818	-
Stage 2	-	-	-	-	665	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2	12.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	534	822	-	-	1311	-
HCM Lane V/C Ratio	0.251	0.09	-	-	0.056	-
HCM Control Delay (s)	14	9.8	-	-	7.9	-
HCM Lane LOS	B	A	-	-	A	-
HCM 95th %tile Q(veh)	1	0.3	-	-	0.2	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	98	263	526	226	306	131	620	1387	231	85	924	61
Future Volume (veh/h)	98	263	526	226	306	131	620	1387	231	85	924	61
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	98	263	526	226	306	131	620	1387	231	85	924	61
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	144	750	634	277	977	436	653	1568	261	119	1142	75
Arrive On Green	0.08	0.21	0.21	0.16	0.27	0.27	0.19	0.36	0.36	0.07	0.23	0.23
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	3456	4409	734	1781	4894	322
Grp Volume(v), veh/h	98	263	526	226	306	131	620	1071	547	85	642	343
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1728	1702	1738	1781	1702	1812
Q Serve(g_s), s	4.8	5.7	19.0	11.0	6.1	5.9	16.0	26.6	26.6	4.2	16.0	16.1
Cycle Q Clear(g_c), s	4.8	5.7	19.0	11.0	6.1	5.9	16.0	26.6	26.6	4.2	16.0	16.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.42	1.00		0.18
Lane Grp Cap(c), veh/h	144	750	634	277	977	436	653	1210	618	119	794	423
V/C Ratio(X)	0.68	0.35	0.83	0.82	0.31	0.30	0.95	0.88	0.89	0.72	0.81	0.81
Avail Cap(c_a), veh/h	198	750	634	277	977	436	653	1210	618	119	794	423
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.2	30.2	24.2	36.8	25.9	25.8	36.1	27.3	27.3	41.2	32.6	32.6
Incr Delay (d2), s/veh	5.6	0.3	9.1	17.0	0.2	0.4	23.5	9.6	16.9	18.5	8.7	15.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	2.4	11.1	6.0	2.6	2.2	8.7	11.9	13.5	2.4	7.4	8.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.8	30.5	33.3	53.7	26.1	26.2	59.6	36.9	44.2	59.6	41.3	48.1
LnGrp LOS	D	C	C	D	C	C	E	D	D	E	D	D
Approach Vol, veh/h		887			663			2238			1070	
Approach Delay, s/veh		33.9			35.5			45.0			44.9	
Approach LOS		C			D			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.0	37.0	18.0	24.0	22.0	26.0	12.3	29.7				
Change Period (Y+Rc), s	6.0	6.0	5.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	5.0	31.0	13.0	18.0	16.0	20.0	9.0	21.0				
Max Q Clear Time (g_c+I1), s	6.2	28.6	13.0	21.0	18.0	18.1	6.8	8.1				
Green Ext Time (p_c), s	0.0	1.9	0.0	0.0	0.0	1.2	0.0	2.0				

Intersection Summary			
HCM 6th Ctrl Delay			41.6
HCM 6th LOS			D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	878	3	535	615	1775	0	0	1346	448
Future Volume (veh/h)	0	0	0	878	3	535	615	1775	0	0	1346	448
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1752	1752	1752	1841	1841	0	0	1856	1856
Adj Flow Rate, veh/h				1046	0	358	615	1775	0	0	1346	448
Peak Hour Factor				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %				10	10	10	4	4	0	0	3	3
Cap, veh/h				1200	0	534	718	2644	0	0	1647	406
Arrive On Green				0.36	0.00	0.36	0.21	0.53	0.00	0.00	0.26	0.26
Sat Flow, veh/h				3337	0	1485	3401	5191	0	0	6643	1572
Grp Volume(v), veh/h				1046	0	358	615	1775	0	0	1346	448
Grp Sat Flow(s),veh/h/ln				1668	0	1485	1700	1675	0	0	1596	1572
Q Serve(g_s), s				25.6	0.0	17.8	15.2	22.6	0.0	0.0	17.3	22.6
Cycle Q Clear(g_c), s				25.6	0.0	17.8	15.2	22.6	0.0	0.0	17.3	22.6
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				1200	0	534	718	2644	0	0	1647	406
V/C Ratio(X)				0.87	0.00	0.67	0.86	0.67	0.00	0.00	0.82	1.10
Avail Cap(c_a), veh/h				1298	0	577	739	2644	0	0	1647	406
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				26.1	0.0	23.6	33.2	15.2	0.0	0.0	30.5	32.4
Incr Delay (d2), s/veh				6.4	0.0	2.7	9.6	1.4	0.0	0.0	4.6	76.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				10.7	0.0	6.4	6.6	7.2	0.0	0.0	6.5	16.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				32.5	0.0	26.4	42.9	16.6	0.0	0.0	35.1	108.5
LnGrp LOS				C	A	C	D	B	A	A	D	F
Approach Vol, veh/h					1404			2390			1794	
Approach Delay, s/veh					31.0			23.3			53.4	
Approach LOS					C			C			D	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		51.0			23.4	27.6		36.4				
Change Period (Y+Rc), s		6.0			6.0	6.0		6.0				
Max Green Setting (Gmax), s		45.0			18.0	21.0		33.0				
Max Q Clear Time (g_c+I1), s		24.6			17.2	24.6		27.6				
Green Ext Time (p_c), s		11.8			0.2	0.0		2.9				
Intersection Summary												
HCM 6th Ctrl Delay			34.9									
HCM 6th LOS			C									

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	632	0	690	0	0	0	0	1752	908	511	1737	0
Future Volume (veh/h)	632	0	690	0	0	0	0	1752	908	511	1737	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1767	1767	1767				0	1781	1781	1796	1796	0
Adj Flow Rate, veh/h	856	0	450				0	1752	908	511	1737	0
Peak Hour Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	9	9	9				0	8	8	7	7	0
Cap, veh/h	823	0	366				0	1514	704	406	2199	0
Arrive On Green	0.24	0.00	0.24				0.00	0.47	0.47	0.12	0.64	0.00
Sat Flow, veh/h	3365	0	1497				0	3404	1508	3319	3503	0
Grp Volume(v), veh/h	856	0	450				0	1751	909	511	1737	0
Grp Sat Flow(s),veh/h/ln	1682	0	1497				0	1621	1510	1659	1706	0
Q Serve(g_s), s	22.0	0.0	22.0				0.0	42.0	42.0	11.0	33.2	0.0
Cycle Q Clear(g_c), s	22.0	0.0	22.0				0.0	42.0	42.0	11.0	33.2	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	823	0	366				0	1513	705	406	2199	0
V/C Ratio(X)	1.04	0.00	1.23				0.00	1.16	1.29	1.26	0.79	0.00
Avail Cap(c_a), veh/h	823	0	366				0	1513	705	406	2199	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	34.0	0.0	34.0				0.0	24.0	24.0	39.5	11.6	0.0
Incr Delay (d2), s/veh	42.4	0.0	125.1				0.0	78.6	141.1	135.5	3.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.6	0.0	20.5				0.0	29.8	40.0	11.8	9.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	76.4	0.0	159.1				0.0	102.6	165.1	175.0	14.6	0.0
LnGrp LOS	F	A	F				A	F	F	F	B	A
Approach Vol, veh/h		1306						2660			2248	
Approach Delay, s/veh		104.9						124.0			51.0	
Approach LOS		F						F			D	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	16.0	47.0		27.0		63.0						
Change Period (Y+Rc), s	6.0	6.0		6.0		6.0						
Max Green Setting (Gmax), s	10.0	41.0		21.0		57.0						
Max Q Clear Time (g_c+I1), s	13.0	44.0		24.0		35.2						
Green Ext Time (p_c), s	0.0	0.0		0.0		12.7						
Intersection Summary												
HCM 6th Ctrl Delay			93.6									
HCM 6th LOS			F									

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	566	124	209	37	31	82	86	1852	31	58	1943	422
Future Volume (veh/h)	566	124	209	37	31	82	86	1852	31	58	1943	422
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1411	1411	1411	1767	1767	1767	1707	1707	1707
Adj Flow Rate, veh/h	566	124	209	37	31	82	86	1852	31	58	1943	422
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	7	7	7	33	33	33	9	9	9	13	13	13
Cap, veh/h	400	559	474	285	417	372	112	1579	26	89	1216	255
Arrive On Green	0.31	0.31	0.31	0.31	0.31	0.31	0.07	0.47	0.47	0.05	0.46	0.46
Sat Flow, veh/h	1229	1796	1522	790	1340	1196	1682	3378	56	1626	2670	559
Grp Volume(v), veh/h	566	124	209	37	31	82	86	918	965	58	1152	1213
Grp Sat Flow(s),veh/h/ln	1229	1796	1522	790	1340	1196	1682	1678	1756	1626	1622	1607
Q Serve(g_s), s	23.4	4.6	9.9	3.3	1.5	4.6	4.5	42.1	42.1	3.1	41.0	41.0
Cycle Q Clear(g_c), s	28.0	4.6	9.9	7.9	1.5	4.6	4.5	42.1	42.1	3.1	41.0	41.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.03	1.00		0.35
Lane Grp Cap(c), veh/h	400	559	474	285	417	372	112	784	821	89	739	732
V/C Ratio(X)	1.41	0.22	0.44	0.13	0.07	0.22	0.77	1.17	1.18	0.65	1.56	1.66
Avail Cap(c_a), veh/h	400	559	474	285	417	372	112	784	821	108	739	732
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.6	22.9	24.8	25.9	21.9	22.9	41.3	24.0	24.0	41.7	24.5	24.5
Incr Delay (d2), s/veh	201.0	0.2	0.6	0.2	0.1	0.3	26.7	89.9	91.8	9.6	258.3	301.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	30.9	1.8	3.4	0.6	0.4	1.2	2.6	33.3	35.3	1.4	66.1	74.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	236.6	23.1	25.4	26.1	21.9	23.2	68.0	113.9	115.8	51.3	282.8	326.2
LnGrp LOS	F	C	C	C	C	C	E	F	F	D	F	F
Approach Vol, veh/h		899			150			1969			2423	
Approach Delay, s/veh		158.1			23.7			112.8			299.0	
Approach LOS		F			C			F			F	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.9	47.1		33.0	11.0	46.0		33.0
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0
Max Green Setting (Gmax), s	5.0	40.0		27.0	5.0	40.0		27.0
Max Q Clear Time (g_c+I1), s	5.1	44.1		30.0	6.5	43.0		9.9
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	0.0		0.7

Intersection Summary			
HCM 6th Ctrl Delay			200.7
HCM 6th LOS			F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	252	34	147	67	20	117	103	1572	41	185	1717	246
Future Volume (veh/h)	252	34	147	67	20	117	103	1572	41	185	1717	246
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1707	1707	1707	1633	1633	1633	1752	1752	1752	1707	1707	1707
Adj Flow Rate, veh/h	252	34	147	67	20	117	103	1572	41	185	1717	246
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	13	13	13	18	18	18	10	10	10	13	13	13
Cap, veh/h	245	24	106	324	417	354	111	1547	40	181	1461	204
Arrive On Green	0.26	0.26	0.26	0.26	0.26	0.26	0.07	0.47	0.47	0.11	0.51	0.51
Sat Flow, veh/h	710	96	414	1051	1633	1384	1668	3314	86	1626	2858	400
Grp Volume(v), veh/h	433	0	0	67	20	117	103	788	825	185	956	1007
Grp Sat Flow(s),veh/h/ln	1220	0	0	1051	1633	1384	1668	1664	1736	1626	1622	1635
Q Serve(g_s), s	22.2	0.0	0.0	0.0	0.8	6.2	5.5	42.0	42.0	10.0	46.0	46.0
Cycle Q Clear(g_c), s	23.0	0.0	0.0	5.1	0.8	6.2	5.5	42.0	42.0	10.0	46.0	46.0
Prop In Lane	0.58		0.34	1.00		1.00	1.00		0.05	1.00		0.24
Lane Grp Cap(c), veh/h	375	0	0	324	417	354	111	777	810	181	829	836
V/C Ratio(X)	1.15	0.00	0.00	0.21	0.05	0.33	0.93	1.01	1.02	1.02	1.15	1.20
Avail Cap(c_a), veh/h	375	0	0	324	417	354	111	777	810	181	829	836
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.8	0.0	0.0	26.8	25.2	27.2	41.8	24.0	24.0	40.0	22.0	22.0
Incr Delay (d2), s/veh	95.5	0.0	0.0	0.3	0.0	0.5	62.3	35.9	36.3	73.4	82.7	103.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	18.1	0.0	0.0	1.1	0.3	2.0	4.0	21.3	22.4	7.4	33.0	38.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	131.3	0.0	0.0	27.1	25.3	27.8	104.1	59.9	60.3	113.4	104.7	125.3
LnGrp LOS	F	A	A	C	C	C	F	F	F	F	F	F
Approach Vol, veh/h		433			204			1716			2148	
Approach Delay, s/veh		131.3			27.3			62.8			115.1	
Approach LOS		F			C			E			F	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	15.0	47.0		28.0	11.0	51.0		28.0				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	9.0	41.0		22.0	5.0	45.0		22.0				
Max Q Clear Time (g_c+I1), s	12.0	44.0		25.0	7.5	48.0		8.2				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	0.0		0.6				

Intersection Summary			
HCM 6th Ctrl Delay			92.7
HCM 6th LOS			F

Intersection	
Int Delay, s/veh	1.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	3	149	1402	9	98	1808
Future Vol, veh/h	3	149	1402	9	98	1808
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	200	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	32	32	9	9	12	12
Mvmt Flow	3	149	1402	9	98	1808

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2507	706	0	0	1411	0
Stage 1	1407	-	-	-	-	-
Stage 2	1100	-	-	-	-	-
Critical Hdwy	7.44	7.54	-	-	4.34	-
Critical Hdwy Stg 1	6.44	-	-	-	-	-
Critical Hdwy Stg 2	6.44	-	-	-	-	-
Follow-up Hdwy	3.82	3.62	-	-	2.32	-
Pot Cap-1 Maneuver	15	317	-	-	431	-
Stage 1	146	-	-	-	-	-
Stage 2	223	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	12	317	-	-	431	-
Mov Cap-2 Maneuver	78	-	-	-	-	-
Stage 1	146	-	-	-	-	-
Stage 2	172	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	28.9	0	0.8
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	299	431	-
HCM Lane V/C Ratio	-	-	0.508	0.227	-
HCM Control Delay (s)	-	-	28.9	15.8	-
HCM Lane LOS	-	-	D	C	-
HCM 95th %tile Q(veh)	-	-	2.7	0.9	-

Movement	EBL	EBR	NBU	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (veh/h)	31	163	2	102	1371	1754	83
Future Volume (veh/h)	31	163	2	102	1371	1754	83
Initial Q (Qb), veh	0	0		0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00			1.00
Parking Bus, Adj	1.00	1.00		1.00	1.00	1.00	1.00
Work Zone On Approach	No				No	No	
Adj Sat Flow, veh/h/ln	1870	1870		1870	1870	1870	1870
Adj Flow Rate, veh/h	31	163		102	1371	1754	83
Peak Hour Factor	1.00	1.00		1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2		2	2	2	2
Cap, veh/h	246	219		149	2632	2123	100
Arrive On Green	0.14	0.14		0.08	0.74	0.61	0.61
Sat Flow, veh/h	1781	1585		1781	3647	3549	162
Grp Volume(v), veh/h	31	163		102	1371	896	941
Grp Sat Flow(s),veh/h/ln	1781	1585		1781	1777	1777	1841
Q Serve(g_s), s	1.3	8.1		4.6	13.4	32.3	33.2
Cycle Q Clear(g_c), s	1.3	8.1		4.6	13.4	32.3	33.2
Prop In Lane	1.00	1.00		1.00			0.09
Lane Grp Cap(c), veh/h	246	219		149	2632	1092	1131
V/C Ratio(X)	0.13	0.75		0.68	0.52	0.82	0.83
Avail Cap(c_a), veh/h	411	366		149	2632	1092	1131
HCM Platoon Ratio	1.00	1.00		1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00		1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.1	34.1		36.7	4.5	12.4	12.5
Incr Delay (d2), s/veh	0.2	5.0		12.1	0.7	7.0	7.2
Initial Q Delay(d3),s/veh	0.0	0.0		0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	7.2		2.5	3.7	12.8	13.7
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	31.4	39.1		48.8	5.3	19.3	19.7
LnGrp LOS	C	D		D	A	B	B
Approach Vol, veh/h	194				1473	1837	
Approach Delay, s/veh	37.9				8.3	19.5	
Approach LOS	D				A	B	

Timer - Assigned Phs		2		4	5	6	
Phs Duration (G+Y+Rc), s		66.0		16.4	10.4	55.6	
Change Period (Y+Rc), s		6.0		6.0	4.5	6.0	
Max Green Setting (Gmax), s		60.0		18.0	5.9	49.6	
Max Q Clear Time (g_c+I1), s		15.4		10.1	6.6	35.2	
Green Ext Time (p_c), s		15.0		0.3	0.0	10.9	

Intersection Summary				
HCM 6th Ctrl Delay			15.8	
HCM 6th LOS			B	

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	253	48	74	51	6	6	28	1135	44	22	1282	249
Future Volume (veh/h)	253	48	74	51	6	6	28	1135	44	22	1282	249
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1648	1648	1648	1826	1826	1826	1737	1737	1737	1678	1678	1678
Adj Flow Rate, veh/h	253	48	74	51	6	6	28	1135	44	22	1282	249
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	17	17	17	5	5	5	11	11	11	15	15	15
Cap, veh/h	346	130	201	216	25	20	56	2016	78	48	1650	317
Arrive On Green	0.22	0.22	0.22	0.22	0.22	0.22	0.07	1.00	1.00	0.03	0.62	0.62
Sat Flow, veh/h	1236	585	901	726	114	88	1654	3239	126	1598	2667	512
Grp Volume(v), veh/h	253	0	122	63	0	0	28	578	601	22	761	770
Grp Sat Flow(s),veh/h/ln	1236	0	1486	928	0	0	1654	1650	1714	1598	1594	1585
Q Serve(g_s), s	9.9	0.0	8.3	4.5	0.0	0.0	2.0	0.0	0.0	1.6	41.8	43.2
Cycle Q Clear(g_c), s	22.7	0.0	8.3	12.8	0.0	0.0	2.0	0.0	0.0	1.6	41.8	43.2
Prop In Lane	1.00		0.61	0.81		0.10	1.00		0.07	1.00		0.32
Lane Grp Cap(c), veh/h	346	0	331	261	0	0	56	1027	1067	48	986	981
V/C Ratio(X)	0.73	0.00	0.37	0.24	0.00	0.00	0.50	0.56	0.56	0.46	0.77	0.79
Avail Cap(c_a), veh/h	411	0	409	329	0	0	83	1027	1067	80	986	981
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.50	0.50	0.50
Uniform Delay (d), s/veh	44.9	0.0	39.5	43.8	0.0	0.0	55.0	0.0	0.0	57.2	16.7	17.0
Incr Delay (d2), s/veh	5.4	0.0	0.7	0.5	0.0	0.0	6.9	2.2	2.2	3.4	3.0	3.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.8	0.0	3.2	1.7	0.0	0.0	0.9	0.6	0.6	0.7	13.5	13.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.3	0.0	40.2	44.3	0.0	0.0	61.9	2.2	2.2	60.6	19.7	20.2
LnGrp LOS	D	A	D	D	A	A	E	A	A	E	B	C
Approach Vol, veh/h		375			63			1207			1553	
Approach Delay, s/veh		47.0			44.3			3.6			20.5	
Approach LOS		D			D			A			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.6	79.7		31.7	9.0	79.3		31.7				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	5.0	65.0		32.0	5.0	65.0		32.0				
Max Q Clear Time (g_c+I1), s	3.6	2.0		24.7	4.0	45.2		14.8				
Green Ext Time (p_c), s	0.0	8.5		1.0	0.0	9.8		0.2				
Intersection Summary												
HCM 6th Ctrl Delay			17.7									
HCM 6th LOS			B									
Notes												

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	35	1187	7	9	1397
Future Vol, veh/h	0	35	1187	7	9	1397
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	35	1187	7	9	1397

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	597	0	0	1194	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	4.14	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	0	446	-	-	580	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	446	-	-	580	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.8	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	446	580	-
HCM Lane V/C Ratio	-	-	0.078	0.016	-
HCM Control Delay (s)	-	-	13.8	11.3	-
HCM Lane LOS	-	-	B	B	-
HCM 95th %tile Q(veh)	-	-	0.3	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	170	423	184	76	175	115	132	819	82	113	1099	156
Future Volume (veh/h)	170	423	184	76	175	115	132	819	82	113	1099	156
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1767	1767	1767	1604	1604	1604	1767	1767	1767	1781	1781	1781
Adj Flow Rate, veh/h	170	423	184	76	175	115	132	819	82	113	1099	156
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	9	9	9	20	20	20	9	9	9	8	8	8
Cap, veh/h	210	468	396	105	376	234	169	1274	127	147	1352	603
Arrive On Green	0.12	0.26	0.26	0.07	0.21	0.21	0.10	0.41	0.41	0.17	0.80	0.80
Sat Flow, veh/h	1682	1767	1497	1527	1803	1122	1682	3081	308	1697	3385	1510
Grp Volume(v), veh/h	170	423	184	76	146	144	132	446	455	113	1099	156
Grp Sat Flow(s),veh/h/ln	1682	1767	1497	1527	1523	1402	1682	1678	1711	1697	1692	1510
Q Serve(g_s), s	11.8	27.8	12.4	5.9	10.1	10.8	9.2	25.5	25.5	7.6	22.3	3.1
Cycle Q Clear(g_c), s	11.8	27.8	12.4	5.9	10.1	10.8	9.2	25.5	25.5	7.6	22.3	3.1
Prop In Lane	1.00		1.00	1.00		0.80	1.00		0.18	1.00		1.00
Lane Grp Cap(c), veh/h	210	468	396	105	318	292	169	694	707	147	1352	603
V/C Ratio(X)	0.81	0.90	0.46	0.73	0.46	0.49	0.78	0.64	0.64	0.77	0.81	0.26
Avail Cap(c_a), veh/h	294	501	424	115	318	292	182	694	707	156	1352	603
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.1	42.7	37.0	54.8	41.6	41.9	52.7	28.1	28.1	48.4	9.5	7.6
Incr Delay (d2), s/veh	10.9	19.1	0.8	18.6	1.0	1.3	18.1	4.5	4.5	19.5	5.4	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5	14.1	4.5	2.7	3.8	3.7	4.6	10.3	10.5	3.7	4.3	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	62.1	61.8	37.8	73.4	42.6	43.2	70.7	32.7	32.6	67.9	14.9	8.6
LnGrp LOS	E	E	D	E	D	D	E	C	C	E	B	A
Approach Vol, veh/h		777			366			1033			1368	
Approach Delay, s/veh		56.2			49.2			37.5			18.6	
Approach LOS		E			D			D			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.4	54.6	13.2	36.8	17.1	52.9	20.0	30.0
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	10.0	45.0	8.0	33.0	12.0	43.0	20.0	21.0
Max Q Clear Time (g_c+I1), s	9.6	27.5	7.9	29.8	11.2	24.3	13.8	12.8
Green Ext Time (p_c), s	0.0	4.6	0.0	1.0	0.0	7.2	0.2	0.9

Intersection Summary	
HCM 6th Ctrl Delay	35.5
HCM 6th LOS	D

Intersection	
Int Delay, s/veh	6.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	54	103	73	41	59	12
Future Vol, veh/h	54	103	73	41	59	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	50	50	50	50	50	50
Mvmt Flow	54	103	73	41	59	12

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	224	94	0	0	114	0
Stage 1	94	-	-	-	-	-
Stage 2	130	-	-	-	-	-
Critical Hdwy	6.9	6.7	-	-	4.6	-
Critical Hdwy Stg 1	5.9	-	-	-	-	-
Critical Hdwy Stg 2	5.9	-	-	-	-	-
Follow-up Hdwy	3.95	3.75	-	-	2.65	-
Pot Cap-1 Maneuver	669	846	-	-	1224	-
Stage 1	822	-	-	-	-	-
Stage 2	790	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	636	846	-	-	1224	-
Mov Cap-2 Maneuver	636	-	-	-	-	-
Stage 1	822	-	-	-	-	-
Stage 2	751	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11	0	6.7
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	760	1224	-
HCM Lane V/C Ratio	-	-	0.207	0.048	-
HCM Control Delay (s)	-	-	11	8.1	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.8	0.2	-

Intersection	
Int Delay, s/veh	3.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	275	146	75	208	81	94
Future Vol, veh/h	275	146	75	208	81	94
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	200	-	200	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	275	146	75	208	81	94

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	421	0	706	348
Stage 1	-	-	-	-	348	-
Stage 2	-	-	-	-	358	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1138	-	402	695
Stage 1	-	-	-	-	715	-
Stage 2	-	-	-	-	707	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1138	-	375	695
Mov Cap-2 Maneuver	-	-	-	-	484	-
Stage 1	-	-	-	-	715	-
Stage 2	-	-	-	-	660	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.2	12.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	484	695	-	-	1138	-
HCM Lane V/C Ratio	0.167	0.135	-	-	0.066	-
HCM Control Delay (s)	13.9	11	-	-	8.4	-
HCM Lane LOS	B	B	-	-	A	-
HCM 95th %tile Q(veh)	0.6	0.5	-	-	0.2	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	379	8	752	0	0	0	0	1329	684	426	1643	0
Future Volume (veh/h)	379	8	752	0	0	0	0	1329	684	426	1643	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1693	1693	1693				0	1574	1574	1796	1796	0
Adj Flow Rate, veh/h	255	0	890				0	1329	684	426	1643	0
Peak Hour Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	14	14	14				0	22	22	7	7	0
Cap, veh/h	501	0	892				0	1623	504	479	2833	0
Arrive On Green	0.31	0.00	0.31				0.00	0.38	0.38	0.14	0.58	0.00
Sat Flow, veh/h	1612	0	2869				0	4439	1334	3319	5065	0
Grp Volume(v), veh/h	255	0	890				0	1329	684	426	1643	0
Grp Sat Flow(s),veh/h/ln	1612	0	1434				0	1432	1334	1659	1635	0
Q Serve(g_s), s	11.7	0.0	27.9				0.0	25.1	34.0	11.3	19.1	0.0
Cycle Q Clear(g_c), s	11.7	0.0	27.9				0.0	25.1	34.0	11.3	19.1	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	501	0	892				0	1623	504	479	2833	0
V/C Ratio(X)	0.51	0.00	1.00				0.00	0.82	1.36	0.89	0.58	0.00
Avail Cap(c_a), veh/h	501	0	892				0	1623	504	479	2833	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	25.4	0.0	31.0				0.0	25.2	28.0	37.8	12.1	0.0
Incr Delay (d2), s/veh	0.8	0.0	29.4				0.0	4.7	173.4	18.2	0.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.5	0.0	12.9				0.0	8.1	33.6	5.5	5.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.2	0.0	60.4				0.0	30.0	201.4	55.9	12.9	0.0
LnGrp LOS	C	A	E				A	C	F	E	B	A
Approach Vol, veh/h		1145						2013			2069	
Approach Delay, s/veh		52.8						88.2			21.8	
Approach LOS		D						F			C	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	18.0	39.0		33.0		57.0
Change Period (Y+Rc), s	6.0	6.0		6.0		6.0
Max Green Setting (Gmax), s	12.0	33.0		27.0		51.0
Max Q Clear Time (g_c+I1), s	13.3	36.0		29.9		21.1
Green Ext Time (p_c), s	0.0	0.0		0.0		13.2

Intersection Summary			
HCM 6th Ctrl Delay			54.2
HCM 6th LOS			D

Notes
User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	424	21	135	38	29	61	142	1459	32	44	1765	569
Future Volume (veh/h)	424	21	135	38	29	61	142	1459	32	44	1765	569
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1693	1693	1693	1455	1455	1455	1500	1500	1500	1722	1722	1722
Adj Flow Rate, veh/h	424	21	135	38	29	61	142	1459	32	44	1765	569
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	14	14	14	30	30	30	27	27	27	12	12	12
Cap, veh/h	632	410	348	306	335	299	182	2207	48	81	2148	667
Arrive On Green	0.24	0.24	0.24	0.24	0.24	0.24	0.13	0.54	0.54	0.05	0.46	0.46
Sat Flow, veh/h	2294	1693	1434	958	1383	1233	1428	4123	90	1640	4701	1459
Grp Volume(v), veh/h	424	21	135	38	29	61	142	966	525	44	1765	569
Grp Sat Flow(s),veh/h/ln	1147	1693	1434	958	1383	1233	1428	1365	1484	1640	1567	1459
Q Serve(g_s), s	15.7	0.8	6.8	2.7	1.4	3.4	8.3	22.1	22.1	2.3	28.3	30.1
Cycle Q Clear(g_c), s	19.1	0.8	6.8	3.6	1.4	3.4	8.3	22.1	22.1	2.3	28.3	30.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.06	1.00		1.00
Lane Grp Cap(c), veh/h	632	410	348	306	335	299	182	1461	794	81	2148	667
V/C Ratio(X)	0.67	0.05	0.39	0.12	0.09	0.20	0.78	0.66	0.66	0.54	0.82	0.85
Avail Cap(c_a), veh/h	632	410	348	306	335	299	214	1481	805	133	2225	691
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.8	25.2	27.5	26.5	25.4	26.2	36.6	14.5	14.5	40.2	20.5	20.9
Incr Delay (d2), s/veh	2.8	0.1	0.7	0.2	0.1	0.3	14.3	1.1	2.0	5.6	2.5	9.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.3	0.3	2.3	0.6	0.4	1.0	3.4	5.6	6.3	1.0	9.0	10.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.5	25.2	28.2	26.7	25.5	26.5	51.0	15.6	16.5	45.9	23.0	30.8
LnGrp LOS	D	C	C	C	C	C	D	B	B	D	C	C
Approach Vol, veh/h		580			128			1633			2378	
Approach Delay, s/veh		34.2			26.3			18.9			25.3	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.3	51.4		26.0	16.1	44.6		26.0				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	6.0	46.0		20.0	12.0	40.0		20.0				
Max Q Clear Time (g_c+I1), s	4.3	24.1		21.1	10.3	32.1		5.6				
Green Ext Time (p_c), s	0.0	9.7		0.0	0.1	6.5		0.5				

Intersection Summary			
HCM 6th Ctrl Delay			24.2
HCM 6th LOS			C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	349	79	125	55	74	125	100	1199	61	240	1341	295
Future Volume (veh/h)	349	79	125	55	74	125	100	1199	61	240	1341	295
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1411	1411	1411	625	625	625	1574	1574	1574	1678	1678	1678
Adj Flow Rate, veh/h	349	79	125	55	74	125	100	1199	61	240	1341	295
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	33	33	33	86	86	86	22	22	22	15	15	15
Cap, veh/h	323	176	278	173	224	189	117	1334	68	250	1491	328
Arrive On Green	0.36	0.36	0.36	0.36	0.36	0.36	0.08	0.32	0.32	0.16	0.40	0.40
Sat Flow, veh/h	893	492	779	394	625	530	1499	4187	213	1598	3757	826
Grp Volume(v), veh/h	349	0	204	55	74	125	100	820	440	240	1090	546
Grp Sat Flow(s),veh/h/ln	893	0	1271	394	625	530	1499	1432	1536	1598	1527	1529
Q Serve(g_s), s	24.3	0.0	11.0	11.1	7.7	17.8	5.9	24.5	24.5	13.3	30.0	30.0
Cycle Q Clear(g_c), s	32.0	0.0	11.0	22.1	7.7	17.8	5.9	24.5	24.5	13.3	30.0	30.0
Prop In Lane	1.00		0.61	1.00		1.00	1.00		0.14	1.00		0.54
Lane Grp Cap(c), veh/h	323	0	454	173	224	189	117	913	489	250	1212	607
V/C Ratio(X)	1.08	0.00	0.45	0.32	0.33	0.66	0.85	0.90	0.90	0.96	0.90	0.90
Avail Cap(c_a), veh/h	323	0	454	173	224	189	117	928	497	250	1228	615
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.6	0.0	22.0	30.5	21.0	24.2	40.8	29.1	29.1	37.5	25.3	25.3
Incr Delay (d2), s/veh	73.7	0.0	0.7	1.0	0.9	8.2	42.0	11.4	18.9	45.9	9.1	16.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.5	0.0	3.2	1.1	1.1	2.5	3.4	8.9	10.5	8.0	10.8	12.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	109.4	0.0	22.7	31.5	21.8	32.3	82.8	40.5	48.0	83.4	34.4	41.6
LnGrp LOS	F	A	C	C	C	C	F	D	D	F	C	D
Approach Vol, veh/h		553			254			1360			1876	
Approach Delay, s/veh		77.4			29.1			46.1			42.8	
Approach LOS		E			C			D			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	19.0	33.5		37.0	12.0	40.5		37.0				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	13.0	28.0		31.0	6.0	35.0		31.0				
Max Q Clear Time (g_c+I1), s	15.3	26.5		34.0	7.9	32.0		24.1				
Green Ext Time (p_c), s	0.0	1.0		0.0	0.0	2.3		0.9				
Intersection Summary												
HCM 6th Ctrl Delay			47.8									
HCM 6th LOS			D									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	632	0	690	0	0	0	0	1752	908	511	1737	0
Future Volume (veh/h)	632	0	690	0	0	0	0	1752	908	511	1737	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1767	1767	1767				0	1781	1781	1796	1796	0
Adj Flow Rate, veh/h	856	0	450				0	1752	908	511	1737	0
Peak Hour Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	9	9	9				0	8	8	7	7	0
Cap, veh/h	972	0	433				0	1891	587	516	2942	0
Arrive On Green	0.29	0.00	0.29				0.00	0.39	0.39	0.16	0.60	0.00
Sat Flow, veh/h	3365	0	1497				0	5024	1510	3319	5065	0
Grp Volume(v), veh/h	856	0	450				0	1752	908	511	1737	0
Grp Sat Flow(s),veh/h/ln	1682	0	1497				0	1621	1510	1659	1635	0
Q Serve(g_s), s	21.8	0.0	26.0				0.0	31.0	35.0	13.8	19.7	0.0
Cycle Q Clear(g_c), s	21.8	0.0	26.0				0.0	31.0	35.0	13.8	19.7	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	972	0	433				0	1891	587	516	2942	0
V/C Ratio(X)	0.88	0.00	1.04				0.00	0.93	1.55	0.99	0.59	0.00
Avail Cap(c_a), veh/h	972	0	433				0	1891	587	516	2942	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	30.5	0.0	32.0				0.0	26.3	27.5	37.9	11.1	0.0
Incr Delay (d2), s/veh	9.4	0.0	54.2				0.0	9.3	254.3	36.9	0.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.8	0.0	15.6				0.0	11.9	52.3	7.8	5.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.0	0.0	86.2				0.0	35.6	281.8	74.8	12.0	0.0
LnGrp LOS	D	A	F				A	D	F	E	B	A
Approach Vol, veh/h		1306						2660			2248	
Approach Delay, s/veh		55.9						119.7			26.3	
Approach LOS		E						F			C	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	19.0	40.0		31.0		59.0						
Change Period (Y+Rc), s	6.0	6.0		6.0		6.0						
Max Green Setting (Gmax), s	13.0	34.0		25.0		53.0						
Max Q Clear Time (g_c+I1), s	15.8	37.0		28.0		21.7						
Green Ext Time (p_c), s	0.0	0.0		0.0		14.6						
Intersection Summary												
HCM 6th Ctrl Delay			72.5									
HCM 6th LOS			E									
Notes												

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	566	124	209	37	31	82	86	1852	31	58	1943	422
Future Volume (veh/h)	566	124	209	37	31	82	86	1852	31	58	1943	422
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1411	1411	1411	1767	1767	1767	1707	1707	1707
Adj Flow Rate, veh/h	566	124	209	37	31	82	86	1852	31	58	1943	422
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	7	7	7	33	33	33	9	9	9	13	13	13
Cap, veh/h	563	413	350	64	144	129	127	2111	35	94	1933	600
Arrive On Green	0.17	0.23	0.23	0.05	0.11	0.11	0.08	0.43	0.43	0.06	0.41	0.41
Sat Flow, veh/h	3319	1796	1522	1344	1340	1196	1682	4885	82	1626	4661	1447
Grp Volume(v), veh/h	566	124	209	37	31	82	86	1219	664	58	1943	422
Grp Sat Flow(s),veh/h/ln	1659	1796	1522	1344	1340	1196	1682	1608	1752	1626	1554	1447
Q Serve(g_s), s	13.5	4.5	9.8	2.1	1.7	5.2	4.0	27.6	27.6	2.8	33.0	19.2
Cycle Q Clear(g_c), s	13.5	4.5	9.8	2.1	1.7	5.2	4.0	27.6	27.6	2.8	33.0	19.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.05	1.00		1.00
Lane Grp Cap(c), veh/h	563	413	350	64	144	129	127	1390	757	94	1933	600
V/C Ratio(X)	1.01	0.30	0.60	0.58	0.21	0.64	0.68	0.88	0.88	0.62	1.01	0.70
Avail Cap(c_a), veh/h	563	560	474	130	320	286	127	1390	757	123	1933	600
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.0	25.4	27.4	37.1	32.4	34.0	35.8	20.7	20.7	36.6	23.3	19.2
Incr Delay (d2), s/veh	39.2	0.4	1.6	8.0	0.7	5.1	13.5	8.1	13.7	6.4	21.7	6.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.1	1.8	3.4	0.8	0.5	1.6	2.0	9.9	12.0	1.2	13.7	6.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	72.2	25.8	29.0	45.1	33.2	39.1	49.4	28.7	34.3	43.0	45.0	26.0
LnGrp LOS	F	C	C	D	C	D	D	C	C	D	F	C
Approach Vol, veh/h		899			150			1969			2423	
Approach Delay, s/veh		55.8			39.4			31.5			41.6	
Approach LOS		E			D			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.6	39.4	7.3	23.3	11.0	38.0	17.0	13.6
Change Period (Y+Rc), s	6.0	6.0	4.5	6.0	6.0	6.0	4.5	6.0
Max Green Setting (Gmax), s	5.0	32.0	6.7	23.8	5.0	32.0	12.5	18.0
Max Q Clear Time (g_c+I1), s	4.8	29.6	4.1	11.8	6.0	35.0	15.5	7.2
Green Ext Time (p_c), s	0.0	2.0	0.0	1.0	0.0	0.0	0.0	0.3

Intersection Summary		
HCM 6th Ctrl Delay		40.2
HCM 6th LOS		D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	252	34	147	67	20	117	103	1572	41	185	1717	246
Future Volume (veh/h)	252	34	147	67	20	117	103	1572	41	185	1717	246
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1707	1707	1707	1633	1633	1633	1752	1752	1752	1707	1707	1707
Adj Flow Rate, veh/h	252	34	147	67	20	117	103	1572	41	185	1717	246
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	13	13	13	18	18	18	10	10	10	13	13	13
Cap, veh/h	369	72	313	248	423	358	116	2160	56	189	2049	292
Arrive On Green	0.26	0.26	0.26	0.26	0.26	0.26	0.07	0.45	0.45	0.12	0.50	0.50
Sat Flow, veh/h	1143	280	1210	1051	1633	1384	1668	4793	125	1626	4122	587
Grp Volume(v), veh/h	252	0	181	67	20	117	103	1046	567	185	1292	671
Grp Sat Flow(s),veh/h/ln	1143	0	1490	1051	1633	1384	1668	1594	1729	1626	1554	1602
Q Serve(g_s), s	18.3	0.0	8.8	4.9	0.8	5.9	5.3	23.1	23.1	9.8	30.8	31.2
Cycle Q Clear(g_c), s	19.1	0.0	8.8	13.8	0.8	5.9	5.3	23.1	23.1	9.8	30.8	31.2
Prop In Lane	1.00		0.81	1.00		1.00	1.00		0.07	1.00		0.37
Lane Grp Cap(c), veh/h	369	0	386	248	423	358	116	1437	779	189	1545	796
V/C Ratio(X)	0.68	0.00	0.47	0.27	0.05	0.33	0.89	0.73	0.73	0.98	0.84	0.84
Avail Cap(c_a), veh/h	379	0	398	257	437	370	116	1556	844	189	1661	856
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.1	0.0	26.9	32.7	23.9	25.8	39.7	19.3	19.3	37.9	18.6	18.7
Incr Delay (d2), s/veh	4.8	0.0	0.9	0.6	0.0	0.5	49.8	1.6	2.9	59.1	3.7	7.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.2	0.0	3.1	1.2	0.3	1.9	3.6	7.4	8.3	6.7	9.6	10.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.9	0.0	27.8	33.3	24.0	26.3	89.5	20.9	22.3	97.1	22.3	26.0
LnGrp LOS	D	A	C	C	C	C	F	C	C	F	C	C
Approach Vol, veh/h		433			204			1716			2148	
Approach Delay, s/veh		32.5			28.4			25.5			29.9	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	15.0	43.8		27.3	11.0	47.8		27.3				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	9.0	41.0		22.0	5.0	45.0		22.0				
Max Q Clear Time (g_c+I1), s	11.8	25.1		21.1	7.3	33.2		15.8				
Green Ext Time (p_c), s	0.0	8.7		0.2	0.0	8.6		0.4				

Intersection Summary			
HCM 6th Ctrl Delay			28.4
HCM 6th LOS			C

Appendix G – Cumulative Project Assumptions

1. Where Traffic Impact Studies were available, PCE volumes were added directly to the turning movements at t hose intersections analyzed for those projects.
2. All other cumulative projects were assumed to access S. Riverside Avenue through the closest side street, with 80% of traffic traveling to I-10 and the remaining traffic traveling away from I-10. So, cumulative projects located north of I-10 were assumed to have 20% of their traffic distributed northward along S Riverside Avenue and 80% to I-10 via S Riverside Avenue. Cumulative projects located south of I-10 were assumed to have 80% of their traffic accessing I-10 via S. Riverside Avenue and 20% distributed southward via S Riverside Avenue. Trip generation results for these projects were summarized in Table 7 of the report.

Appendix H – Signal Warrant Analyses

Traffic Signal Warrant Analysis Workbook

6/12/2021

STUDY AND ANALYSIS INFORMATION

Analysis Date:	2021 Cumulative Build
Conducted By:	NV5
Agency/Company Name:	NV5

Is the intersection in a built-up area of an isolated community of <10,000 population? No

Major Street Information

Major Street Name and Route Number:	Riverside Ave
Major Street Approach #1 Direction:	N-Bound
Major Street Approach #2 Direction:	S-Bound

Number of Lanes for Moving Traffic on Each Major Street Approach: 3 LANE(S)
Speed Limit or 85th Percentile Speed on the Major Street: 55 MPH

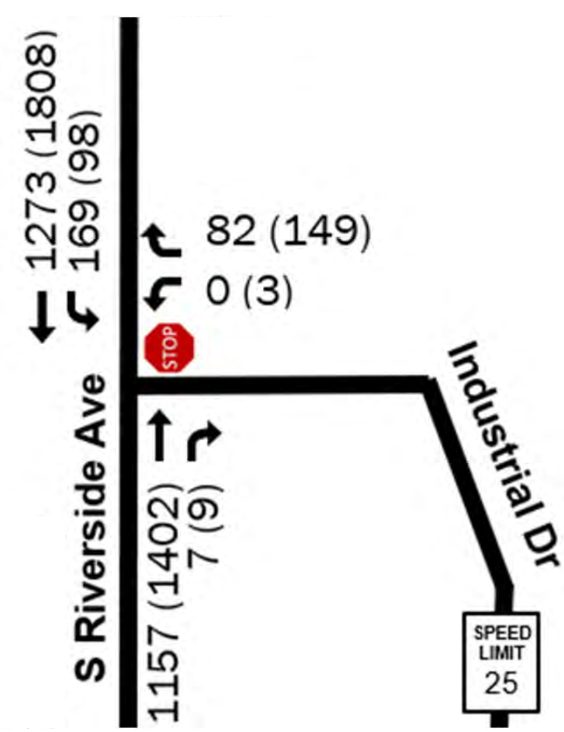
Minor Street Information

Minor Street Name and Route Number:	Industrial Drive
Minor Street Approach #1 Direction:	W-Bound
Minor Street Approach #2 Direction:	N/A

Number of Lanes for Moving Traffic on Each Minor Street Approach: 1 LANE(S)

TRAFFIC SIGNAL WARRANT ANALYSIS FINDINGS

	Applicable?	Warrant Met?
Warrant 1, Eight-Hour Vehicular Volume	Yes	No
Warrant 2, Four-Hour Vehicular Volume	Yes	No
Warrant 3, Peak Hour	Yes	Yes



MUTCD WARRANT 1, EIGHT-HOUR VEHICULAR VOLUME

Number of Lanes for Moving Traffic on Each Approach	
Major Street:	2 or More Lanes
Minor Street:	1 Lane

Built-up Isolated Community With Less Than 10,000 Population or Above 40 MPH on Major Street?	Yes

Combination of Conditions A and B Necessary?*: No

**Only applicable for Warrant 1 if after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems. See Section 4C.02 of the 2009 MUTCD for application.*

Condition A - Minimum Vehicular Volume

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor street approach (one direction only)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1	1	500	400	350	280	150	120	105	84
2 or More	1	600	480	420	336	150	120	105	84
2 or More	2 or More	600	480	420	336	200	160	140	112
1	2 or More	500	400	350	280	200	160	140	112

Condition B - Interruption of Continuous Traffic

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor street approach (one direction only)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1	1	750	600	525	420	75	60	53	42
2 or More	1	900	720	630	504	75	60	53	42
2 or More	2 or More	900	720	630	504	100	80	70	56
1	2 or More	750	600	525	420	100	80	70	56

Condition A Evaluation

Number of Unique Hours Met: 1

Condition A Satisfied? No

Condition B Evaluation

Number of Unique Hours Met: 2

Condition B Satisfied? No

Combination of Condition A and Condition B Evaluation

Number of Unique Hours Met for Condition A: N/A

Number of Unique Hours Met for Condition B: N/A

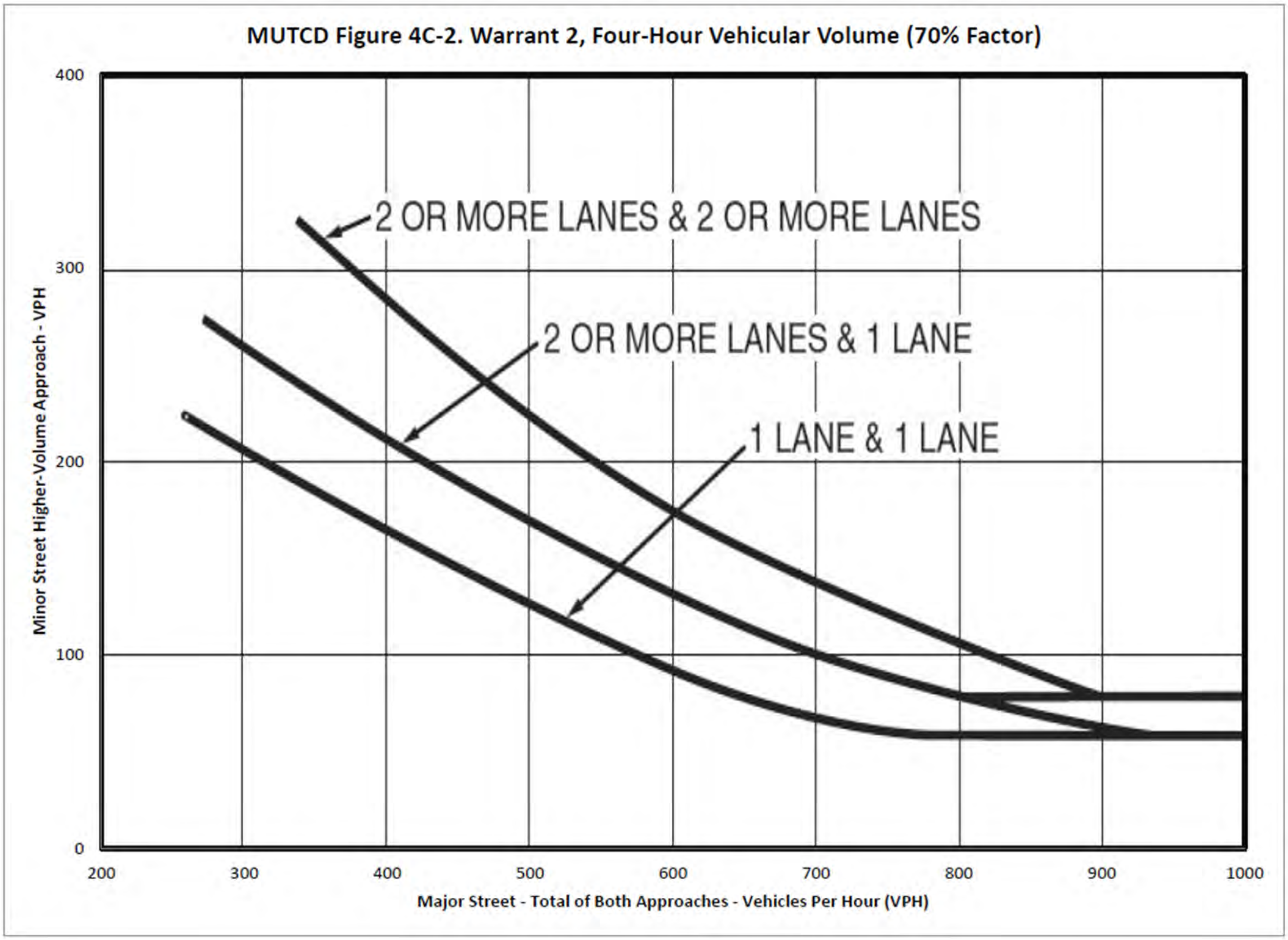
Combination of Condition A and Condition B Satisfied? N/A

MUTCD WARRANT 2, FOUR-HOUR VEHICULAR VOLUME

Number of Lanes for Moving Traffic on Each Approach	
Major Street:	2 or More Lanes
Minor Street:	1 Lane

Total Number of Unique Hours Met On Figure 4C-2
2

Built-up Isolated Community With Less Than 10,000 Population or Above 40 MPH on Major Street?	Yes



Total Major Street Traffic is greater than 1,000 vph.
Side Street Traffic is 82/152 vph in the AM/PM peak hours.

MUTCD WARRANT 3, PEAK HOUR

Number of Lanes for Moving Traffic on Each Approach	
Major Street:	2 or More Lanes
Minor Street:	1 Lane

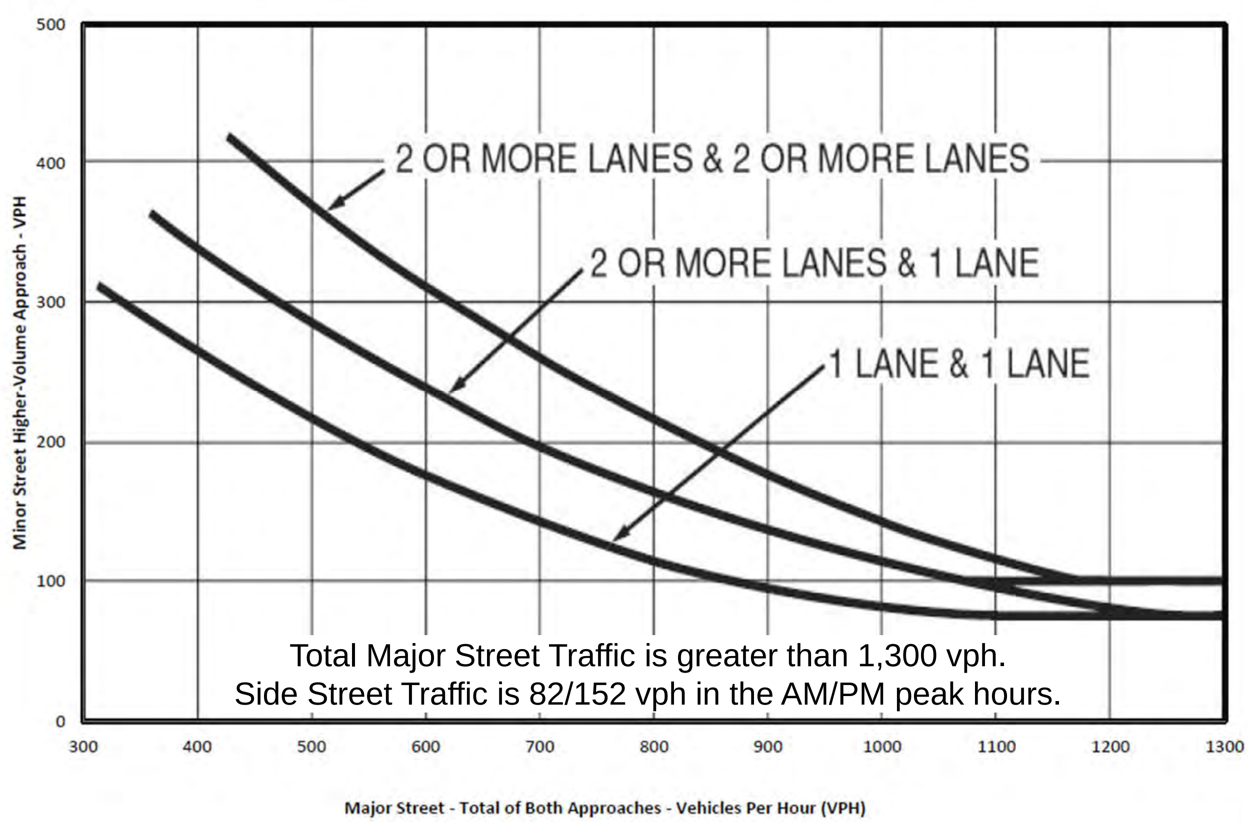
Total Number of Unique Hours Met On Figure 4C-4
2

Built-up Isolated Community With Less Than 10,000 Population or Above 40 MPH on Major Street?	Yes

Is this signal warrant being applied for an unusual case, such as office complexes, manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time?	Yes

Indicate whether all three of the following conditions for the same 1 hour (any four consecutive 15-minute periods) of an average day are present*	
Does the total stopped time delay experienced by the traffic on one minor-street approach (one direction only) controlled by a STOP sign equal or exceed 4 vehicle-hours for a one-lane approach or 5 vehicle-hours for a two-lane approach?	No
Does the volume on the same minor-street approach (one direction only) equal or exceed 100 vehicles per hour for one moving lane of traffic or 150 vehicles per hour for two moving lanes?	Yes in the PM
Does the total entering volume serviced during the hour equal or exceed 650 vehicles per hour for intersection with three approaches or 800 vehicles per hour for intersections with four or more approaches?	Yes
If applicable, attach all supporting calculations and documentation.	

MUTCD Figure 4C-4. Warrant 3, Peak Hour (70% Factor)



Traffic Signal Warrant Analysis Workbook

6/12/2021

STUDY AND ANALYSIS INFORMATION

Analysis Date:	2021 Cumulative Build
Conducted By:	NV5
Agency/Company Name:	NV5

Major Street Information

Major Street Name and Route Number:	Riverside Ave
Major Street Approach #1 Direction:	N-Bound
Major Street Approach #2 Direction:	S-Bound

Number of Lanes for Moving Traffic on Each Major Street Approach:	3	LANE(S)
Speed Limit or 85th Percentile Speed on the Major Street:	55	MPH

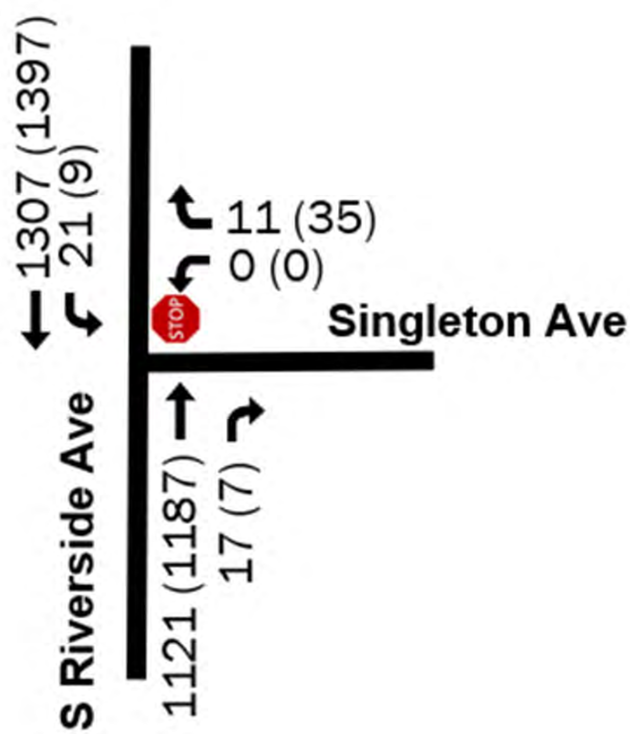
Minor Street Information

Minor Street Name and Route Number:	Singleton Ave
Minor Street Approach #1 Direction:	W-Bound
Minor Street Approach #2 Direction:	N/A

Number of Lanes for Moving Traffic on Each Minor Street Approach:	1	LANE(S)

TRAFFIC SIGNAL WARRANT ANALYSIS FINDINGS

	Applicable?	Warrant Met?
Warrant 1, Eight-Hour Vehicular Volume	Yes	No
Warrant 2, Four-Hour Vehicular Volume	Yes	No
Warrant 3, Peak Hour	Yes	No



MUTCD WARRANT 1, EIGHT-HOUR VEHICULAR VOLUME

Number of Lanes for Moving Traffic on Each Approach	
Major Street:	2 or More Lanes
Minor Street:	1 Lane

Built-up Isolated Community With Less Than 10,000 Population or Above 40 MPH on Major Street?	Yes

Combination of Conditions A and B Necessary?*: No

**Only applicable for Warrant 1 if after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems. See Section 4C.02 of the 2009 MUTCD for application.*

Condition A - Minimum Vehicular Volume

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor street approach (one direction only)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1	1	500	400	350	280	150	120	105	84
2 or More	1	600	480	420	336	150	120	105	84
2 or More	2 or More	600	480	420	336	200	160	140	112
1	2 or More	500	400	350	280	200	160	140	112

Condition B - Interruption of Continuous Traffic

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor street approach (one direction only)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1	1	750	600	525	420	75	60	53	42
2 or More	1	900	720	630	504	75	60	53	42
2 or More	2 or More	900	720	630	504	100	80	70	56
1	2 or More	750	600	525	420	100	80	70	56

Condition A Evaluation

Number of Unique Hours Met: 0 **Condition A Satisfied?** No

Condition B Evaluation

Number of Unique Hours Met: 0 **Condition B Satisfied?** No

Combination of Condition A and Condition B Evaluation

Number of Unique Hours Met for Condition A: N/A

Number of Unique Hours Met for Condition B: N/A

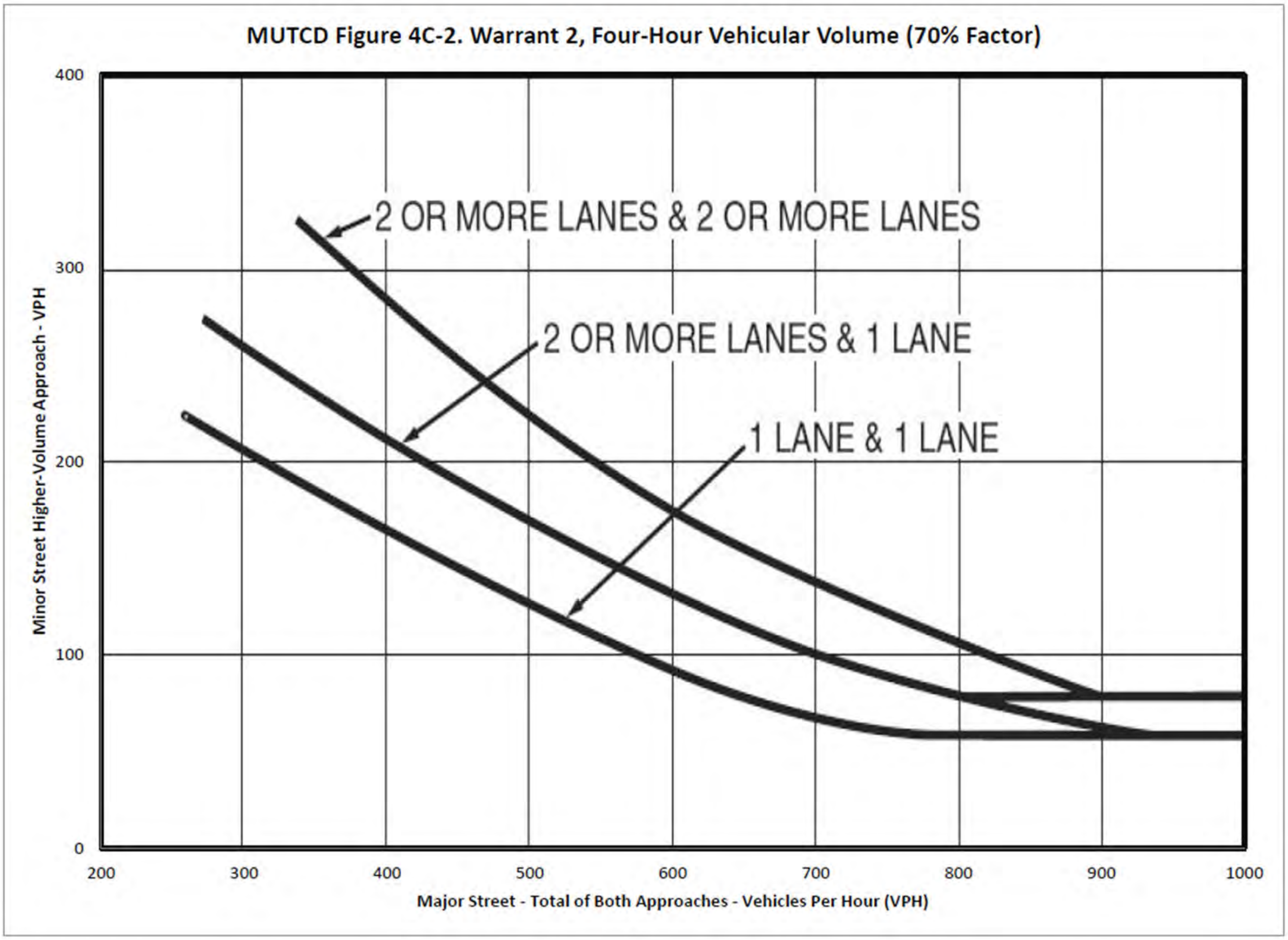
Combination of Condition A and Condition B Satisfied? N/A

MUTCD WARRANT 2, FOUR-HOUR VEHICULAR VOLUME

Number of Lanes for Moving Traffic on Each Approach	
Major Street:	2 or More Lanes
Minor Street:	1 Lane

Total Number of Unique Hours Met On Figure 4C-2
0

Built-up Isolated Community With Less Than 10,000 Population or Above 40 MPH on Major Street?	Yes



Total Major Street Traffic is greater than 1,000 vph.
Side Street Traffic is 11/34 vph in the AM/PM peak hours and are all right turns.

MUTCD WARRANT 3, PEAK HOUR

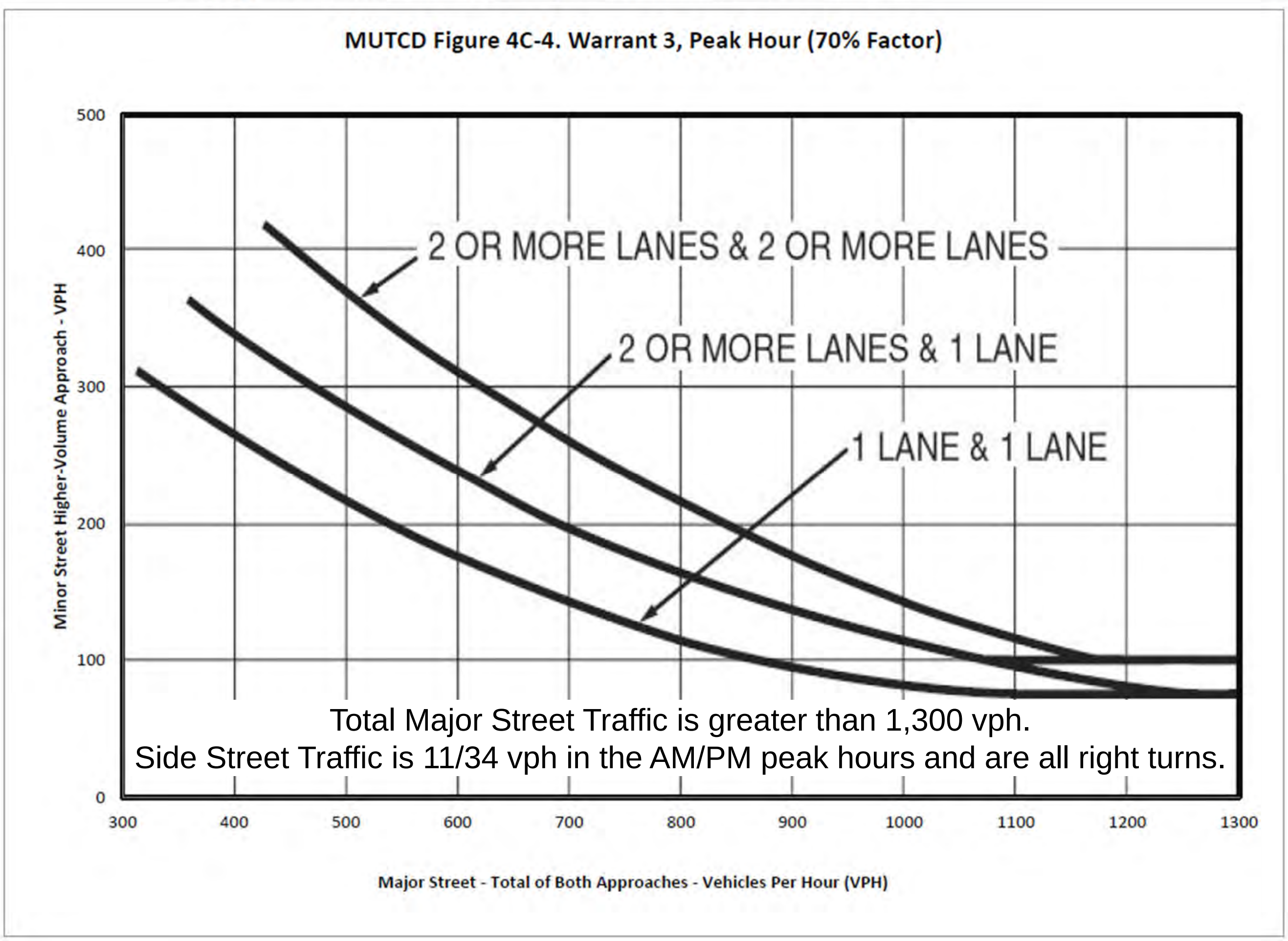
Number of Lanes for Moving Traffic on Each Approach	
Major Street:	2 or More Lanes
Minor Street:	1 Lane

Total Number of Unique Hours Met On Figure 4C-4
0

Built-up Isolated Community With Less Than 10,000 Population or Above 40 MPH on Major Street?	Yes

Is this signal warrant being applied for an unusual case, such as office complexes, manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time?	Yes

Indicate whether all three of the following conditions for the same 1 hour (any four consecutive 15-minute periods) of an average day are present*	
Does the total stopped time delay experienced by the traffic on one minor-street approach (one direction only) controlled by a STOP sign equal or exceed 4 vehicle-hours for a one-lane approach or 5 vehicle-hours for a two-lane approach?	No
Does the volume on the same minor-street approach (one direction only) equal or exceed 100 vehicles per hour for one moving lane of traffic or 150 vehicles per hour for two moving lanes?	Yes in the PM
Does the total entering volume serviced during the hour equal or exceed 650 vehicles per hour for intersection with three approaches or 800 vehicles per hour for intersections with four or more approaches?	Yes
If applicable, attach all supporting calculations and documentation.	



Traffic Signal Warrant Analysis Workbook

6/12/2021

STUDY AND ANALYSIS INFORMATION

Analysis Date:	2021 Cumulative Build
Conducted By:	NV5
Agency/Company Name:	NV5

Is the intersection in a built-up area of an isolated community of <10,000 population? No

Major Street Information

Major Street Name and Route Number:	Indusrial Drive
Major Street Approach #1 Direction:	N-Bound
Major Street Approach #2 Direction:	S-Bound

Number of Lanes for Moving Traffic on Each Major Street Approach: 1 LANE(S)
Speed Limit or 85th Percentile Speed on the Major Street: 35 MPH

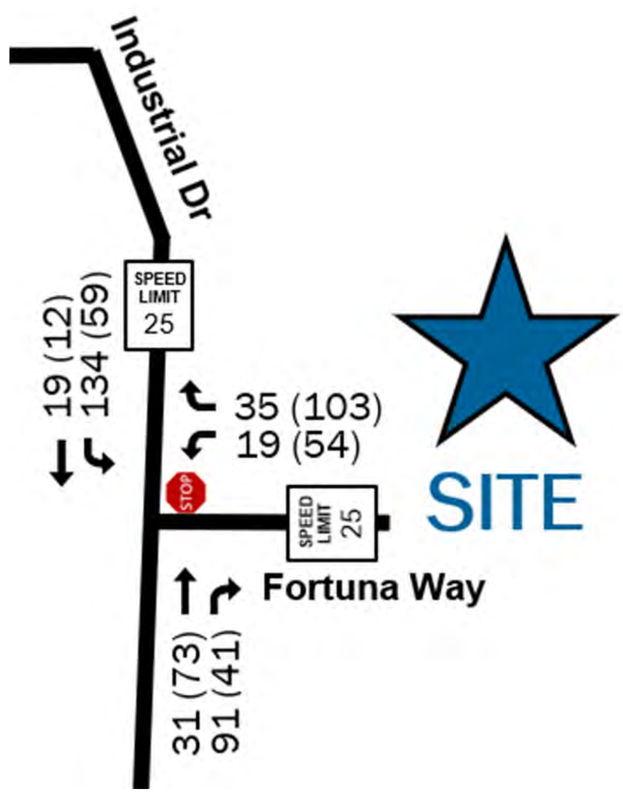
Minor Street Information

Minor Street Name and Route Number:	Fortuna Drive
Minor Street Approach #1 Direction:	W-Bound
Minor Street Approach #2 Direction:	N/A

Number of Lanes for Moving Traffic on Each Minor Street Approach: 1 LANE(S)

TRAFFIC SIGNAL WARRANT ANALYSIS FINDINGS

	Applicable?	Warrant Met?
Warrant 1, Eight-Hour Vehicular Volume	Yes	No
Warrant 2, Four-Hour Vehicular Volume	Yes	No
Warrant 3, Peak Hour	Yes	No



MUTCD WARRANT 1, EIGHT-HOUR VEHICULAR VOLUME

Number of Lanes for Moving Traffic on Each Approach	
Major Street:	1 Lane
Minor Street:	1 Lane

Built-up Isolated Community With Less Than 10,000 Population or Above 40 MPH on Major Street?	No

Combination of Conditions A and B Necessary?*: No

**Only applicable for Warrant 1 if after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems. See Section 4C.02 of the 2009 MUTCD for application.*

Condition A - Minimum Vehicular Volume

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor street approach (one direction only)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1	1	500	400	350	280	150	120	105	84
2 or More	1	600	480	420	336	150	120	105	84
2 or More	2 or More	600	480	420	336	200	160	140	112
1	2 or More	500	400	350	280	200	160	140	112

Condition B - Interruption of Continuous Traffic

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor street approach (one direction only)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1	1	750	600	525	420	75	60	53	42
2 or More	1	900	720	630	504	75	60	53	42
2 or More	2 or More	900	720	630	504	100	80	70	56
1	2 or More	750	600	525	420	100	80	70	56

Condition A Evaluation

Number of Unique Hours Met: 0 **Condition A Satisfied?** No

Condition B Evaluation

Number of Unique Hours Met: 0 **Condition B Satisfied?** No

Combination of Condition A and Condition B Evaluation

Number of Unique Hours Met for Condition A: N/A

Number of Unique Hours Met for Condition B: N/A

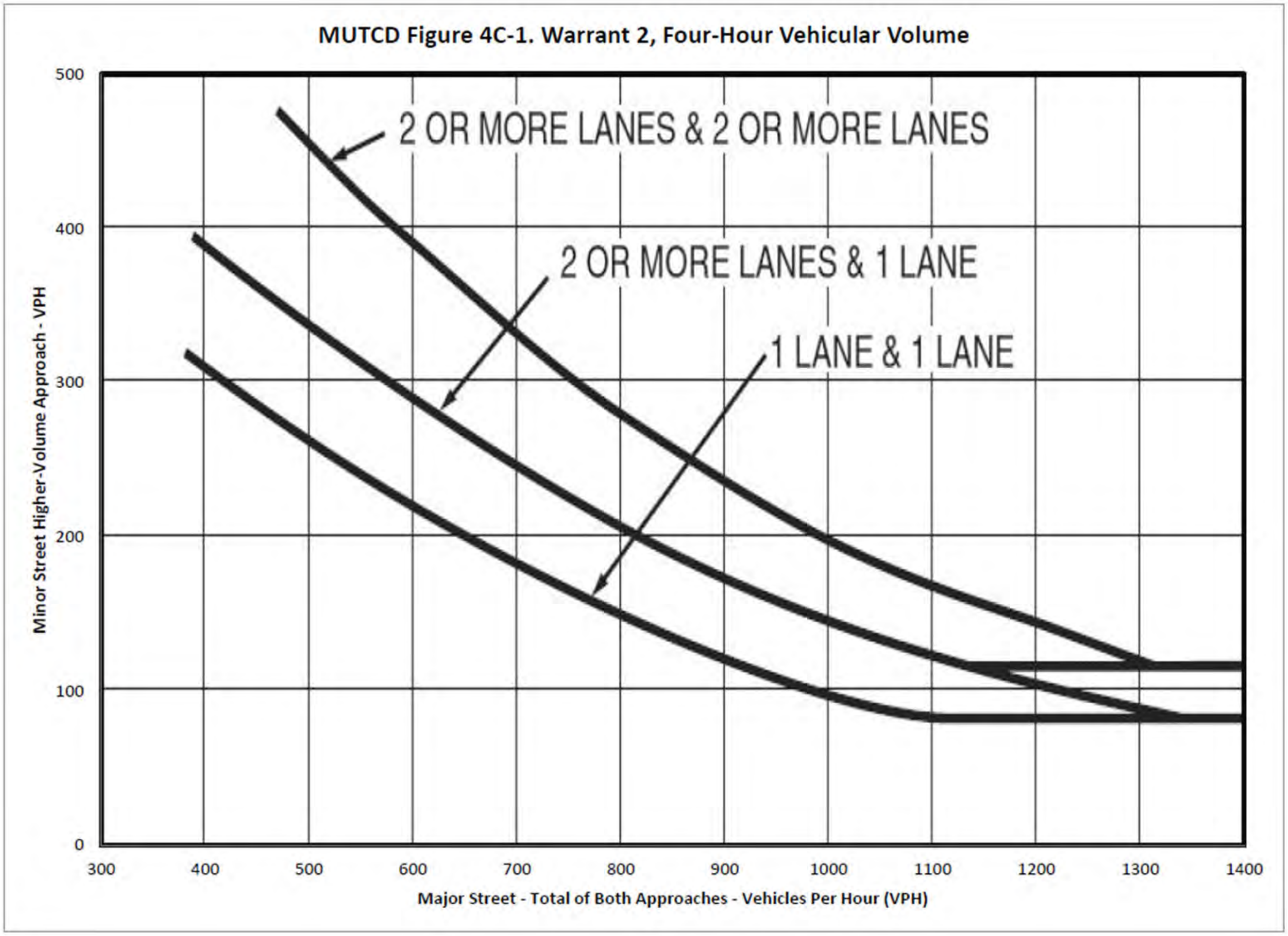
Combination of Condition A and Condition B Satisfied? N/A

MUTCD WARRANT 2, FOUR-HOUR VEHICULAR VOLUME

Number of Lames for Moving Traffic on Each Approach	
Major Street:	1 Lane
Minor Street:	1 Lane

Total Number of Unique Hours Met On Figure 4C-1
0

Built-up Isolated Community With Less Than 10,000 Population or Above 40 MPH on Major Street?	No



Total Major Street Traffic is less than 300 vph

MUTCD WARRANT 3, PEAK HOUR

Number of Lanes for Moving Traffic on Each Approach	
Major Street:	1 Lane
Minor Street:	1 Lane

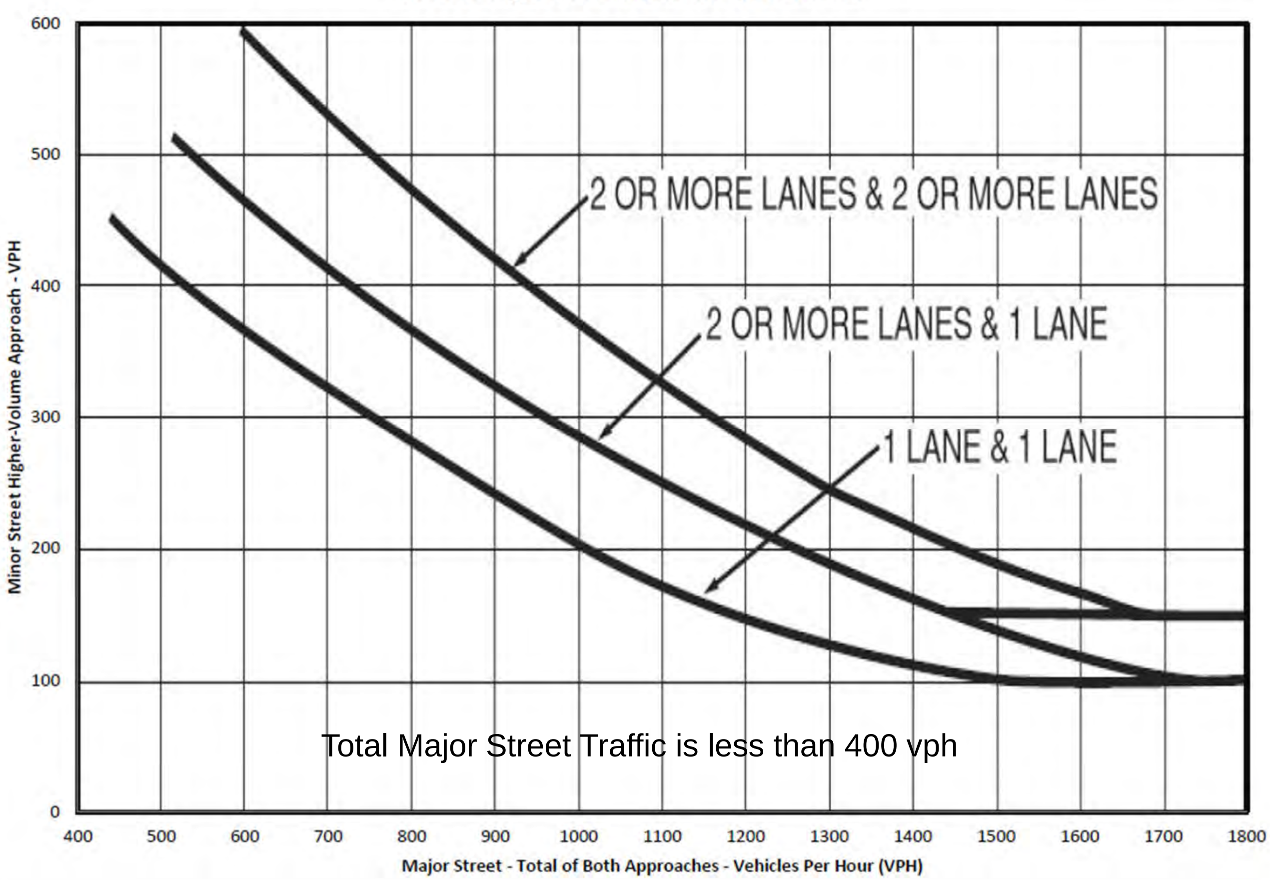
Total Number of Unique Hours Met On Figure 4C-3
0

Built-up Isolated Community With Less Than 10,000 Population or Above 40 MPH on Major Street?	No
Is this signal warrant being applied for an unusual case, such as office complexes, manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time?	Yes

Indicate whether all three of the following conditions for the same 1 hour (any four consecutive 15-minute periods) of an average day are present*	
Does the total stopped time delay experienced by the traffic on one minor-street approach (one direction only) controlled by a STOP sign equal or exceed 4 vehicle-hours for a one-lane approach or 5 vehicle-hours for a two-lane approach?	No
Does the volume on the same minor-street approach (one direction only) equal or exceed 100 vehicles per hour for one moving lane of traffic or 150 vehicles per hour for two moving lanes?	Yes
Does the total entering volume serviced during the hour equal or exceed 650 vehicles per hour for intersection with three approaches or 800 vehicles per hour for intersections with four or more approaches?	No

**If applicable, attach all supporting calculations and documentation.*

MUTCD Figure 4C-3. Warrant 3, Peak Hour



Traffic Signal Warrant Analysis Workbook

6/12/2021

STUDY AND ANALYSIS INFORMATION

Analysis Date:	2021 Cumulative Build
Conducted By:	NV5
Agency/Company Name:	NV5

Is the intersection in a built-up area of an isolated community of <10,000 population? No

Major Street Information

Major Street Name and Route Number:	Industrial Drive
Major Street Approach #1 Direction:	E-Bound
Major Street Approach #2 Direction:	W-Bound

Number of Lanes for Moving Traffic on Each Major Street Approach: 1 LANE(S)
Speed Limit or 85th Percentile Speed on the Major Street: 35 MPH

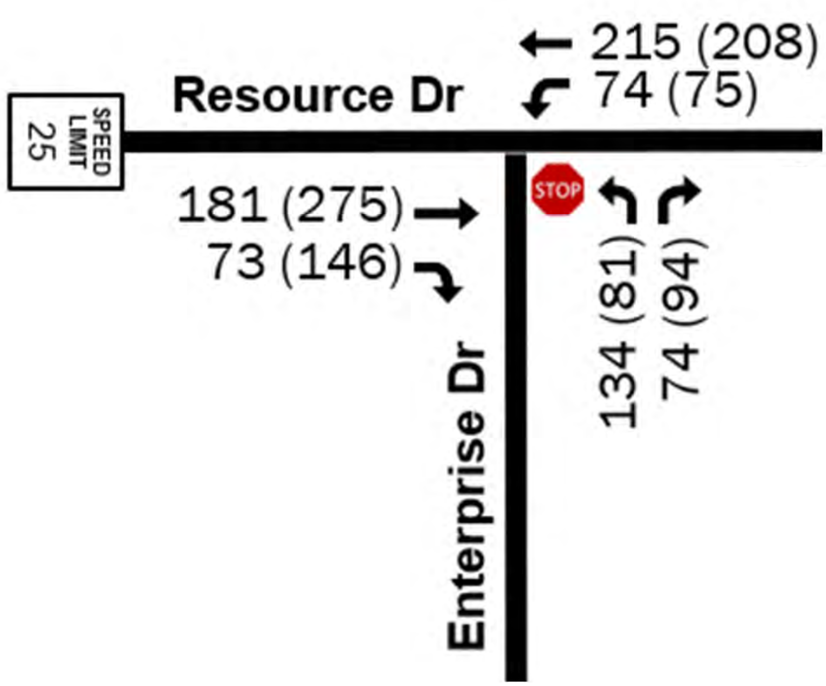
Minor Street Information

Minor Street Name and Route Number:	Resource Drive
Minor Street Approach #1 Direction:	N-Bound
Minor Street Approach #2 Direction:	N/A

Number of Lanes for Moving Traffic on Each Minor Street Approach: 2 LANE(S)

TRAFFIC SIGNAL WARRANT ANALYSIS FINDINGS

	Applicable?	Warrant Met?
Warrant 1, Eight-Hour Vehicular Volume	Yes	No
Warrant 2, Four-Hour Vehicular Volume	Yes	No
Warrant 3, Peak Hour	Yes	No



MUTCD WARRANT 1, EIGHT-HOUR VEHICULAR VOLUME

Number of Lanes for Moving Traffic on Each Approach	
Major Street:	1 Lane
Minor Street:	2 or More Lanes

Built-up Isolated Community With Less Than 10,000 Population or Above 40 MPH on Major Street?	No

Combination of Conditions A and B Necessary?*: No

**Only applicable for Warrant 1 if after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems. See Section 4C.02 of the 2009 MUTCD for application.*

Condition A - Minimum Vehicular Volume

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor street approach (one direction only)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1	1	500	400	350	280	150	120	105	84
2 or More	1	600	480	420	336	150	120	105	84
2 or More	2 or More	600	480	420	336	200	160	140	112
1	2 or More	500	400	350	280	200	160	140	112

Condition B - Interruption of Continuous Traffic

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor street approach (one direction only)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1	1	750	600	525	420	75	60	53	42
2 or More	1	900	720	630	504	75	60	53	42
2 or More	2 or More	900	720	630	504	100	80	70	56
1	2 or More	750	600	525	420	100	80	70	56

Condition A Evaluation

Number of Unique Hours Met: 1

Condition A Satisfied? No

Condition B Evaluation

Number of Unique Hours Met: 0

Condition B Satisfied? No

Combination of Condition A and Condition B Evaluation

Number of Unique Hours Met for Condition A: N/A

Number of Unique Hours Met for Condition B: N/A

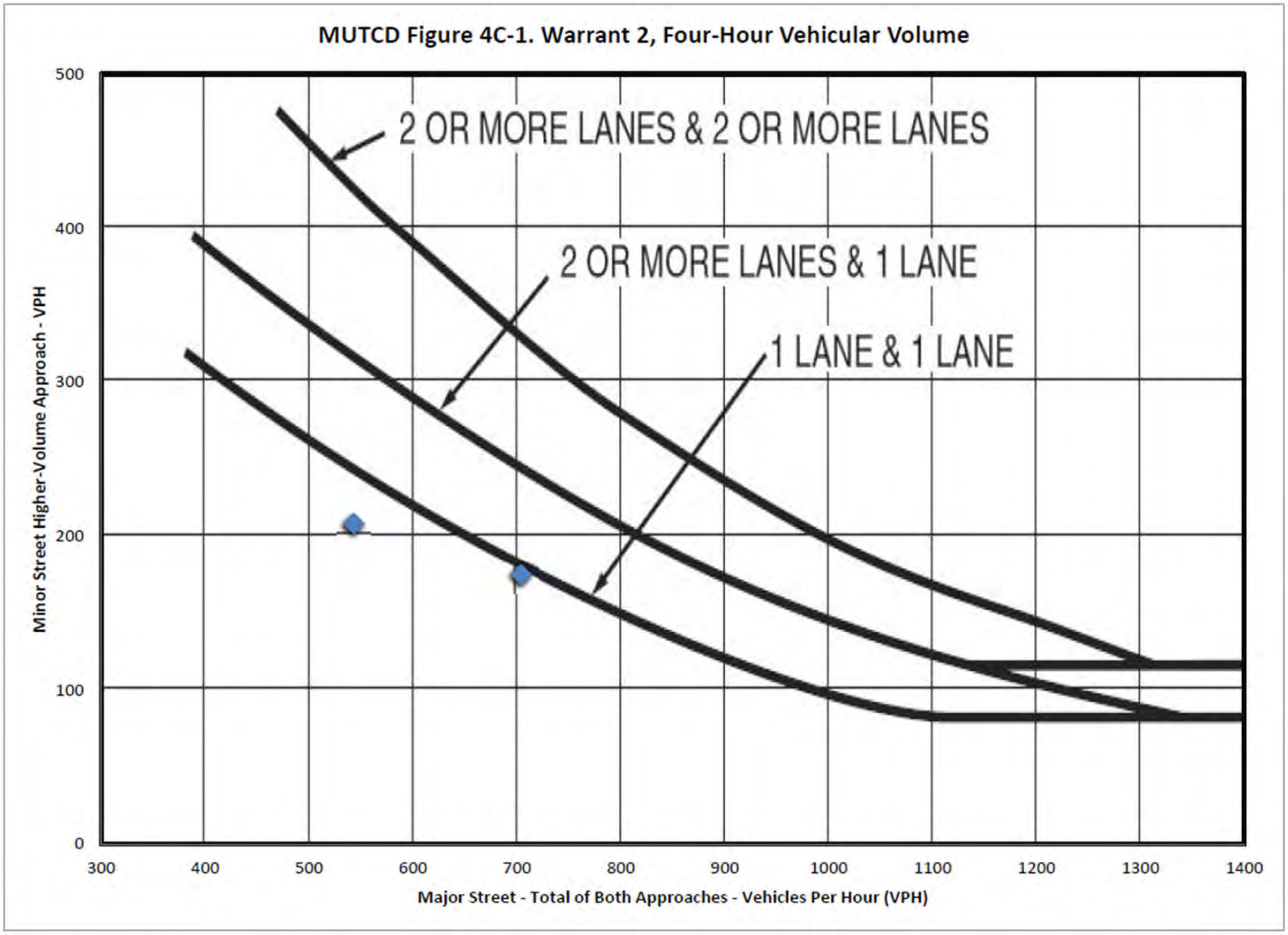
Combination of Condition A and Condition B Satisfied? N/A

MUTCD WARRANT 2, FOUR-HOUR VEHICULAR VOLUME

Number of Lanes for Moving Traffic on Each Approach	
Major Street:	1 Lane
Minor Street:	1 Lane

Total Number of Unique Hours Met On Figure 4C-1
0

Built-up Isolated Community With Less Than 10,000 Population or Above 40 MPH on Major Street?	No



MUTCD WARRANT 3, PEAK HOUR

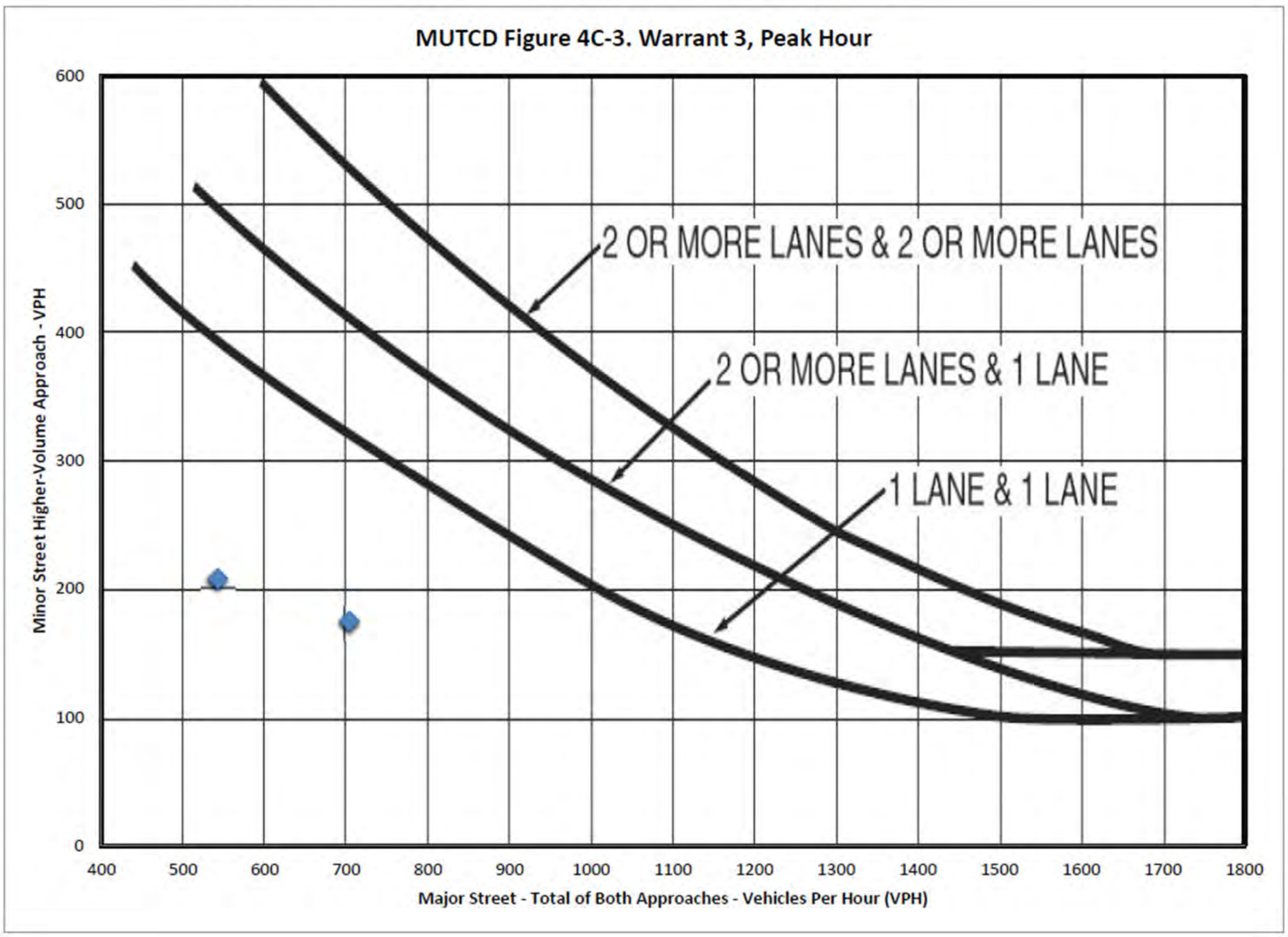
Number of Lanes for Moving Traffic on Each Approach	
Major Street:	1 Lane
Minor Street:	1 Lane

Total Number of Unique Hours Met On Figure 4C-3
0

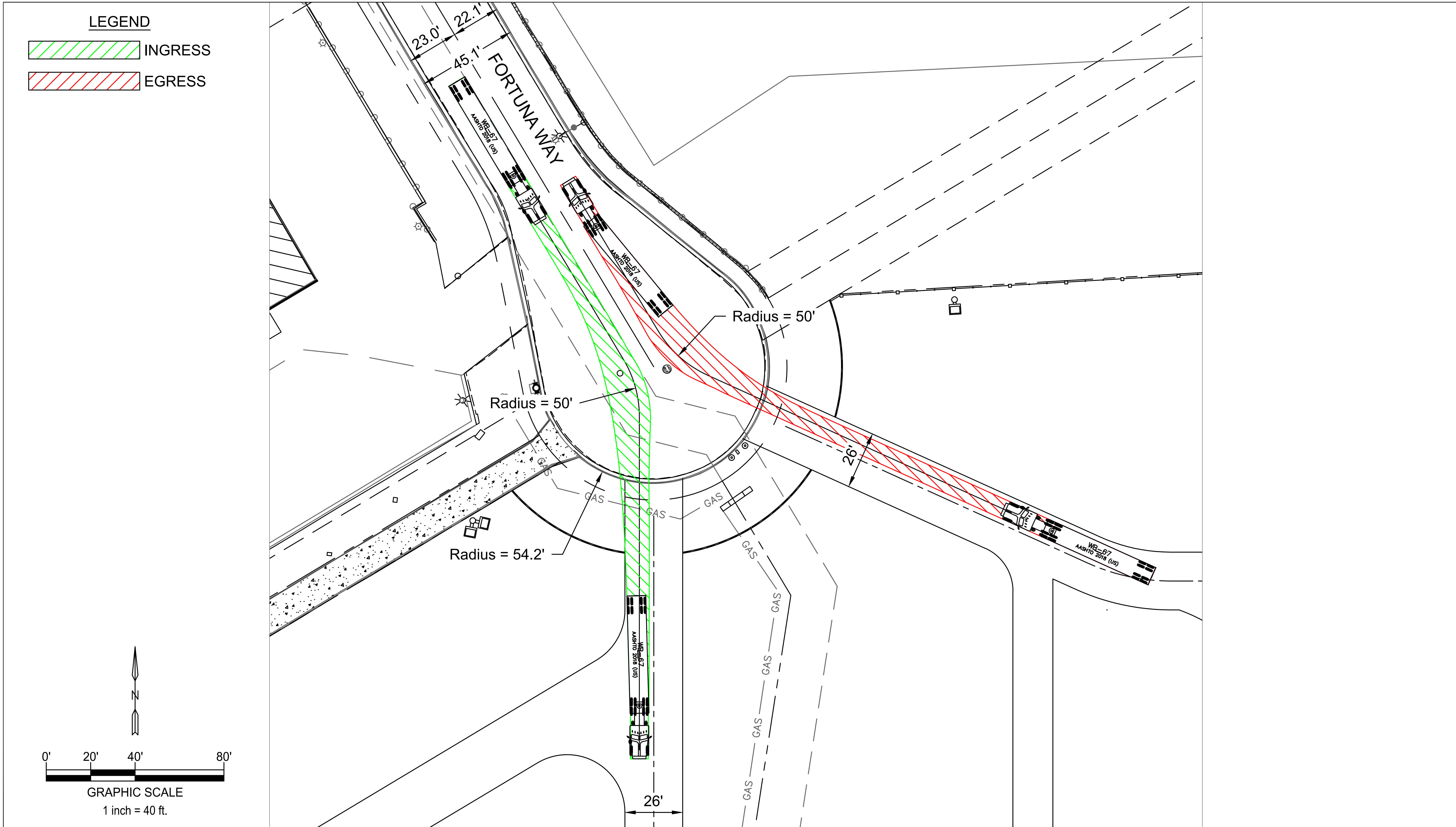
Built-up Isolated Community With Less Than 10,000 Population or Above 40 MPH on Major Street?	No

Is this signal warrant being applied for an unusual case, such as office complexes, manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time?	Yes

Indicate whether all three of the following conditions for the same 1 hour (any four consecutive 15-minute periods) of an average day are present*	
Does the total stopped time delay experienced by the traffic on one minor-street approach (one direction only) controlled by a STOP sign equal or exceed 4 vehicle-hours for a one-lane approach or 5 vehicle-hours for a two-lane approach?	No
Does the volume on the same minor-street approach (one direction only) equal or exceed 100 vehicles per hour for one moving lane of traffic or 150 vehicles per hour for two moving lanes?	Yes
Does the total entering volume serviced during the hour equal or exceed 650 vehicles per hour for intersection with three approaches or 800 vehicles per hour for intersections with four or more approaches?	No
If applicable, attach all supporting calculations and documentation.	



Appendix I – Truck Turning Template



DATE: 08/02/2021

DRAWN BY: AK

CHECKED BY: VG

NV5
1255 CANTON ST, SUITE G
ROSWELL, GA 30075
(678) 795-3600
WWW.NV5.COM

REVISION DATES

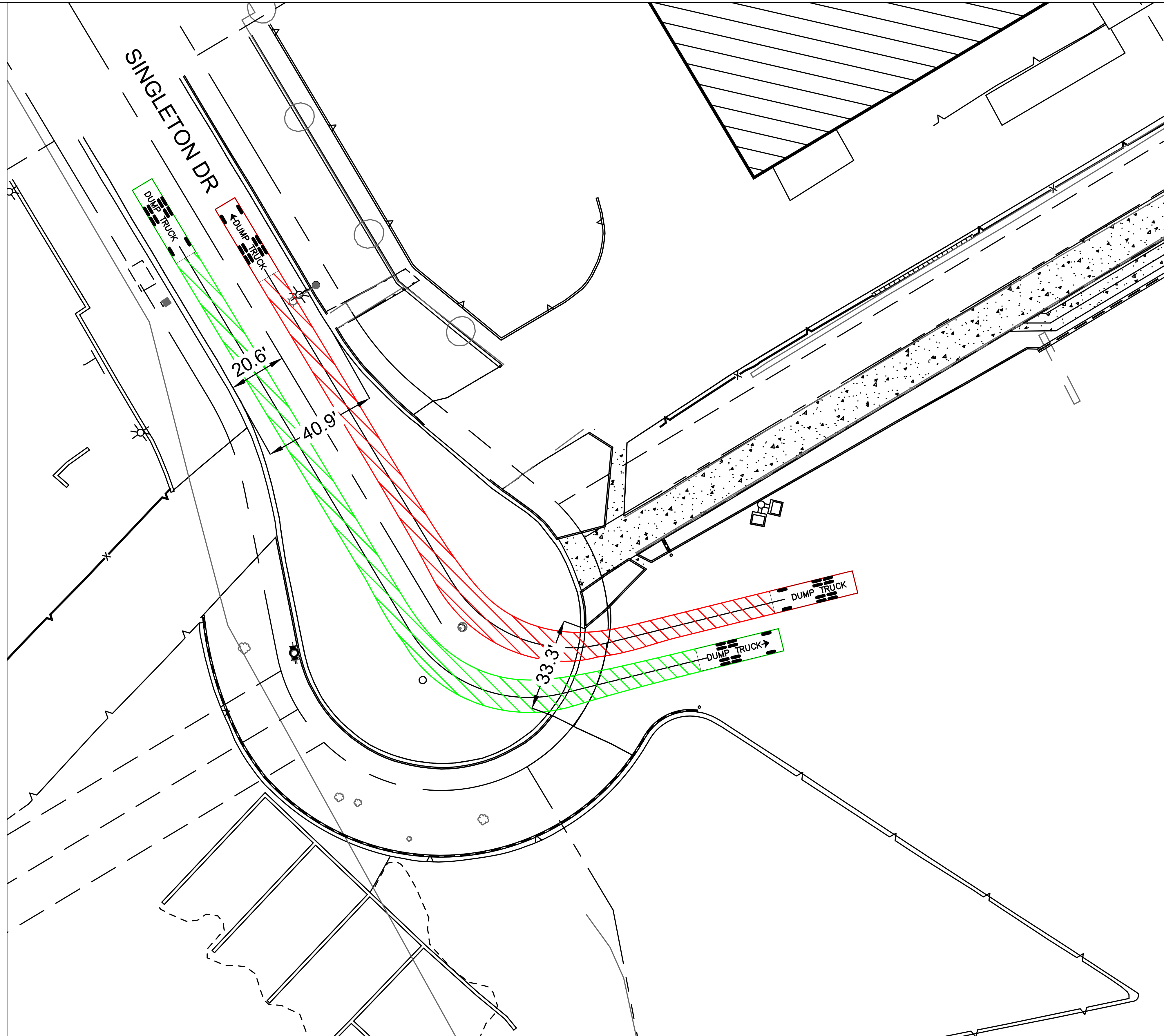
TRUCK TURNING EXHIBIT
FORTUNA WAY DRIVEWAYS

PROJECT NO. 2020086.00

LEGEND

INGRESS

EGRESS



0' 20' 40' 80'

GRAPHIC SCALE

1 inch = 40 ft.

DATE: 08/02/2021

DRAWN BY: AK

CHECKED BY: VG

NV5

1255 CANTON ST, SUITE G
ROSWELL, GA 30075
(678) 795-3600
WWW.NV5.COM

REVISION DATES

TRUCK TURNING EXHIBIT SINGLETON DR CONSTRUCTION ENTRANCE

PROJECT NO. 2020086.00

Appendix J – Cost Estimates

CITY OF RIALTO
Riverside Avenue/Slover Avenue
Preliminary Opinion on Probable Project Cost

PSOMAS

Preparer(s): Karen Nguyen
Reviewer: Arief Naftali
Date Updated: 11/18/16

DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	EXTENDED AMOUNT	ASSUMPTIONS
Miscellaneous					
Mobilization/Demobilization (Not to Exceed 5% of Subtotal)	1	LS	$ 20,000.00	$ 20,000	
Construction Survey	1	LS	$ 10,000.00	$ 10,000	
Construction Management & Inspection	1	LS	$ 40,000.00	$ 40,000	Performed by Psomas
Construction Administration	1	LS	$ 20,000.00	$ 20,000	Performed by Psomas
Stormwater Control/BMPs/SWPPP	1	LS	$ 5,000.00	$ 5,000	
Clearing and Grubbing	1	LS	$ 3,500.00	$ 3,500	Per Greenbook
Traffic Control (Including Construction Signs and CMS)	1	LS	$ 15,000.00	$ 15,000	
			Miscellaneous Subtotal	**$ 113,500**	
Intersection					
Construct Type 8 Integral Curb and Gutter	190	LF	$ 19.00	$ 3,610	
Construct 4" PCC Sidewalk	1,900	SF	$ 5.95	$ 11,305	10' Sidewalk
Construct Curb Ramps	4	EA	$ 2,390.00	$ 9,560	
Traffic Signal Relocation Per Pole, 1A (10') Pole	4	EA	$ 6,550.00	$ 26,200	
Traffic Signal Relocation Per Pole, Pole With Mastarm	4	EA	$ 13,100.00	$ 52,400	
Relocate PB or Adj. Grade	8	EA	$ 120.00	$ 960	
Traffic Signal Loops	32	EA	$ 450.00	$ 14,400	
			Intersection Construction Subtotal =	**$ 118,435**	
Utility Improvements					
Construct Catch Basin - 7'	1	EA	$ 6,240.00	$ 6,240	
Construct Catch Basin - 14'	1	EA	$ 11,350.00	$ 11,350	
Construct Junction Structure	0	EA	$ 2,837.00	$ -	
Construct Local Depression	0	EA	$ 1,192.00	$ -	
Adjust Sewer Manhole to Grade	2	EA	$ 800.00	$ 1,600	
Adjust Unknown Manhole to Grade	2	EA	$ 800.00	$ 1,600	
Adjust Water Valve to Grade	3	EA	$ 500.00	$ 1,500	
Relocate Power Pole	1	EA		$ -	SCE will handle relocation cost
Relocate Street Light	0	EA	$ 6,810.00	$ -	
Relocate Fire Hydrant	1	EA	$ 3,000.00	$ 3,000	
Relocate Vent	0	EA	$ 10,000.00	$ -	
Relocate Vault	0	EA	$ 5,000.00	$ -	
Relocate Cabinent	0	EA	$ 5,000.00	$ -	
			Utility Improvements Subtotal =	**$ 25,290**	
Landscaping and Irrigation Improvements					
Median Landscaping	0	LS	$ -	$ -	
Median Irrigation	0	LS	$ -	$ -	
Water and Electrical POC's	0	LS	$ -	$ -	
Tree Removal	0	EA	$ -	$ -	
			Landscaping and Irrigation Improvements Subtotal =	**$ -**	
Signing and Striping Improvement					
Signing and Striping	1	LS	$ 310.00	$ 310	
			Subtotal =	$ 257,535	
			Contingency (15%) =	$ 38,600	
			CONSTRUCTION TOTAL =	**$296,000**	
			DESIGN TOTAL (20% of Construction Costs) =	**$59,200**	
			GRAND TOTAL	**$355,200**	

CITY OF RIALTO
Riverside between I-10 and Agua Mansa (2 mi)
Preliminary Opinion on Probable Project Cost

PSOMAS

Preparer(s): Lisette Bice
Reviewer: Arief Naftali

Date Updated: 08/09/16

DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	EXTENDED AMOUNT	ASSUMPTIONS
Miscellaneous					
Mobilization/Demobilization (Not to Exceed 5% of Subtotal)	1	LS	$ 800,000.00	$800,000	
Construction Survey	1	LS	$ 150,000.00	$150,000	
Construction Management & Inspection	1	LS	$ 3,000,000.00	$3,000,000	Performed by Psomas
Stormwater Control/BMPs/SWPPP	1	LS	$ 7,000.00	$7,000	
Clearing and Grubbing	1	LS	$ 500,000.00	$500,000	Per Greenbook
Traffic Control (Including Construction Signs and CMS)	1	LS	$ 90,000.00	$90,000	
Right-of-Way Acquisition	140,643	SF	$ 15.00	$2,109,645	
			Miscellaneous Subtotal =	**$6,700,845**	
Road Construction					
Construct Type 8 Integral Curb and Gutter	22,000	LF	$ 19.00	$ 418,000	
Construct 4" PCC Sidewalk	253,440	SF	$ 5.95	$ 1,507,968	
Construct 8" Median Curb	21,500	LF	$ 15.00	$ 322,500	
Construct PCC Paving in Medians	16,000	SF	$ 5.95	$ 95,200	Assume 18" band
Construct Curb Ramps	21	EA	$ 2,390.00	$ 50,190	
Subgrade Preparation	225,500	SF	$ 0.36	$ 81,180	Top 6" of Soil
1-1/2" Cold Mill ($35,000 + $0.80/SF)	789,000	SF	$ 0.80	$ 631,200	
Construct 1-1/2" Overlay Asphalt Pavement	789,000	SF	$ 0.90	$ 710,100	
Construct 5" Asphalt Pavement/Aggregrate Base (5"/6")	225,500	SF	$ 4.00	$ 902,000	Full Depth
Construct Commercial Driveway	17,000	SF	$ 10.75	$ 182,750	
Construct Residential Driveway	0	SF	$ 10.75	$ -	
Construct Cross Gutter	1	EA	$ 5,000.00	$ 5,000	
Construct Parkway Culvert	3	EA	$ 1,500.00	$ 4,500	
construct Retaining Wall	575	LF	$ 100.00	$ 57,500	
Wide Overpass	15,000	SF	$ 1,000.00	$ 15,000,000	
			Road Construction Subtotal =	**$ 19,968,088**	
Utility Improvements					
Adjust Sewer Manhole to Grade	0	EA	$ 800.00	$0	
Adjust Unknown Manhole to Grade	0	EA	$ 800.00	$0	
Adjust Vault to Grade	0	EA	$ 3,000.00	$0	
Adjust Water Valve to Grade	3	EA	$ 500.00	$1,500	
Relocate Manhole	0	EA	$ 5,000.00	$0	
Relocate Power Pole	52	EA	$ -	$0	SCE will cover the cost of the relocation
Relocate Guy Wire	19	EA	$ 15,000.00	$285,000	
Relocate Water Meter	19	EA	$ 500.00	$9,500	
Relocate Street Light	21	EA	$ 6,810.00	$143,010	
Relocate Fire Hydrant	32	EA	$ 3,000.00	$96,000	
Relocate Vent	0	EA	$ 10,000.00	$0	
Relocate Vault	0	EA	$ 5,000.00	$0	
Relocate Cabinent	0	EA	$ 5,000.00	$0	
Relocate Mailbox	3	EA	$ 300.00	$900	
Relocate Pull Box	21	EA	$ 700.00	$14,700	
Construct Catch Basin - 7'	0	EA	$ 6,240.00	$0	
Construct Catch Basin - 14'	11	EA	$ 11,350.00	$124,850	
Construct Local Depression	11	EA	$ 1,192.00	$13,112	
Construct Concrete Collar	11	EA	$ 2,980.00	$32,780	
Construct 18" RCP	165	LF	$ 113.50	$18,728	
			Utility Subtotal =	**$740,080**	
Rail Improvements					
Relocate Rail Signals	0	EA	$ 250,000.00	$ -	
Relocate Rail Bungalow	0	EA	$ 50,000.00	$ -	
			Rail Subtotal =	**$0**	
Landscaping and Irrigation Improvements					
Median Landscaping	10,560	LF	$ 100.00	$ 1,056,000	No Street Trees or Parkway Landscaping
Median Irrigation	10,560	LF	$ 75.00	$ 792,000	Mainline, conduit, POV
			Landscaping Subtotal =	**$1,848,000**	
Signing and Striping Improvement					
Signing and Striping	1	LS	$ 40,000.00	$ 40,000	
			Signing and Striping Subtotal =	**$40,000**	
			Subtotal =	$29,297,013	
			Contingency (15%) =	$4,394,600	
			CONSTRUCTION TOTAL =	**$33,691,600**	
			DESIGN TOTAL (20% of Construction Costs) =	**$6,738,320**	
			GRAND TOTAL =	**$40,429,920**	

MEMORANDUM

Date: September 6, 2021

Ref: Vehicle Miles Traveled (VMT) Study
Angelus Block Co. Manufacturing Plant (MC2020-0012)
Fortuna Avenue
Rialto, CA 92010

This memo summarizes the findings and recommendations of the Vehicle Miles Traveled (VMT) analysis for the proposed Angelus Block manufacturing facility in the City of Rialto, CA. The VMT analysis results are presented below.

Background

With the adoption of Senate Bill (SB) 743, the State of California changed the method of traffic analysis required through the California Environmental Quality Act (CEQA) for publicly and privately initiated projects. The law changed the way local jurisdictions, like the County of San Bernadino, analyze transportation impacts from development projects and identify mitigation measures to reduce those impacts. SB 743 became effective on July 1, 2020. The County of San Bernadino uses VMT as the new analysis metric.

Project Description

The project is a proposed manufacturing plant consisting of 188,493 square feet. Access to the site is provided via a cul-de-sac at the end of Fortuna Way. There are two one-way driveways spaced out within this cul-de-sac: one for entering and one for exiting. A secondary entrance is located at the end of Singleton Drive at the southern portion of the proposed site. This entrance is dedicated to construction vehicles and will not be used for daily operations once construction of the site is complete.

General Plan Consistency

The site is located within the Agua Mansa Specific Plan and is consistent with the City's General Plan. The industrial corridor is 4,285 acres, located south of I-10 and west of I-215 on the western bank of the Santa Ana River. The corridor is approved for a variety of land uses, including industrial, agricultural, and residential.

According to the City of Rialto's General Plan (2010), Policy 2-9.3: Focus the establishment of new industries using, manufacturing, transporting, or storing hazardous or toxic materials or wastes within the Agua Mansa Industrial Corridor Area. For the corridor the General Plan the objectives for the Agua Mansa Project Area include maintaining and enhancing opportunities for industrial activity, employment creation, and infrastructure improvements.

County VMT Guidelines

The City of Rialto's VMT Analysis Guidelines are currently in development, therefore, the County of San Bernadino's Transportation Impact Study Guidelines (2019) were used. The guidelines require a VMT analysis be conducted if a project generates over 110 trips per day. Trips generated by the project's proposed land uses have been estimated based on trip generation rates collected by the Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition. The resulting trip generation for the proposed project is presented in the traffic impact study (TIS) dated September 2021. According to the 2021 TIS, the project is anticipated to generate 1,270 passenger car equivalent daily trips per day. Based on the County's 110 daily trip threshold, the project is required to evaluate VMT per employee to determine the project's impact to VMT.

VMT Screening Evaluation

The County guidelines permit the use of the San Bernardino Transportation Analysis Model (SBTAM) most recent interactive VMT map[1] to estimate VMT for the traffic analysis zone (TAZ) in which the proposed project is located. Industrial projects are evaluated based on VMT/employee and are considered to have significant impacts when the VMT/employee for the project exceeds the regional average VMT/employee. Table 1 includes the regional mean VMT per employee and the VMT per Employee for the project's TAZ in which the proposed manufacturing facility would be located. Images of the interactive map results are attached for reference.

Table 1. VMT Comparison

VMT/Employee	
County of San Bernadino VMT	27.2
Project TAZ VMT	107.8

Based on the screening map, employee based VMT for the project is higher than the regional average. To determine the project's significance, a model run was required and performed using the most recent version of the SBTAM.

VMT Model Results

The San Bernardino Transportation Analysis Model (SBTAM) baseline model year output files were used to calculate the VMT metrics for the Project TAZ and the San Bernardino County region. The VMT calculation methodology outlined below has been developed based on VMT calculation methodologies utilized by other jurisdictions in Riverside County and the surrounding region.

As part of the impact analysis under CEQA, both project impacts and cumulative impacts must be evaluated to determine the project's impact on the environment. Therefore, VMT analyses were conducted for the project buildout year (2022) and for the SBTAM horizon model year (2040) to determine buildout year and cumulative impacts. The VMT were analyzed for the following traffic conditions:

- Baseline (2022) Without Project;
- Baseline (2022) With Project;
- Cumulative (2040) Without Project; and
- Cumulative (2040) With Project conditions.

VMT results for each condition are identified in Table 2.

Table 2. VMT Model Results

VMT/Employee	Baseline 2022 Conditions		Change	Cumulative 2040 Conditions		Change
	Without Project	With Project		Without Project	With Project	
County of San Bernadino	18.98	21.18	2.20	24.69	20.71	-3.98
Project TAZ	23.04	24.17	1.13	26.91	22.04	-4.87

[1] https://sbcta.maps.arcgis.com/apps/webappviewer/index.html?id=779a71bc659041ad995cd48d9ef4052b last consulted 06/13/2021.

Using the County of San Bernadino for comparison, the project is anticipated to have a significant impact on VMT under Baseline 2022 Conditions as identified in Table 2. In the Cumulative 2040 Condition, the project will not have a significant impact on VMT and will reduce the Cumulative VMT by 3.98. Specific model information and input criteria is provided in the Attachments.

VMT Reduction Strategies

According to the County of San Bernadino's Traffic Study Guidelines (2019), a project that has a higher VMT per person/employee than the regional average should be mitigated to 4% below the baseline VMT. The project therefore is required to reduce the project VMT to 4% below the Baseline 2022 Condition for a resulting VMT of 18.22. No mitigation is required for the 2040 Cumulative Condition.

Based on the County guidelines, projects that are over the VMT threshold should consist of Transportation Demand Management (TDM) measures analyzed under a VMT-reduction methodology consistent with Chapter 7 of the California Air Pollution Control Officers Association (CAPCOA) Quantifying Greenhouse Gas Mitigation Measures (August 2010). The following TDM measures will be implemented with the project and are feasible based on the project site land use and operation.

- **Commute Trip Reduction**
  - Applying TRT-1 from CAPCOA: Implement Commute Trip Reduction Marketing
    This includes existing and new employee orientation of trip reduction and alternative mode options and disbursement of alternative mode choice marketing materials and resources (100% of employees eligible). Additionally, the project will provide a Transportation Coordinator to distribute TDM information to existing employees and new hires, and provide priority parking for vanpool/carpool participants.
- **Ride Share Program**
  Participation in the County of San Bernadino's Carpool and Vanpool Ride-Matching Services and encouragement for employees to participate in the program.

- **Preferential Parking Permit Program**
  The project will provide preferential parking spaces to carpool and vanpool participants, this measure compliments TRT-1 and TRT-3 therefore no reduction was applied to avoid double counting.

Additional VMT reduction strategies the project is committed to include a 25% **Local Hiring Commitment.** The Local Hiring Commitment guarantees at least 25% of employees will be located within the City of Rialto and adjacent cities, creating more internalized trips, and supporting the goals of SB 743. Based on sociodemographic data within the City's boundaries, the average distance of travel to the site is 11.93 miles. The local hiring commitment would include any jurisdiction within that limit. Based on the average VMT per employee, creating employment opportunities in the City is an effective VMT reducing measure bringing the average VMT to 18.87 miles with a 25% local hiring commitment. The VMT per employee therefore would be below the Baseline 2022 without Project condition. Employment data is provided in the Attachments.

Using the methodology provided by CAPCOA and the local hiring commitment, the VMT reduction for the project is identified in Table 3.

	Reduction Strategy	Range of Effectiveness	VMT Reduction	Combined VMT Reduction	Results
Commute Trip Reduction (CAPCOA)					
TRT-1	Implement Commute Trip Reduction Marketing	0.8 - 6.2%	4.16%	8.8%	-1.86
TRT-3	Provide Ride Sharing Program	1-15%	5.0%	8.8%	
TRT-8	Preferential Parking Permit Program	N/A	N/A	8.8%	
Baseline 2022 Conditions w/ Project					21.18
Baseline 2022 Conditions w/ Project (CAPCOA Reduction)					19.32
Local Hiring Reduction (25%)					2.32
Baseline 2022 Conditions w/ Project (Local Hiring and CAPCOA Strategies)					17.0

Notes:

1. VMT Reduction results based on methodology from Quantifying Greenhouse Gas Mitigation Measures (CAPCOA, 2010).
2. TRT-series measures apply to commute VMT, which is estimated at 100 percent of the overall Project Employee VMT.
3. TRT-1 includes TDM coordinator, carpool encouragement, vanpool assistance, and ride matching assistance. Alternative literature was referenced for applicability purposes.TRT-8 strategy is a complement to TRT-1.
4. TRT-3 Ride share program 100% of employees are eligible for the rideshare program participation.
5. The project's total VMT Reduction based on CAPCOA is 8.8% (1.86).
   Each VMT reduction measure's percent reduction is combined multiplicatively to get the project's total VMT Reduction. As discussed in Chapter 6 of the CAPCOA report, the equation is as follows: Combined CAPCOATotal Reduction = 1 - [(1-A) x (1-B) x (1-C) x …]; A,B,C, = each measure's percent reduction
6. Local hiring commitment assumes at least 25% of employees will be local hires. With 25% local hires the new VMT average is 18.87. See attachments for eligible employees and distance traveled to the project site.

Results

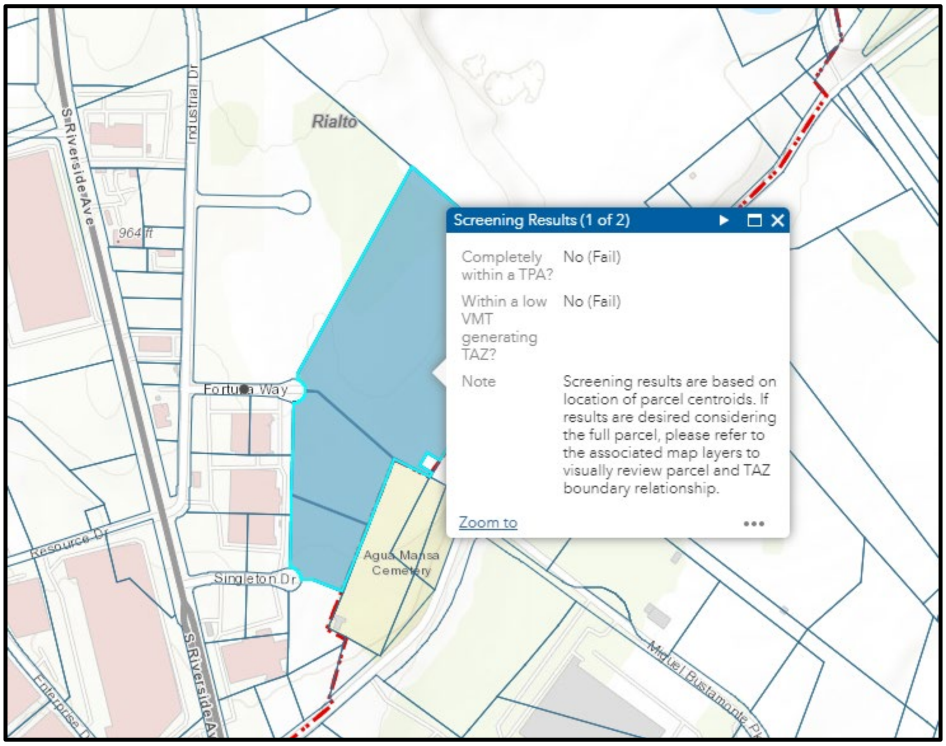
With CAPCOA strategies and the Local Hiring Commitment, the project is anticipated to reduce VMT at least 4% below the baseline VMT. With the implementation of the strategies identified in this memorandum, the project will result in a total VMT per employee of 17.0 in the Baseline 2022 Condition. The project does not result in a significant impact and reduces VMT in the Cumulative 2040 Condition. No additional VMT reduction strategies are required.

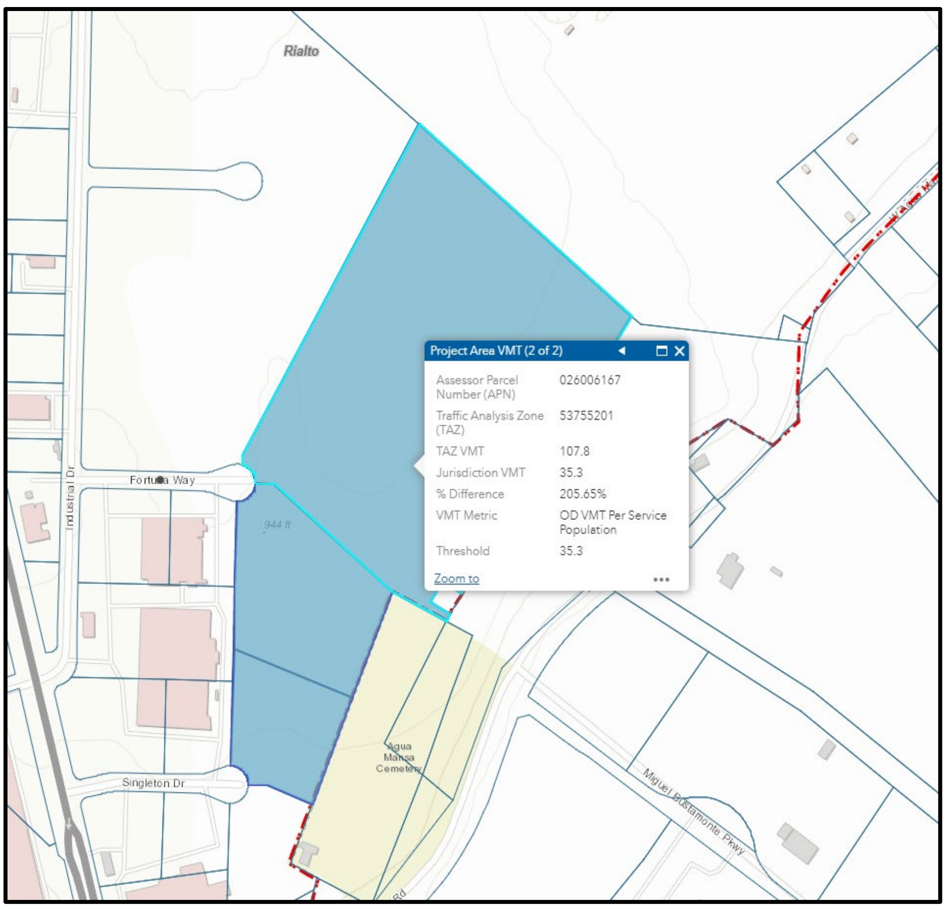
Attachments

VMT Screening Map Results
Model Run Methodology
Model Run Results
City Employee VMT Results

Attachments

VMT Screening Map Results





300 Corporate Pointe, Suite 470, Culver City, CA 90230
T: (310) 473-6508 | www.koacorp.com
MONTEREY PARK ORANGE ONTARIO SAN DIEGO LA QUINTA CULVER CITY

VMT CALCULATION METHODOLOGY

The San Bernardino Transportation Analysis Model (SBTAM) baseline model year output files were used to calculate the VMT metrics for the Project TAZ, the City of Rialto, and the San Bernardino County region. The VMT calculation methodology outlined below has been developed based on VMT calculation methodologies utilized by other jurisdictions in Riverside County and the surrounding region.

As part of the impact analysis under CEQA, both Project impacts and cumulative impacts must be evaluated to determine the Project's impact on the environment. Therefore, VMT analyses were conducted for the Project buildout year (2022) to evaluate Project impacts and for the SBTAM horizon model year (2040) to determine cumulative impacts. The VMT were analyzed for the following traffic conditions:

- Baseline (2022) Without Project conditions;
- Baseline (2022) With Project conditions;
- Cumulative (2040) Without Project conditions; and
- Cumulative (2040) With Project conditions.

As the Project buildout year does not coincide with the SBTAM base year (2016) or future year (2040), VMT results were interpolated between these two conditions to estimate VMT results during the Project's buildout year (2022).

The model output files for the SBTAM without adjustments to the model assumptions were used to determine the VMT metrics for the Without Project scenario. VMT results for the With Project conditions were determined by running the SBTAM with adjusted socioeconomic data (SED) inputs to account for the land use changes resulting from Project development. These changes in SED reflected Project-related employment increases for the Project TAZ under With Project conditions. The adjustments to the SED assumptions are detailed in the following section.

Once the adjustments were made to the SED, the SBTAM was run for the base year (2016) and future year (2040), each for the With Project conditions. The output files from these model runs were assessed to determine the VMT metrics for the Project TAZ, the City of Rialto overall, and the entire San Bernardino County region. The home-based work VMT was calculated using the production-attraction (PA) methodology, which allows for the calculation of VMT for specific trip types. This methodology consists of converting the peak (PK) and off-peak (OP) PA matrices from person trips to vehicles trips using average vehicle occupancy rates. This process replicated the model process of converting PA matrices to origin-destination (OD) matrices, however it was conducted only for the home-based work trip type while keeping departure and return trips distinct. The PK and OP skim matrices were then multiplied by the custom-calculated home-based work vehicle trip matrices to estimate VMT. The VMT matrices were then summed to combine PK and OP VMT estimates for departure and return trips. The total daily home-based work VMT was then extracted using the marginal totals from the daily departure and return VMT matrices (column of departure matrix and row of return matrix) for the individual Project TAZ, the City of Rialto TAZs, and the San Bernardino County TAZs. These totals were then divided by the total employment of the Project TAZ, the Rialto TAZs, and the San Bernardino County TAZs, respectively, to determine the home-based work VMT per employee for the corresponding geographical region.

SBTAM SOCIOECONOMIC DATA ASSUMPTIONS

VMT results for the With Project conditions were determined by running the SBTAM with appropriate SED inputs to account for the land use changes resulting from Project development. In order to ensure that the SBTAM accounts for proposed levels of development on the Project site, the SED input data for the model base (2016) and future (2040) years were reviewed. Adjustments were made to the SED assumptions for both model years under to account for employment growth under With Project conditions.

SBTAM BASE YEAR (2012) SOCIOECONOMIC DATA ADJUSTMENTS

For the With Project scenario, Project-related employment increases were added to the SED assumptions from the base year (2012) Without Project conditions. Since the Project consists of the development of a paving stone/brick manufacturing facility, the additional employees were categorized within the manufacturing employment type.

SBTAM FUTURE YEAR (2040) SOCIOECONOMIC DATA ADJUSTMENTS

The SED assumptions for the SBTAM future year (2040) were also adjusted to account for employment growth assumptions for the Project TAZ. For the future year (2040) Plus Project conditions, the Project-added employment estimates were then added to the SED assumptions for the future year (2040) Without Project conditions. All additional employment added to the Project TAZ was categorized by manufacturing employment type. Additionally, employment estimates added to the Project TAZ were also proportionately removed from surrounding non-Project TAZs to maintain a constant level of regional growth for the SBTAM future year. Maintaining a constant level of employment growth in the region ensures consistency with the Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS). Therefore, SED assumptions for TAZs within an approximately 5-mile radius of the Project site was reviewed to identify the TAZs with the most manufacturing jobs.

Model Run Results

Angeles Block Company
VMT Analysis
Project TAZ Socioeconomic Data Adjustments

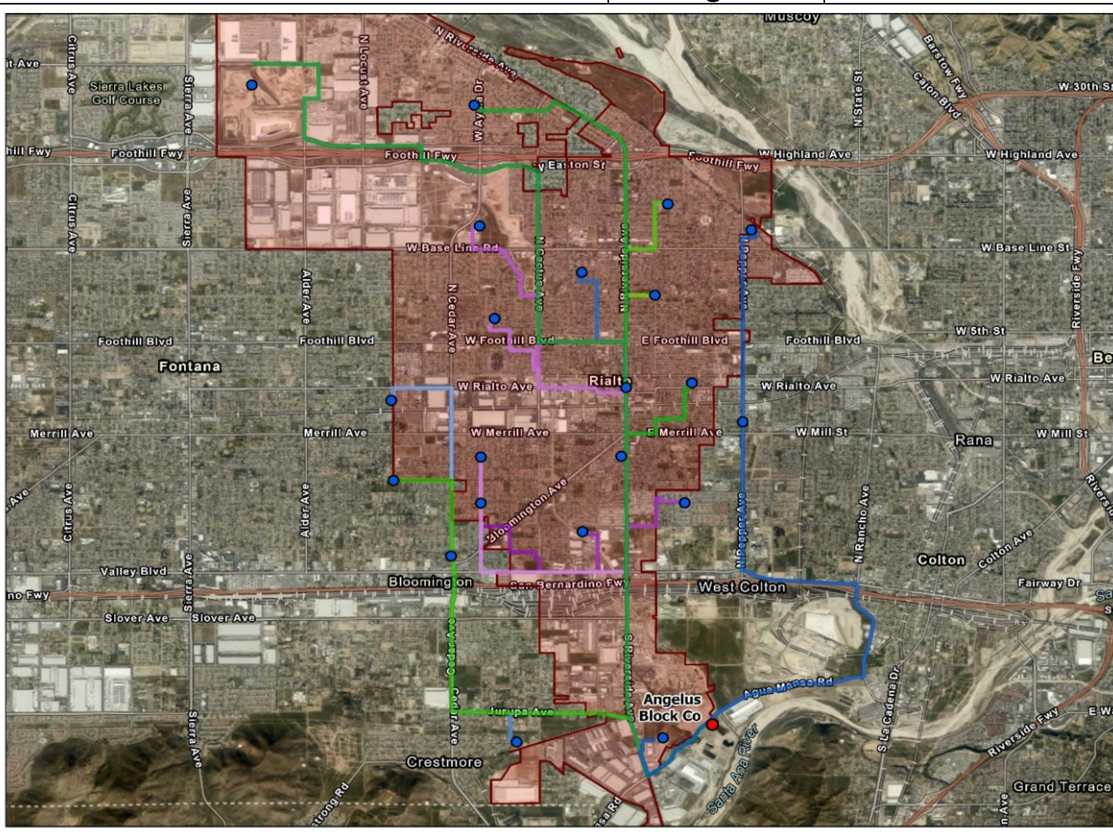
Project TAZ (ID: 53755201)	Total Employees	Wage Level			Employment Industry
		Low Income	Medium Income	High Income	Manufacturing
Baseline (2016) SED Data Assumptions	512	244.3	123.5	144.1	126.6
Adjusted Baseline (2016) SED Data Assumptions	587	254.3	173.5	159.1	201.6
Cumulative (2040) SED Data Assumptions	1028	622.8	217.7	187.5	89.4
Adjusted Cumulative (2040) SED Data Assumptions	1103	632.8	267.7	202.5	164.4

Angelus Block Company
VMT Analaysis
Future Model Year Socioeconomic Data Adjustments

	Cumulative (2040) SED Data Assumptions					Adjusted Cumulative (2040) SED Data Assumptions - With Project Condition				
	Total	Wage Level			Employment Industry	Total	Wage Level			Employment Industry
TAZ ID	Employees	Low Income	Medium Income	High Income	Manufacturing	Employees	Low Income	Medium Income	High Income	Manufacturing
53775301	1127	560.2	466.8	100.0	728.0	1116	558.2	460.8	97.0	717.0
43240200	2751	1592.0	711.0	448.0	392.0	2745	1591.0	707.0	447.0	386.0
43144300	3333	1506.0	883.0	944.0	355.0	3327	1505.0	879.0	943.0	349.0
43246100	1633	939.0	377.0	317.0	161.0	1630	939.0	376.0	315.0	158.0
53753201	1939	1135.9	497.6	305.5	158.2	1936	1135.9	496.6	303.5	155.2
53774102	1134	746.3	268.2	119.5	154.3	1131	746.3	267.2	117.5	151.3
43249200	1314	773.0	296.0	245.0	118.0	1312	773.0	295.0	244.0	116.0
53775302	173	86.0	71.7	15.4	110.6	171	86.0	70.7	14.4	108.6
43144400	915	601.0	180.0	134.0	101.0	913	601.0	179.0	133.0	99.0
53760101	3350	2277.0	654.7	418.3	100.3	3348	2277.0	653.7	417.3	98.3
43249300	998	571.0	231.0	196.0	100.0	996	570.0	230.0	196.0	98.0
43251100	779	467.0	159.0	153.0	97.0	777	466.0	158.0	153.0	95.0
53749301	1263	753.3	315.2	194.5	96.5	1261	752.3	314.2	194.5	94.5
53789301	358	209.7	90.2	58.1	95.0	356	208.7	89.2	58.1	93.0
43240100	518	281.0	146.0	91.0	93.0	516	280.0	145.0	91.0	91.0
53789302	298	174.5	75.1	48.4	90.4	296	173.5	74.1	48.4	88.4
43258100	567	366.0	128.0	73.0	74.0	566	366.0	127.0	73.0	73.0
43238100	2525	1749.0	461.0	315.0	73.0	2524	1749.0	460.0	315.0	72.0
53753401	667	364.1	150.4	152.5	70.7	666	364.1	149.4	152.5	69.7
53757401	3394	2344.9	672.6	376.4	70.4	3393	2344.9	671.6	376.4	69.4
53773201	648	396.8	163.6	87.6	65.7	647	396.8	162.6	87.6	64.7
53760301	575	355.3	119.5	100.1	49.4	574	355.3	118.5	100.1	48.4
53749302	603	359.6	150.5	92.9	45.2	602	359.6	149.5	92.9	44.2
53774501	585	348.2	149.9	86.8	44.9	584	348.2	148.9	86.8	43.9
53757302	1652	1151.1	285.0	216.0	44.3	1651	1151.1	284.0	216.0	43.3
53748101	819	559.2	211.8	48.0	40.4	818	559.2	210.8	48.0	39.4
43249100	1351	935.0	247.0	169.0	39.0	1350	935.0	246.0	169.0	38.0
53759302	97	88.5	7.5	0.9	36.0	96	88.5	6.5	0.9	35.0
43144200	1226	849.0	224.0	153.0	35.0	1225	849.0	223.0	153.0	34.0
53770202	1811	1230.9	352.6	227.5	31.6	1810	1230.9	351.6	227.5	30.6
53748801	784	517.5	129.6	136.8	29.1	783	517.5	128.6	136.8	28.1
53744201	766	491.5	163.4	111.1	29.1	765	491.5	162.4	111.1	28.1
53757501	1377	936.8	268.4	171.8	28.7	1376	936.8	267.4	171.8	27.7
43244200	970	671.0	178.0	121.0	28.0	969	671.0	177.0	121.0	27.0
53754301	858	583.6	167.0	107.4	26.3	857	583.6	166.0	107.4	25.3
53773101	267	165.7	65.8	35.5	25.3	266	165.7	64.8	35.5	24.3
53752101	1496	909.5	361.4	225.0	25.2	1495	909.5	360.4	225.0	24.2
53774301	326	220.1	68.4	37.5	25.1	325	220.1	67.4	37.5	24.1
53748701	482	357.9	77.0	47.1	25.0	481	357.9	76.0	47.1	24.0
53755201	1028	622.8	217.7	187.5	89.4	1103	632.8	267.7	202.5	164.4
Total	46757	29247	10443	7067	4001	46757	29247	10443	7067	4001

City Employee VMT Results

Residence Location	Workplace Location	Number of Workers Eligible	Vehicle Miles Traveled (Total)
C3100US06071004004	C3100US06071004004	215	2.67
C1100US06071004401	C3100US06071004004	25	10.34
C1100US06071003605	C3100US06071004004	4	10.10
C1100US06071003609	C3100US06071004004	10	7.72
C1100US06071003611	C3100US06071004004	15	8.79
C1100US06071003503	C3100US06071004004	10	16.16
C1100US06071003507	C3100US06071004004	25	13.92
C1100US06071003603	C3100US06071004004	4	11.12
C1100US06071003405	C3100US06071004004	15	14.36
C1100US06071003606	C3100US06071004004	4	9.42
C1100US06071004003	C3100US06071004004	15	5.66
C1100US06071003607	C3100US06071004004	20	8.73
C1100US06071003505	C3100US06071004004	4	13.44
C1100US06071003804	C3100US06071004004	30	14.81
C1100US06071003803	C3100US06071004004	15	12.63
C1100US06071003801	C3100US06071004004	30	14.87
C1100US06071003403	C3100US06071004004	40	12.07
C1100US06071003700	C3100US06071004004	10	10.13
C1100US06071003900	C3100US06071004004	20	11.32
C1100US06071002705	C3100US06071004004	20	18.58
C1100US06071002704	C3100US06071004004	90	23.83
		Average VMT	**11.94**



Delivering Solutions
Improving Lives

Table 2-1: Mitigation Monitoring and Reporting Program

#	Mitigation Measure	Implementation Responsibility	Agency Responsible for Monitoring	Monitoring/Reporting Action	Verification Record		
					Date	Comments	Initials
AIR QUALITY							
AQ-1	Purchase and utilize forklifts and portable equipment that meets or exceeds Tier 4 Final emission standards.	Project Applicant	City of Rialto Development Services Department, Planning Division	Imposition of conditions of approval for applicable land use applications.			
AQ-2	Utilize Tier 4 construction equipment.	Project Applicant/Construction Contractor	City of Rialto Development Services Department, Building Division (building construction)	Referenced as a note on grading plans and building plans. Site inspection.			
BIOLOGICAL RESOURCES							
BIO-1	Maintain the Delhi Sands flower-loving fly (DSFLF) "Conservation Area" and adhere to the established Incidental Take Permit and Implementation Agreement.	Project Applicant	City of Rialto Development Services Department, Planning Division	Imposition of conditions of approval for applicable land use applications.			
TRANSPORTATION							
TRA-1	Submit fair share cost of $724,397.81 to the City of Rialto related to the Development Impact Fee (DIF) for Intersection and Roadway Improvements.	Project Applicant	City of Rialto Development Services Department, Planning Division	Imposition of conditions of approval for applicable land use applications.			

TRAFFIC IMPACT STUDY FOR

ANGELUS BLOCK CO., INC. PROPOSED MANUFACTURING FACILITY

DATE:
September 6, 2021

LOCATION:
Rialto, California

PREPARED FOR:
City of Rialto, California

PREPARED BY:
NV5 Engineers and Consultants, Inc.
Contact: Victoria Guobaitis, PE, PTOE, TE
1655 Canton St. Suite G
Roswell, GA 30075
678-795-3633
Victoria.Guobaitis@NV5.com

REGISTERED PROFESSIONAL ENGINEER
VICTORIA GUOBAITIS
TR2937
9/6/21
TRAFFIC
STATE OF CALIFORNIA

NV5
nv5.com

CONTENTS

LIST OF TABLES

LIST OF FIGURES

A. Introduction

A.1. Purpose of the TIA and Study Objectives

This Traffic Impact Analysis has been prepared to address the traffic-related impacts of the proposed Angelus Block Co. manufacturing facility in the City of Rialto.

This traffic study has been conducted in accordance with the City of Rialto's *Traffic Impact Analysis Report Guidelines and Requirements* (December 2013), and in accordance with the San Bernardino County Transportation Authority (SBCTA) Congestion Management Program (CMP). A scoping agreement with the City of Rialto is included in Appendix A.

This report includes a description of existing traffic conditions in the surrounding area, estimated project trip generation and distribution, future traffic growth, and an assessment of project-related impacts on the roadway system. Where necessary, circulation system improvements have been identified to achieve acceptable intersection operation in the vicinity of the project.

This project will be evaluated for the following conditions:

- Existing Conditions 2020
- Opening Year 2022
- Opening Year 2022 Plus Project
- Opening Year 2022 Cumulative
- Opening Year 2022 Cumulative Plus Project

A.2. Site Plan Location and Study Area

The proposed site is located east of S Riverside Avenue and north of Agua Mansa Road in the southern part of Rialto. The site is located approximately 1.5 miles south of Interstate 10 (I-10). Land use in the area is primarily industrial and manufacturing within the study area. Figure 1 on the next page shows the site location relative to the nearby transportation network. A stand-alone figure is included in the Appendix B.

A.3. Development Project Identification

Per the site plan dated 02/10/2021, the parcels proposed for development are as follows:

- Parcel 0260-061-67-0000
- Parcel 0260-061-41-0000
- Parcel 0260-061-42-0000

A.4. Development Project Description

The site is located within the Agua Mansa Specific Plan. The industrial corridor is 4,285 acres, located south of I-10 and west of I-215 on the western bank of the Santa Ana River. The corridor is approved for a variety of land uses, including industrial, agricultural, and residential.

Figure 1. Vicinity Map

The proposed site is located on the 8th subset within the Agua Mansa Specific Plan which is consisted of primarily general industry land-use with minimal residential. The project will involve the construction of a manufacturing plant building with 135,581 square feet, an office building with 10,018 square feet, a storage warehouse with 14,160 square feet, a mechanical shop with 7,200 square feet and a metal canopy with 21,534 square feet. The total area of these site components is 188,493 square feet. A copy of the site plan is provided on Figure 2. A full plan sheet is included in the Appendix C.

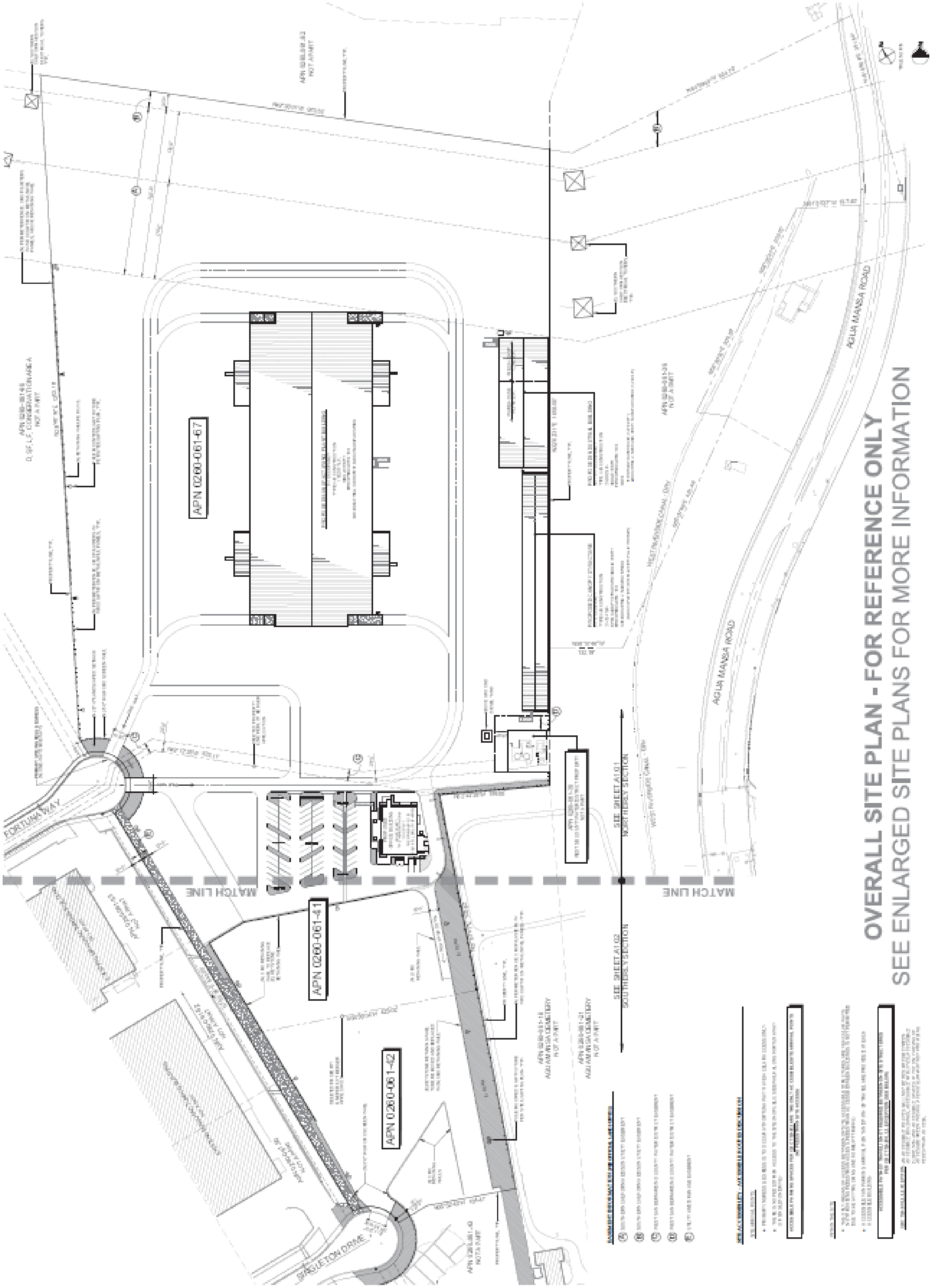
Access to the site is provided via a cul-de-sac at the end of Fortuna Way. There are two one-way driveways spaced out within this cul-de-sac: one for entering and one for exiting. A secondary entrance is located at the end of Singleton Drive at the southern portion of the proposed site. This entrance is dedicated to construction vehicles and will not be used for daily operations once construction of the site is complete.

The proposed site is expected to be completed in 2022 in a single phase. The location of the site as well as the study area is located with the City of Rialto and San Bernardino County. The site is also located within the sphere of influence of, or 1-mile from, the City of Colton and the City of Jurupa Valley.

A.5. Proposed Site Operations

The operation of the site includes the manufacturing of concrete blocks. Raw materials arrive in trucks (i.e., cement, sand) and are unloaded into the proposed manufacturing plant building. The raw materials are mixed accordingly and poured into block forms to cure inside this building. Once curing is complete, the blocks are either purchased and hauled off-site or moved to the canopy structure for secondary processing. Secondary processing includes some customization of the concrete blocks before they are either stored or purchased. The warehouse building, as designated in the plans, stores materials that are used throughout the site. The mechanical shop is where machinery is maintained and stored when not in use (i.e., forklifts). The office building on site supports the use of the rest of the site. It would house administrative offices for the operations as well as facilitate the selling of the final product.

Figure 2. Site Plan



A.6. Analysis Methodology

A.6.1. Intersection Analysis – HCM Methodology

Peak hour intersection operations at signalized and unsignalized intersections were evaluated using the methods prescribed in the Highway Capacity Manual (HCM) 6th Edition, consistent with the requirements of the City of Rialto *Traffic Impact Analysis Report Guidelines and Requirements* and the San Bernardino County CMP.

The City of Rialto *Traffic Impact Analysis Report Guidelines and Requirements* requires analysis of traffic operations to be based on the vehicular delay methodologies of the Highway Capacity Manual (HCM). The intersection analysis for the proposed project has been accomplished using the Synchro 11 software program and using specified input parameters outlined in the City's *Traffic Impact Analysis Report Guidelines and Requirements*.

Per the HCM Methodology, Level of Service (LOS) for signalized intersections is defined in terms of average vehicle delay. Specifically, LOS criteria are stated in terms of the average control delay per vehicle for the peak 15-min period within the hour analyzed. Table 1 on the following pages provide a description of the operating characteristics of each Level of Service. Tables 2 defines the LOS in terms of average seconds of delay for signalized and unsignalized intersections.

A.6.2. Level of Service Standards and Measure of Significance.

The City of Rialto *Traffic Impact Analysis Report Guidelines and Requirements* references the General Plan minimum Level of Service standards. According to Policy 4-1.20 of the General Plan document, city streets with signalized intersections are required to operate at LOS D or better during peak hours. The one exception being Riverside Avenue which can operate at LOS E, Riverside Avenue is part of this study. Policy 4-1.21 of the General Plan document states that unsignalized intersections operate with the average delay being 120 seconds or less during the peak hours. The City's *Traffic Impact Analysis Report Guidelines and Requirements* requires a new development to mitigate impacts that cause the Level of Service to fall below LOS D (E for Riverside Avenue), or the peak hour delay to increase as follows:

- LOS A/B – by 10.0 seconds
- LOS C – by 8.0 seconds
- LOS D – by 5.0 seconds
- LOS E – by 2.0 seconds
- LOS F – by 1.0 second

Table 1: Level of Service Definitions, Highway Capacity Manual (HCM), 6th Edition

LEVEL OF SERVICE DEFINITIONS	
Level of Service	**Description**
A	No approach phase is fully utilized by traffic and no vehicle waits longer than one red indication. Typically, the approach appears quite open, turns are made easily and nearly all drivers find freedom of operation.
B	This service level represents stable operation, where an occasional approach phase is fully utilized and a substantial number are approaching full use. Many drivers begin to feel restricted within platoons of vehicles.
C	This level still represents stable operating conditions. Occasionally drivers may have to wait through more than one red signal indication, and backups may develop behind turning vehicles. Most drivers feel somewhat restricted but not objectionably so.
D	This level encompasses a zone of increasing restriction, approaching instability at the intersection. Delays to approaching vehicles may be substantial during short peaks within the peak period; however, enough cycles with lower demand occur to permit periodic clearance of developing queues, thus preventing excessive backups.
E	Capacity occurs at the upper end of this service level. It represents the most vehicles that any particular intersection approach can accommodate. Full utilization of every signal cycle is seldom attained no matter how great the demand.
F	This level describes forced flow operations at low speeds, where volumes exceed capacity. These conditions usually result from queues of vehicles backing up from a restriction downstream. Speeds are reduced substantially, and stoppages may occur for short or long periods of time due to the congestion. In the extreme case, both speed and volume can drop to zero.

Table 2: Level of Service Criteria, Highway Capacity Manual (HCM), 6th Edition

LEVEL OF SERVICE CRITERIA FOR SIGNALIZED AND UNSIGNALIZED INTERSECTIONS		
Level of Service	**Signalized Intersection[1]**	**Unsignalized Intersection[2]**
A	≤ 10	0-10
B	> 10 - 20	> 10 - 15
C	> 20 - 35	> 15 - 25
D	> 35 - 55	> 25 - 35
E	> 55 - 80	> 35 - 50
F	> 80	> 50

[1]Source: Highway Capacity Manual (HCM 6th Edition), Exhibit 19-8, Average Delay in Seconds/Vehicle
[2]Source: Highway Capacity Manual (HCM 6th Edition), Exhibit 20-2, Average Delay in Seconds/Vehicle

A.6.1. Roadway Segment Analysis

The roadway segment analysis will address the project's impact on daily operating conditions on roadway segments within the project vicinity. Roadway segments are evaluated by comparing the daily traffic volume on the roadway segment to the daily capacity of that segment, to determine the volume-to-capacity (v/c) ratio. Daily capacity is based on the roadway classification, as shown in Table 3.

Table 3: Level of Service Criteria, Segments

CITY OF RIALTO CAPACITY[1]				
Roadway Capacity	No. of Lanes	Two-Way Traffic Volume (ADT)[2]		
		Service Level C	Service Level D	Service Level E
Local	2	2,500-2,799	2,800-3,099	3,100 +
Collector (60' or 64')	2	9,900-11,199	11,200-12,499	12,500 +
Industrial (45')	2	9,900-11,199	11,200-12,499	12,500 +
Arterial [3]	2	14,400-16,199	16,200-17,999	18,000 +
Secondary Highway	4	16,900-19,399	19,400-21,999	22,000 +
Modified Arterial (100')	4	26,200-29,599	29,600-32,999	33,000 +
Arterial (120')	6	38,700-44,099	44,100-49,499	49,500 +

[1]All capacity figures are based on optimum conditions and are intended as guidelines for planning purposes only
[2]Maximum two-way ADT values are based on the 1999 Modified Highway Capacity Manual Level of Service Tables.
[3]Two-lane roads designated as future arterials that conform to arterial design standards for vertical and horizontal alignments are analyzed as arterials.
Source: City of Rialto Traffic Impact Analysis Report Guidelines and Requirements (2013)

Based on the General Plan document, all segments must operate at LOS D or better. The exception to that rule is Riverside Avenue between the Metrolink Tracks to the southern border of the City of Rialto. Between these points, Riverside Avenue can operate at LOS E. The table above does not include an upper limit of capacity for a roadway segment to operate at LOS E. As a result, this limit was extrapolated by calculating the difference between the other limits of each roadway class. The study segments include modified arterial (100') and arterial (120'). The difference between LOS C and D was calculated and that value was applied to the lower LOS limit. Arterial (120') changes by 5,400 vehicles, which means the upper threshold of LOS E is ***54,900***. Modified Arterial (100') changes by 3,400 vehicles, which means the upper threshold for LOS E is ***36,400***. These values will be used as the capacity of the Riverside Avenue segments per the General Plan document.

B. Area Conditions

B.1. Identify Study Area and Intersections

The study includes a discussion of existing (2020) traffic volumes, future (2022) traffic volumes, trip generation, directional distribution, and the impacts of new traffic at the study intersections.

The scope of this traffic impact analysis was coordinated with staff from the City of Rialto. This study includes analysis of the Existing Conditions, Existing Plus Growth (also known as Opening Year) Conditions, Opening Year Plus Project Trips, Opening Year Plus Cumulative Growth (trips associated with developments to be constructed between the date of this report and project completion), and finally Opening Year Plus Cumulative Growth Plus Project Trips for the following locations:

1. S Riverside Avenue at W Valley Boulevard
2. S Riverside Avenue at I-10 WB ramps
3. S Riverside Avenue at I-10 EB ramps
4. S Riverside Avenue at Slover Avenue
5. S Riverside Avenue at Santa Ana Avenue
6. S Riverside Avenue at Industrial Drive
7. S Riverside Avenue at Jurupa Avenue
8. S Riverside Avenue at Resource Drive/Industrial Drive
9. S Riverside Avenue at Singleton Drive
10. S Riverside Avenue at Agua Mansa Road
11. Industrial Drive at Fortuna Way
12. Resource Drive at Enterprise Drive
13. S Riverside Avenue: I-10 WB ramps to I-10 EB ramps
14. S Riverside Avenue: I-10 EB ramps to Slover Avenue
15. S Riverside Avenue: Slover Avenue to Santa Ana Avenue
16. S Riverside Avenue: Santa Ana Avenue to Industrial Drive
17. S Riverside Avenue: Resource Drive to Agua Mansa Road

The report summarizes the data collected, background and projected traffic at the study locations, analysis of traffic impacts including levels of service (LOS), assessment of the site entrance, and conclusions/recommendations from the analysis.

Appendix C includes a copy of the site development concept plan.

B.2. Description of Existing Roads, Traffic Controls, and Intersection Geometries

The site will be accessed primarily via I-10 approximately 1.5 miles north of the site. I-10 serves as the primary east-west freeway and connects the site eastward toward San Bernardino and westward toward Los Angeles. Further description of all roadways within the study area are summarized below.

Existing lane configuration and intersection control at the study intersections was confirmed in a site visit conducted in April 2020. Figure 3 summarizes both lane configurations and intersection control as verified in April 2020. This information was then used to build a model to conduct the operational analysis of the study area.

Interstate 10 (I-10) Ramps are exit and entrance ramps to I-10 an east-west freeway that has a posted speed limit of 70 MPH. The entrance ramps are metered and have one high occupancy vehicle (HOV) lane and two general purpose lanes at the intersection with S Riverside Ave. The exit ramps have three general purpose lanes at the intersection of S Riverside Ave.

South Riverside Avenue is a north-south road designated as a Modified Major Arterial II as classified by the General Plan for the City of Rialto (December 2010). A modified Major Arterial II has three lanes of travel in each direction with medians to accommodate the heavy traffic flow near freeway intersections, intersections 1 and 2. Near the project site S Riverside has two lanes of travel in each direction with a two-way left-turn lane (TWLTL) median. South of Santa Ana Road the posted speed is 55 MPH, north of Santa Ana Road the posted speed limit is 50 MPH. S Riverside Avenue connects to Interstate 10, State Route 66, and State Route 210 to the north of the project site. To the south S Riverside Ave changes to Main Street. S Riverside Avenue is also classified as a Terminal Access truck route.

Agua Mansa Road is a northeast-southwest road designated as a Major Arterial by the General Plan for the City of Rialto (December 2010). A Major Arterial has at least two lanes of travel in each direction and parking lanes. Near the project site Agua Mansa Road has two lanes heading westbound and one lane heading eastbound. It has a posted speed limit of 45 MPH.

Slover Avenue is an east-west road designated as a Major Arterial by the General Plan for the City of Rialto (December 2010). Near the project site Slover Avenue has two lanes of travel in each direction with a two-way left-turn lane (TWLTL) to the west of S Riverside Avenue and two lanes of travel westbound and one lane of travel eastbound to the east of S Riverside Ave. It has a posted speed limit of 45 MPH. Slover Ave is a Terminal Access truck route.

Santa Ana Avenue is an east-west road designated as a Secondary Arterial to the west of S Riverside Ave and a Collector Street to the east. Santa Ana Avenue has one lane of travel in each direction. It has a posted speed limit of 40 MPH. Santa Ana Avenue is a Terminal Access truck route.

Industrial Drive is a north-south, approximately 0.7-mile, local street. Industrial Drive has no posted speed limit. For operational analysis, it is assumed to be 25 MPH. Industrial Drive is the connection from the project site to S Riverside Ave.

Fortuna Way is a 0.1-mile-long local road that serves as the only driveway to the project site connecting to Industrial Drive. There is no posted speed limit; therefore, for operational analysis, it is assumed to be 25 MPH.

Resource Drive is an approximately 0.4-mile-long local road. There is no posted speed limit; therefore, for our analysis it is assumed to be 25 MPH.

Enterprise Drive is an approximately 0.3-mile-long local road. There is no posted speed limit; therefore, for our analysis it is assumed to be 25 MPH.

B.3. Existing Traffic Volumes

Due to the state-mandated lock-down starting in March 2020 (implemented as a result of the COVID-19 pandemic), traffic patterns have been irregular near the proposed site. Obtaining new counts for what the traffic engineering industry constitutes as "normal" conditions has not been feasible. Because new traffic counts were not feasible, historic traffic counts taken before March of 2020 were obtained from the City of Rialto as well as from local traffic counting companies. All historic counts obtained are from 2018 or 2019. To establish an existing base year 2020 traffic network, a 2% growth rate per year was applied to the historic counts. All counts obtained are included in Appendix D.

Of the 12 intersections in the study area, historic counts were obtained for 9 of them. Figure 4 shows the lane configuration for the 12 intersections. Traffic counts for Industrial Drive at Fortuna Way, S Riverside Avenue at Singleton Drive, and Resource Drive at Enterprise Drive were not available. Counts associated with this intersection were estimated using the adjacent intersection approach and receiving volumes as well as an estimate of trip generation based adjacent land uses.

Turning movement counts from 2018 were obtained for the following study area intersections:

- S Riverside Avenue at I-10 WB ramps
- S Riverside Avenue at I-10 EB ramps
- S Riverside Avenue at Slover Avenue
- S Riverside Avenue at Santa Ana Avenue
- S Riverside Avenue at Industrial Drive
- S Riverside Avenue at Jurupa Avenue
- S Riverside Avenue at Resource Drive/Industrial Drive

Turning movement counts from 2019 were obtained for the following study area intersection:

- S Riverside Avenue at Agua Mansa Road

Turning movement counts from 2020 were obtained for the following study area intersection:

- S Riverside Avenue at W Valley Boulevard

Figure 3. Study Intersections

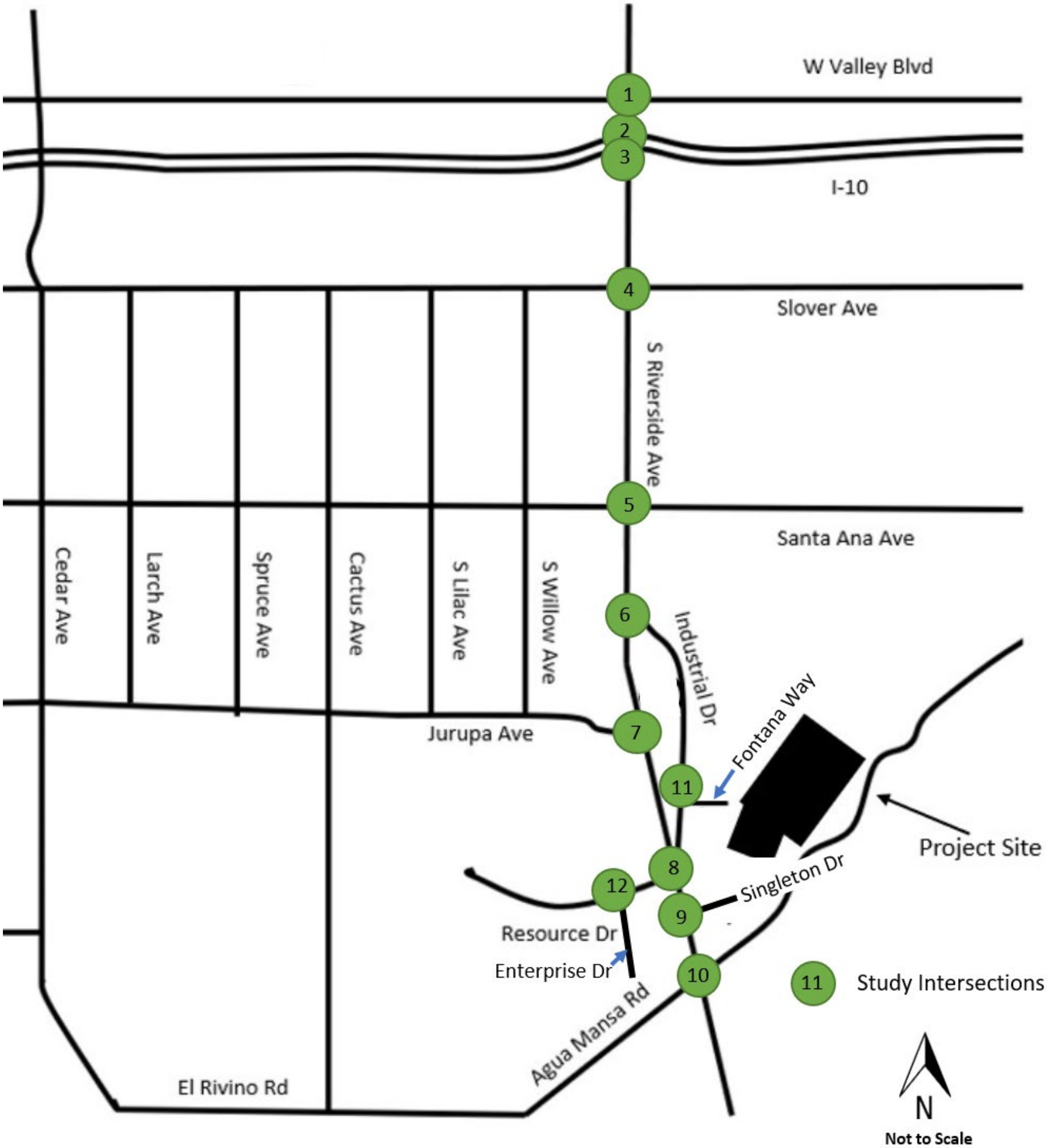
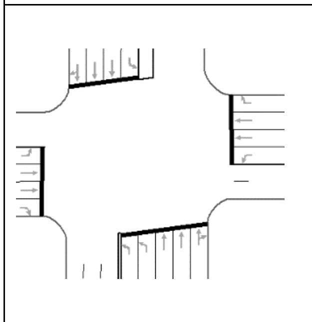
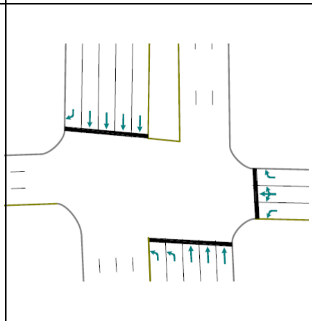
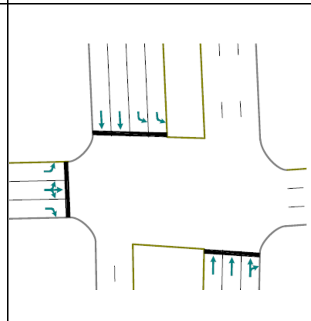
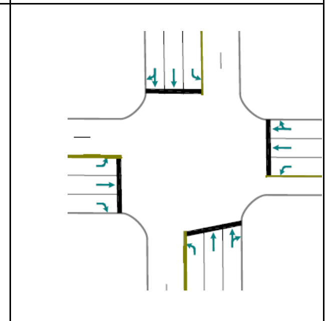
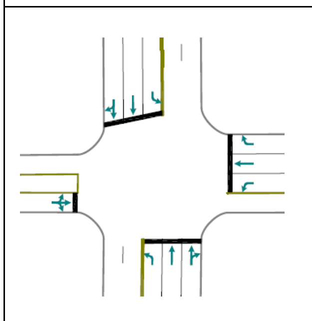
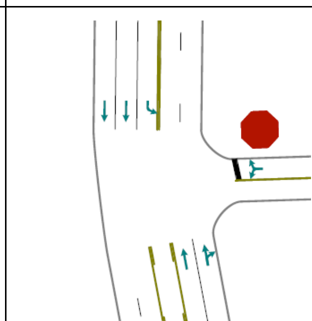
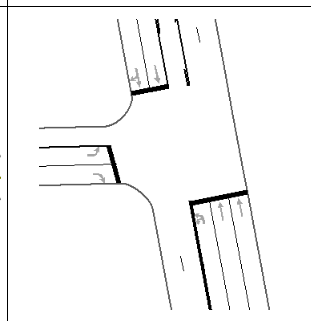
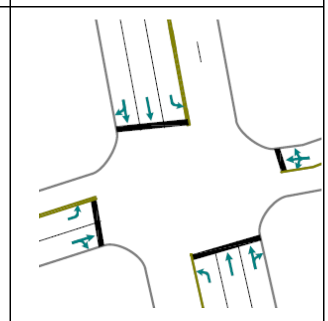
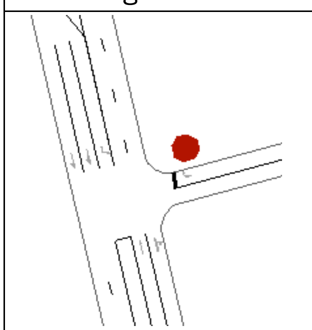
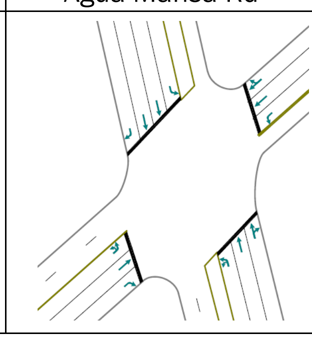
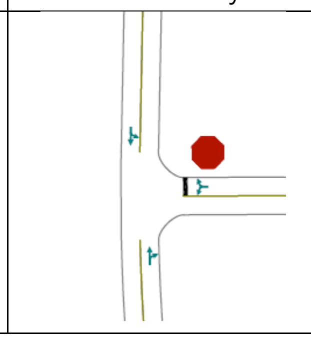
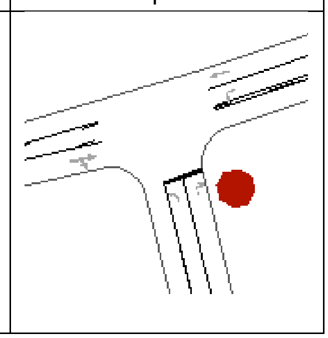


Figure 4. Existing Lane Configuration and Traffic Control

1. S Riverside Ave at W Valley Blvd	2. S Riverside Ave at I-10 WB Ramps	3. S Riverside Ave at I-10 EB Ramps	4. S Riverside Ave at Slover Ave
			
5. S Riverside Ave at Santa Ana Ave	6. S Riverside Ave at Industrial Dr	7. S Riverside Ave at Jurupa Ave	8. S Riverside Ave at Resource Dr/Industrial Dr
			
9. S Riverside at Singleton Dr	10. S Riverside Ave at Agua Mansa Rd	11. Industrial Dr at Fortuna Way	12. Resource Dr at Enterprise Dr
			

Of the five segments included in the segment analysis, historic traffic counts were obtained for two segments, both in 2018:

- S Riverside Avenue: I-10 EB ramps to Slover Avenue
- S Riverside Avenue: Slover Avenue to Santa Ana Avenue

Segment annual daily traffic (ADT) for the remaining three segments was estimated by calculating the k-factors for nearby segments. The k-factor is the ratio of peak hour traffic to the ADT of the same segment. This k-factor was then applied to the peak hour volumes of the unknown segments (from the turning movement counts) to obtain an estimated ADT.

Because the site is considered a "truck-intensive" land-use per the City of Rialto *Traffic Impact Analysis Report Guidelines and Requirements*, all existing traffic counts were converted to passenger car equivalent (PCE) trips. This process is used to incorporate heavy truck usage into the operational analysis of the transportation network. Truck classification information is needed to compute the PCE volumes. Due to the data constraints, only one segment included vehicle classifications for passenger vehicles and trucks. However, the intersection peak hour counts were classified by vehicle type. As a result, the total truck percentage and the average PCE factor was calculated for the adjacent intersections of each segment and averaged together to calculate a truck percentage and average PCE factor for each segment. The final PCE value was calculated using these averages. PCE values were developed with the City of Rialto *Traffic Impact Analysis Report Guidelines and Requirements* factors: 1.5 for 2-axle trucks, 2.0 for 3-axle trucks, and 3.0 for 4+ axle trucks. PCE volume worksheets are provided in Appendix E.

The data from these counts help to establish an overall picture of the existing traffic conditions within the study area. Figure 5 presents the existing (2020) traffic volumes for these locations.

B.4. Existing Delay and Level of Service

B.4.1. Peak Hour Intersection Operating Conditions

Intersection Level of Service analysis was conducted for the AM and PM peak hours using the analysis procedures described previously in this report. The results of the intersection analysis for Existing Conditions are shown in Table 1. Synchro outputs of Existing Conditions intersection analysis worksheets are provided in Appendix F.

Table 4 indicates that all study intersections are currently operating at an acceptable Level of Service—LOS E for intersections along Riverside Avenue and LOS D for the two intersections not on Riverside Avenue.

B.4.1. Daily Roadway Segment Operating Conditions

Roadway Level of Service analysis was conducted based on the roadway capacities presented previously in this report. The results of the roadway analysis for Existing Conditions are shown in Table 5.

Table 5 indicates that the study roadway segments are currently operating at capacities above the acceptable Level of Service threshold. This means that in existing conditions, no roadway segments meet the General Plan Guidelines.

B.5. Transit Service

Transit service in Rialto, California is provided by OmniTrans transit lines, which serve various San Bernardino cities in the area. There are no bus stops within half a mile of the project site based on the transit map from the General Plan shown in Figure 6.

Figure 5. Existing (2020) Volumes

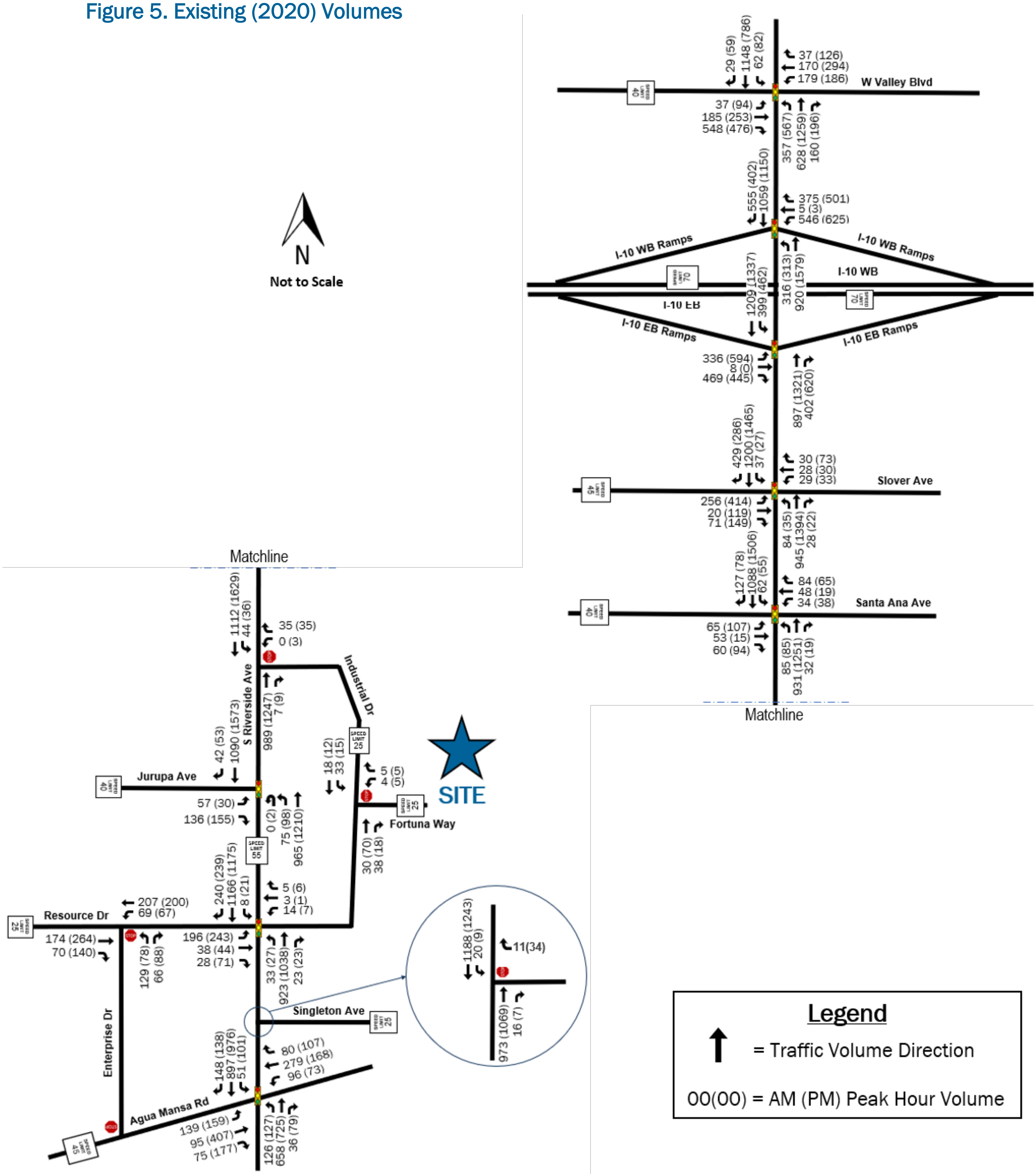


Table 4: Existing (2020) Peak Hour Intersection Operations

Int. #	Intersection	Traffic Control	AM Peak Hour		PM Peak Hour	
			Delay	LOS	Delay	LOS
1	S Riverside Ave & W Valley Blvd	Signal	43.3	D	37.6	D
2	S Riverside Ave & I-10 WB Ramps	Signal	22.5	C	20.9	C
3	S Riverside Ave & I-10 EB Ramps	Signal	26.3	C	38.2	D
4	S Riverside Ave & Slover Ave	Signal	39.3	D	77.1	E
5	S Riverside Ave & Santa Ana Ave	Signal	23.3	C	32.4	C
6	S Riverside Ave & Industrial Dr	Stop Controlled	16.0	C	20.4	C
7	S Riverside Ave & Jurupa Ave	Signal	10.5	B	17.0	B
8	S Riverside Ave & Resource Dr/Industrial Dr	Signal	26.4	C	28.9	C
9	S Riverside Ave & Singleton Dr	Stop Controlled	12.7	B	13.8	B
10	S Riverside Ave & Agua Mansa Rd	Signal	26.6	C	41.9	D
11	Industrial Dr & Fortuna Way	Stop Controlled	9.5	A	9.6	A
12	Resource Dr & Enterprise Dr	Stop Controlled	14.6	B	14.4	B

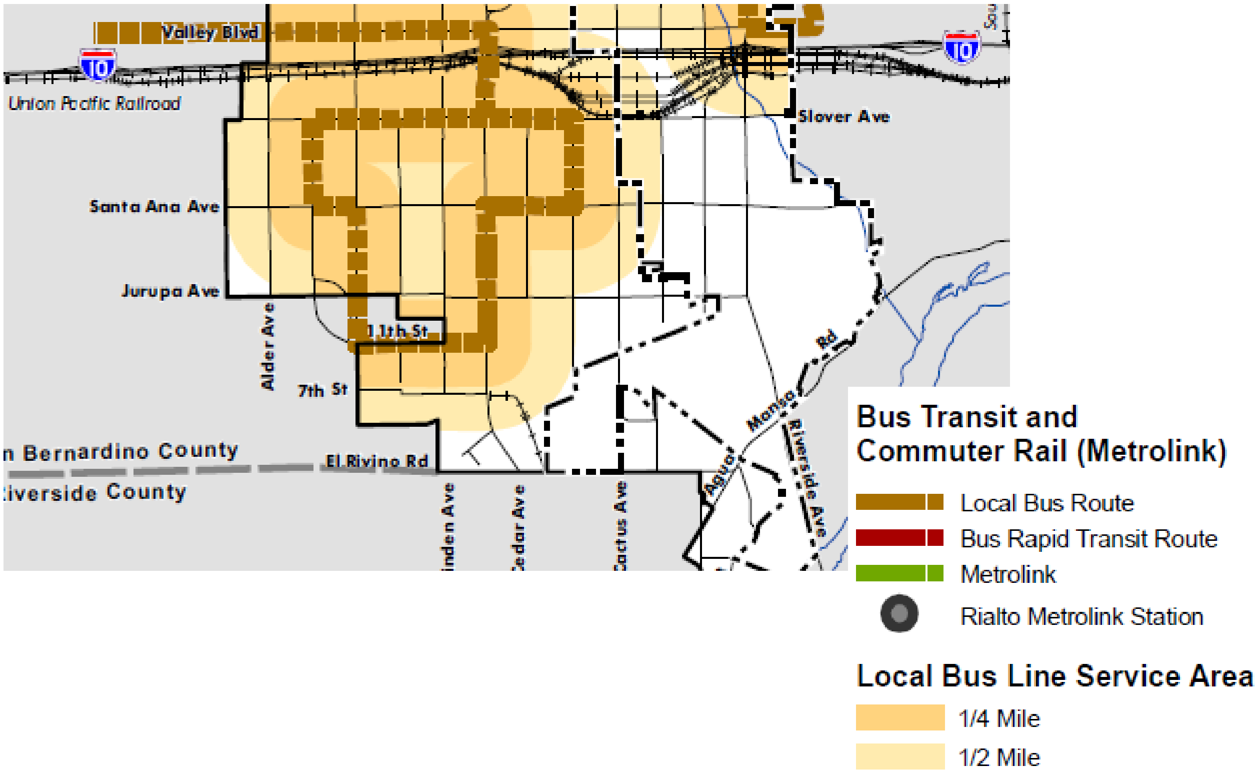
Notes: BOLD and shaded values indicate intersections operating at LOS F
At signalized intersections, delay refers to the average control delay for the entire intersection, measured in seconds/vehicle
At stop-controlled intersections, delay refers to the average vehicle delay on the worst (highest delay) movement
Delay values are based on methodology outlines in the 6th Edition Highway Capacity Manual.

Table 5: Existing (2020) Roadway Segment Operations

Roadway	Segment	Current LOS E Capacity	Existing ADT in PCE	LOS E or better?
S Riverside Ave	I-10 WB ramps to I-10 EB ramps	54,900	59,410	No
	I-10 EB ramps to Slover Ave	36,400	56,753	No
	Slover Ave to Santa Ana Ave	36,400	51,250	No
	Santa Ana Ave to Industrial Dr	36,400	65,161	No
	Resource Dr to Agua Mansa Rd	36,400	53,143	No

Notes: Daily roadway counts were collected in 2018. Counts were increased by 2%/year to bring the existing ADT to 2020.
LOS = Level of Service
ADT = Average Daily Traffic
PCE = Passenger Car Equivalent

Figure 6. Transit Service

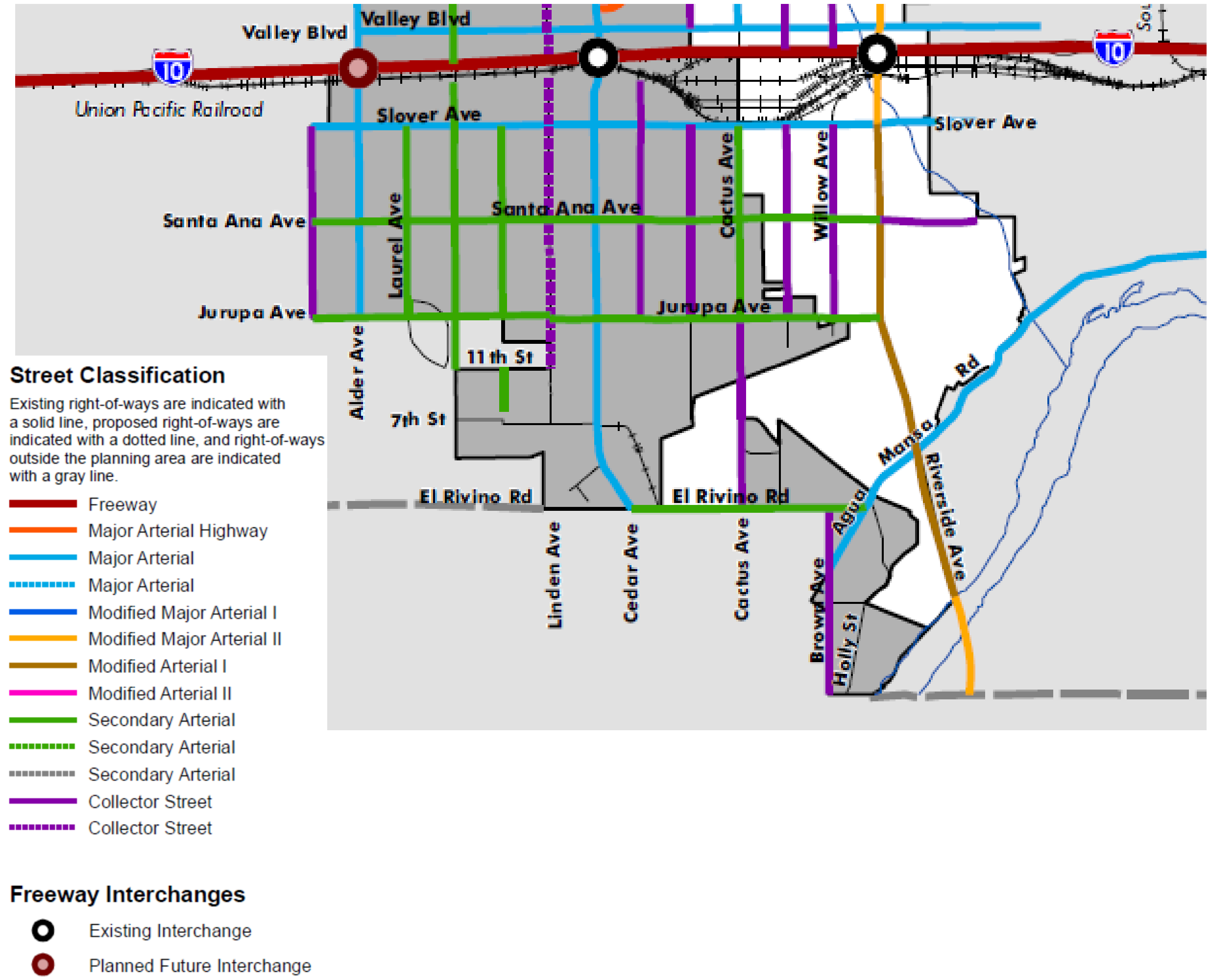


Source: City of Rialto General Plan Update (2010)

B.6. General Plan Circulation Element

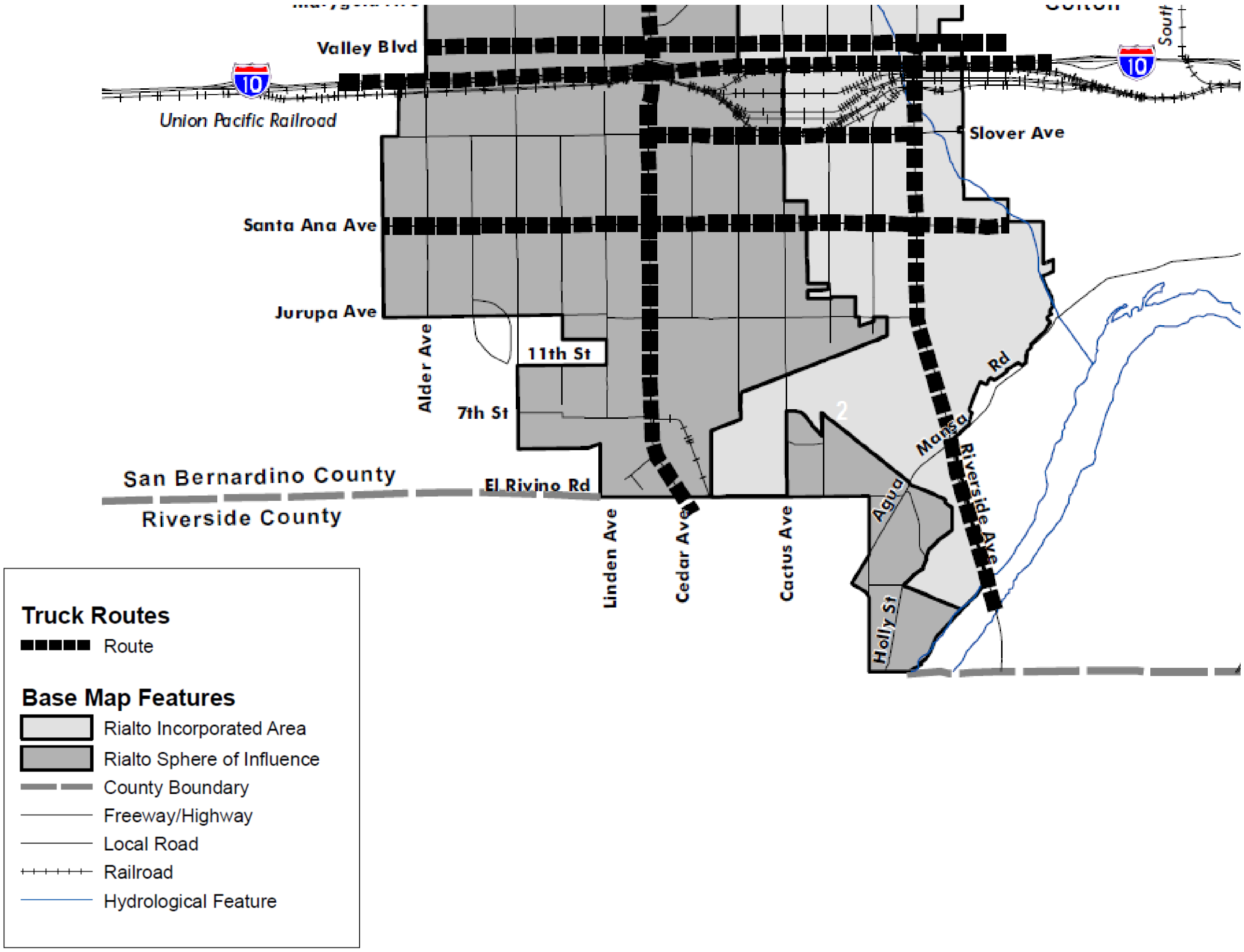
The Circulation Element refers to the General Plan for roadway designations for the project and the surrounding facility. The General Plan was approved in 2010. A copy of the Vehicular Circulation Plan is shown in Figure 7. Designated truck routes are shown in Figure 8. Project truck traffic is assumed to use the designated truck route on Riverside Avenue to access the freeway and beyond.

Figure 7. Vehicular Circulation Plan



Source: City of Rialto General Plan Update (2010)

Figure 8. Truck Routes



Source: City of Rialto General Plan Update (2010)

C. Projected Future Traffic

C.1. Project Traffic

C.1.1. Project Trip Generation

The trip generation of the site was estimated using the Institute of Transportation Engineers' (ITE) Trip Generation Manual, 10th Edition, 2017. The land use for "manufacturing" was selected as it best represents the use of the site. With this land use, the total daily trips as well as the peak hour trips are estimated. Because this site is considered a "truck intensive" land use, the project trips were converted into PCEs per the City of Rialto's *Traffic Impact Analysis Guidelines and Requirements*. Forty percent of the trips associated with this site are considered truck trips. The vehicle mix in the PCE calculation is consistent with the City of Rialto's specifications. Again, a factor of 1.5 was used for 2-axle vehicles, 2 for 3-axle vehicles, and 3.0 for 4+axle vehicles. Tables 6 and 7 summarize the project trip generation expected to and from the development per the ITE Trip Generation as well as the conversion of the trip generation into PCE values. Ultimately, the PCE values were used in analysis.

Table 6: Project Trip Generation

Land Use[1]		Quantity	Unit	Daily	AM Peak Hour			PM Peak Hour		
					In	Out	Total	In	Out	Total
Trip Generation Rates				4.006	0.475	0.142	0.617	0.206	0.465	0.671
Manufacturing		189.207[2]	KSF	758	90	27	117	39	88	127
Passenger Vehicles	60%			455	54	16	70	23	53	76
Trucks	40%			303	36	11	47	16	35	51

[1]Source: ITE Trip Generation Manual, 10th Edition
[2]Site plan dated 2/2021 shows a total area of 188,493 SF of all manufacturing components. Quantity used in trip generation remains the same (a higher value) to match scope approved by City of Rialto.

Table 7: Project Trips in Passenger Car Equivalents (PCE)

Vehicle Type	Vehicle Mix[1]	Daily Vehicles	PCE Factor	Daily	AM Peak Hour			PM Peak Hour		
					In	Out	Total	In	Out	Total
Passenger Vehicles	60%	455	1.0	455	54	16	70	23	53	76
2-Axle Trucks	0.8%	6	1.5	9	1	0	1	0	1	2
3-Axle Trucks	11.2%	85	2.0	170	20	6	26	9	20	28
4+ Axle Trucks	28.0%	212	3.0	637	76	23	98	33	74	107
Total Truck PCE Trips				**816**	**97**	**29**	**126**	**42**	**95**	**137**
Total Project PCE Trips				**1,270**	**151**	**45**	**196**	**65**	**147**	**213**

[1]Source: City of Rialto Traffic Impact Analysis Report Guidelines and Requirements, December 2013
Notes: PCE = Passenger Car Equivalent
SF = Square Feet

While the ITE Trip Generation Manual can estimate the number of daily, AM, and PM trips based on building square footage, it is still an estimate. The specific site operations indicate that there will be

75 employees per day and 250 trucks serviced per day. By doubling these trips to represent both entering and exiting trips, the total daily trip generation for the site is 650 trips. Ultimately the ITE Trip Generation was used in analysis as it is the industry standard and a more conservative estimate.

For operational analysis, the development will generate a total of 196 PCE trips (151 trips entering and 45 trips exiting) during the AM peak hour, and a total of 213 trips (65 trips entering and 147 trips exiting) during the PM peak hour.

C.1.2. Trip Distribution and Assignment

Trip distribution assumptions for both passenger vehicles and trucks were developed by taking into account the proposed site use and the routes to and from the freeway for trucks as well as the land-use in the area around the study area. Both vehicular and truck distributions were coordinated with the City of Rialto staff. Separate distribution patterns for passenger vehicles are shown in Figure 9 and trip distribution for trucks are shown in Figure 10. Trip distribution percentages at each study intersection were applied to the project trip generation to determine project trips through each intersection. The project site peak hour trips at the study intersections are shown in Figure 11.

Figure 9. Project Trip Distribution – Passenger Cars

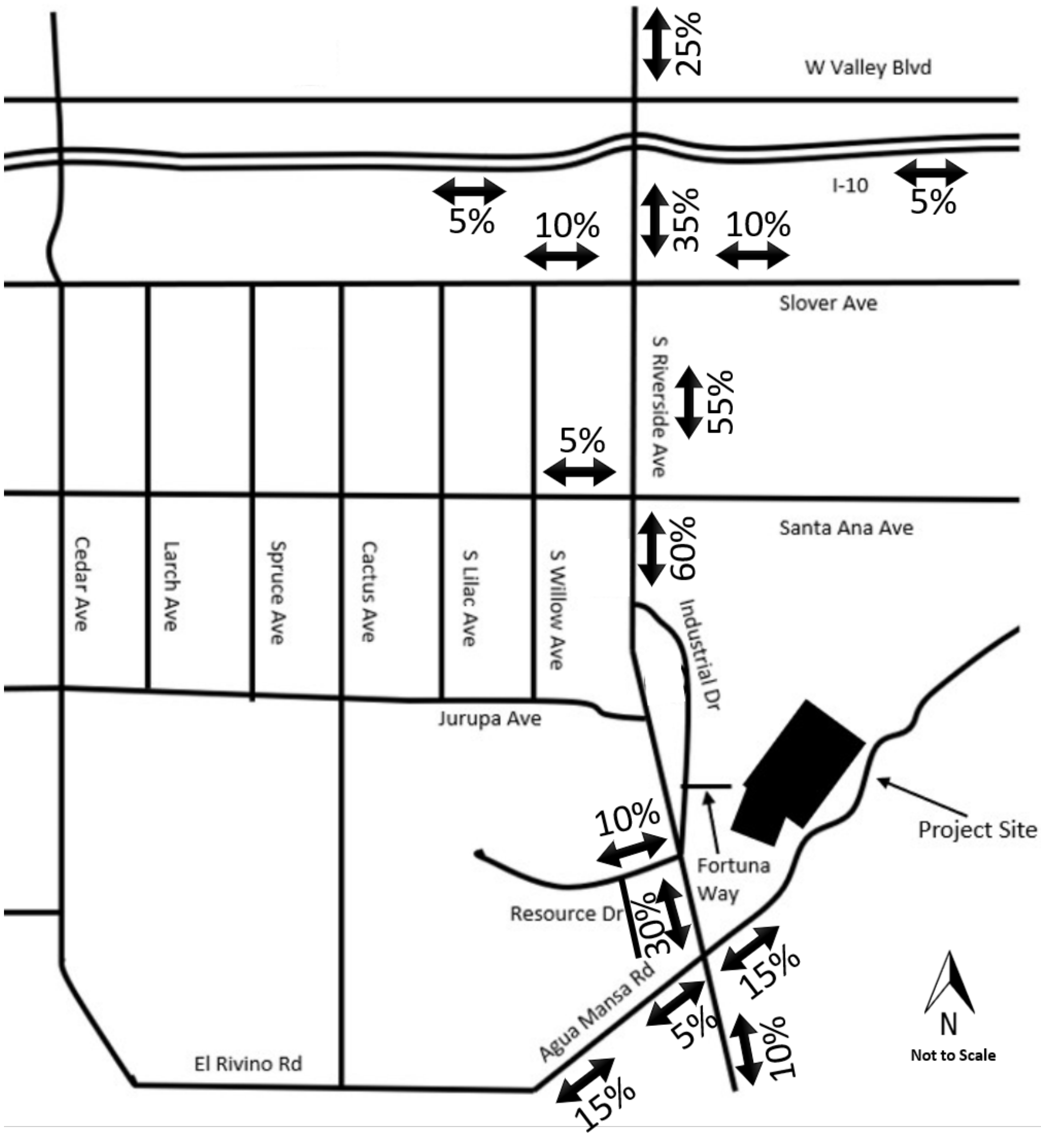


Figure 10. Project Trip Distribution – Trucks

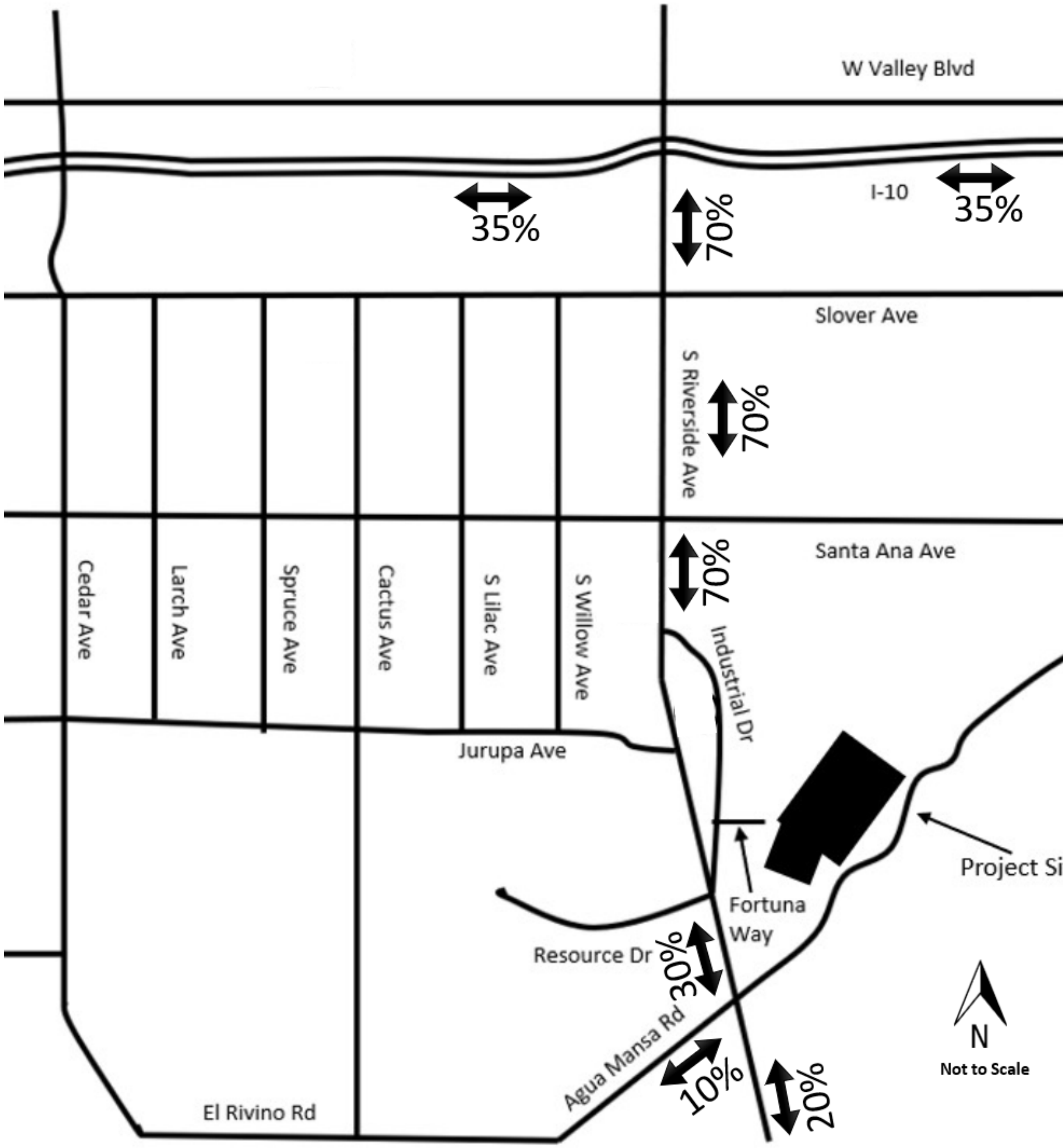
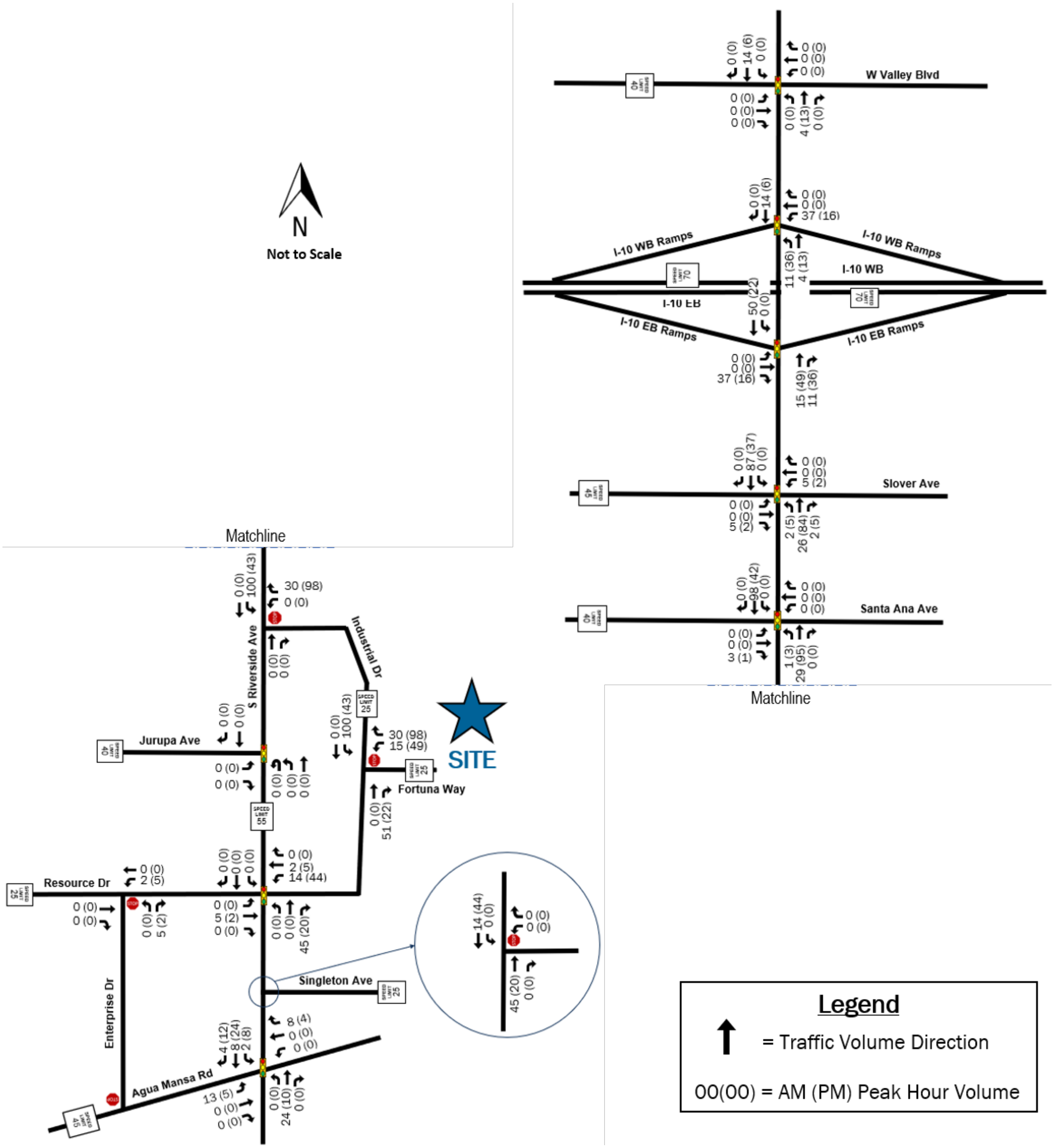


Figure 11. Project Site Trips



C.2. Opening Year 2022 - Existing Plus Growth Plus Project

This scenario portrays the existing network with the ambient growth and the project trips to predict what the operations of the transportation network will be in the opening year of 2022.

C.2.1. Ambient Growth Rate

Analysis of the historic development pattern, changes in nearby traffic volumes, and the anticipated completion of the project informed the development of a growth rate for the study area's traffic. Opening Year is anticipated to be 2022. A compound annual growth rate of 2% per year was established with coordination with the City of Rialto. This rate was applied to the existing 2020 PCE volumes for a period of two-years to account for changes in the background traffic volumes.

C.2.2. Opening Year 2022 - Existing Plus Growth

Peak hour intersection volumes for Opening Year 2022 without project traffic are shown in Figure 12. Intersection Level of Service conditions without project are shown in Table 8. All intersections would operate at LOS E or better.

Daily roadway segment operating conditions for Opening Year 2022 without project Level of Service conditions are shown in Table 9. Like the existing conditions, all roadway segments would operate over capacity with an LOS F.

C.2.3. Opening Year 2022 - Existing Plus Growth Plus Project

Peak hour intersection volumes for Opening Year 2022 with project traffic are shown in Figure 13. Intersection Level of Service conditions with project are shown in Table 8. All intersections are operating with an LOS E or better. The additional project traffic is not significant; therefore, no intersection mitigation is required at this stage.

Daily roadway segment operations for Opening Year 2022 with project Level of Service conditions are shown in Table 9. All roadway segments would operate over capacity with an LOS F; therefore, roadway segment mitigation is required.

Figure 12. Opening Year 2022 - Existing Plus Growth Volumes

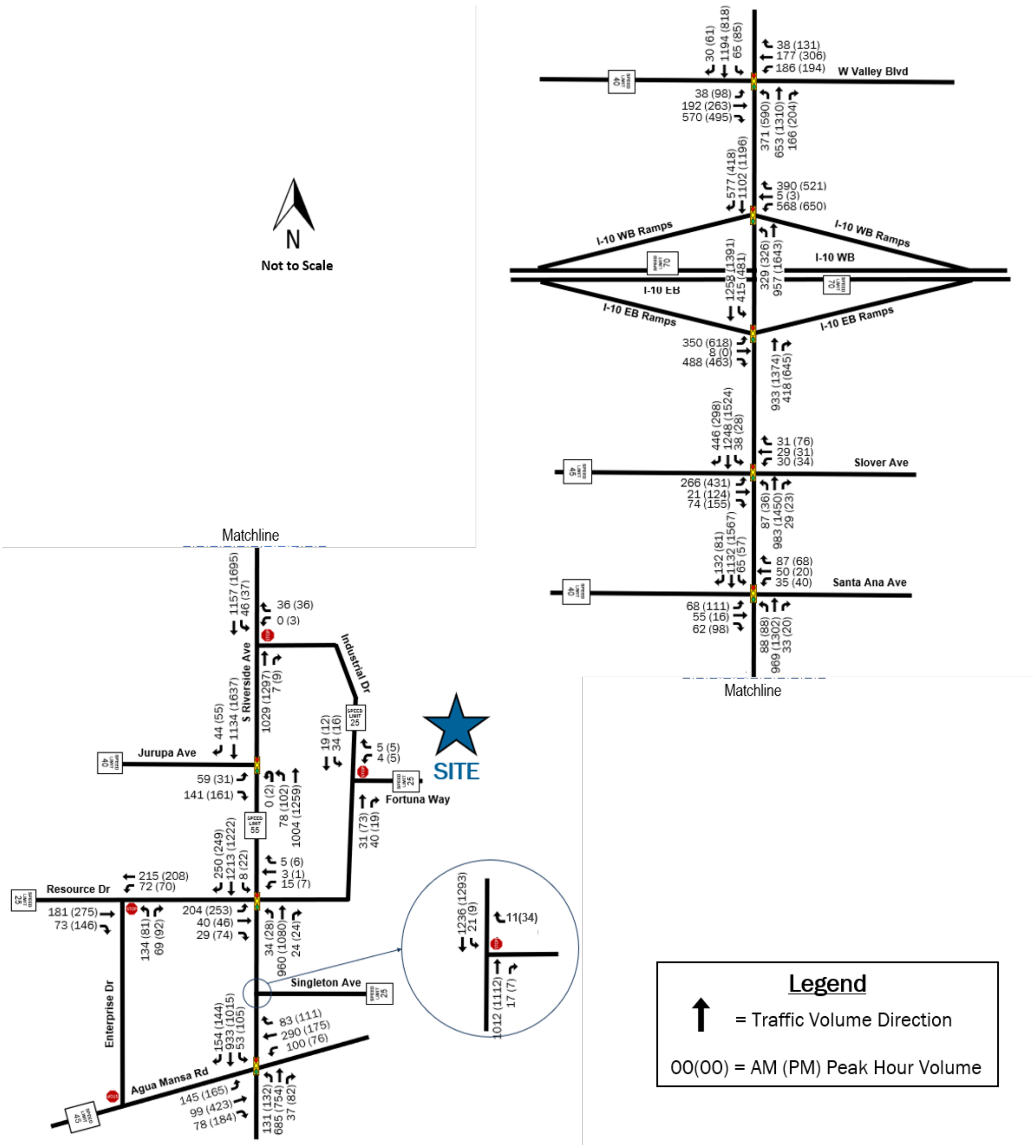


Figure 13. Opening Year 2022 - Existing Plus Growth Plus Project Volumes

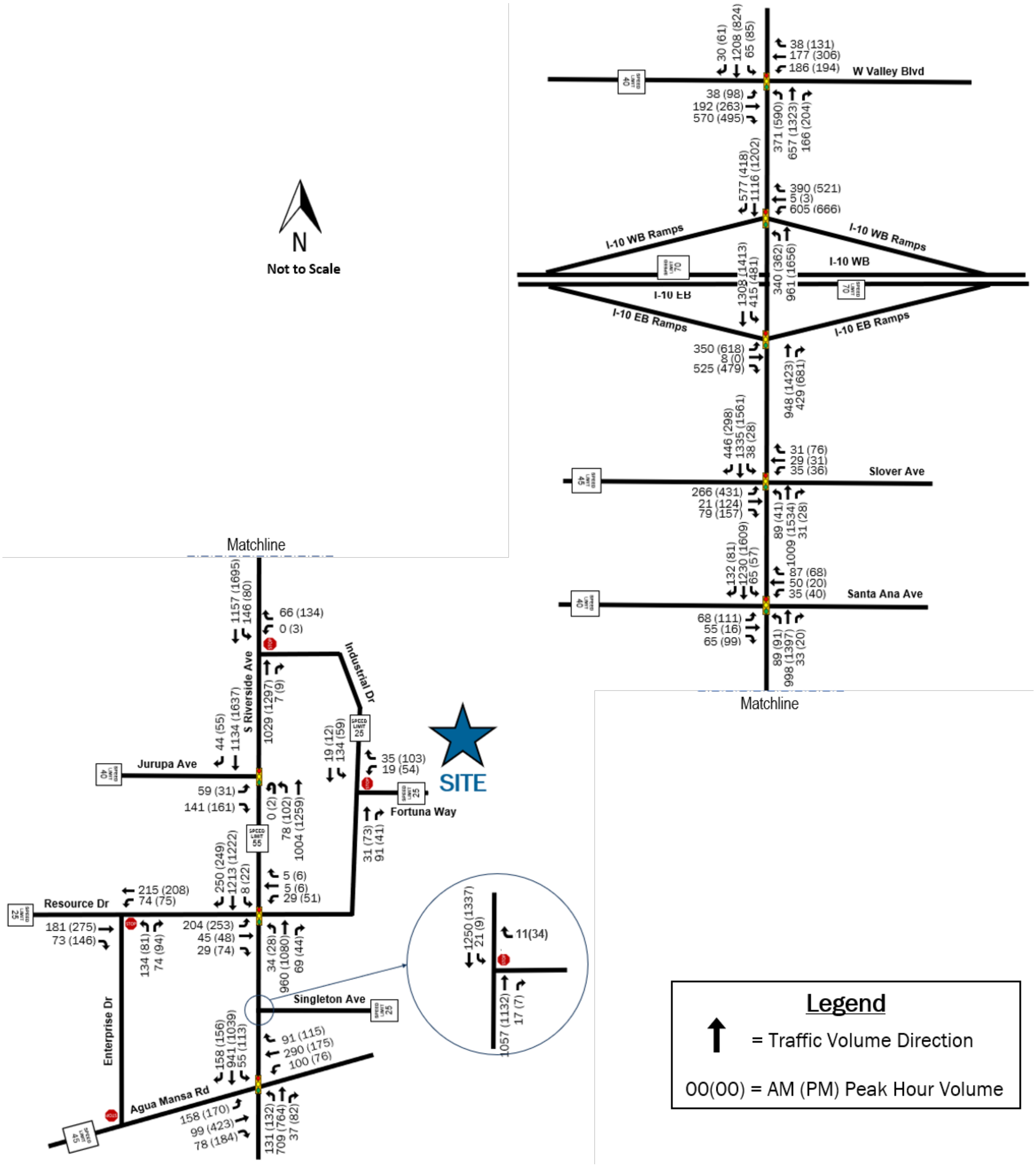


Table 8: Opening Year (2022) Intersection Operations
(Existing + Growth + Project)

	Intersection	Traffic Control	AM Peak Hour						PM Peak Hour					
			Without Project		With Project		Project Impact	Impact Sig?	Without Project		With Project		Project Impact	Impact Sig?
			Delay	LOS	Delay	LOS			Delay	LOS	Delay	LOS		
1	S Riverside Ave & W Valley Blvd	Signal	39.8	D	40.0	D	0.2	No	36.7	D	36.9	D	0.2	No
2	S Riverside Ave & I-10 WB Ramps	Signal	23.3	C	24.5	C	1.2	No	20.8	D	21.6	C	0.8	No
3	S Riverside Ave & I-10 EB Ramps	Signal	25.6	C	27.1	C	1.5	No	39.4	D	43.0	D	3.6	No
4	S Riverside Ave & Slover Ave	Signal	38.8	D	40.8	D	2	No	75.0	D	76.8	E	1.8	No
5	S Riverside Ave & Santa Ana Ave	Signal	19.8	B	22.2	C	2.4	No	24.7	C	26.5	C	1.8	No
6	S Riverside Ave & Industrial Dr	Stop	15.5	C	16.5	C	1	No	19.2	C	23.8	C	4.6	No
7	S Riverside Ave & Jurupa Ave	Signal	10.4	B	10.4	B	0	No	14.0	B	14.0	B	0	No
8	S Riverside Ave & Resource Dr/Industrial Dr	Signal	22.6	C	18.3	B	-4.3	No	18.2	B	17.6	B	-0.6	No
9	S Riverside Ave & Singleton Dr	Stop	12.3	B	12.5	B	0.2	No	13.2	B	13.4	B	0.2	No
10	S Riverside Ave & Agua Mansa Rd	Signal	28.2	C	29.2	C	1	No	34.8	C	35.1	D	0.3	No
11	Industrial Dr & Fortuna Way	Stop	9.5	A	10.7	B	1.2	No	9.5	A	11.0	B	1.5	No
12	Resource Dr & Enterprise Dr	Stop	13.9	B	14.0	B	0.1	No	13.8	B	13.9	B	0.1	No

Notes: BOLD and shaded values indicate intersections operating at LOS F
At signalized intersections, delay refers to the average control delay for the entire intersection, measured in seconds/vehicle
At stop-controlled intersections, delay refers to the average vehicle delay on the worst (highest delay) movement
Delay values are based on methodology outlines in the 6th Edition Highway Capacity Manual.

Table 9: Opening Year (2022) Roadway Segment Operations
(Existing + Growth + Project)

Roadway	Segment	LOS E Capacity	ADT in PCEs				LOS E or Better?
			Existing (2020)	Without Project	Project Traffic	With Project	
S Riverside Ave	I-10 WB ramps to I-10 EB ramps	54,900	59,410	61,810	730	62,540	No
	I-10 EB ramps to Slover Ave	36,400	56,753	59,046	730	59,776	No
	Slover Ave to Santa Ana Ave	36,400	51,250	53,321	821	54,142	No
	Santa Ana Ave to Industrial Dr	36,400	65,161	67,794	844	68,638	No
	Resource Dr to Agua Mansa Rd	36,400	53,143	55,290	381	55,671	No

Notes: LOS = Level of Service
ADT = Average Daily Traffic
PCE = Passenger Car Equivalent

C.3. Cumulative Conditions (Existing Plus Growth Plus Cumulative Projects)

This scenario portrays the existing network with the ambient growth and the cumulative project trips to predict the operations of the transportation network in the opening year of 2022 if all development under consideration at this time were fully operational.

C.3.1. Ambient Growth Rate

As discussed in section C.2.1, a compound annual growth rate of 2%, coordinated with the City of Rialto, has been applied to the existing traffic volumes for a period of two-years to account for changes in the background traffic volumes.

C.3.2. Cumulative Projects

Cumulative projects (approved and pending approval) are added to the Existing Plus Growth traffic volumes in this scenario. Cumulative projects consist of any project that has been approved and is not yet completed and projects that are in various stages of application and approval processes. The locations of the cumulative projects are shown in Figure 14. A summary of Cumulative Projects in the project vicinity and their trip generation is shown in Table 10. Cumulative project traffic volumes at the studied intersections are shown in Figure 15.

C.3.3. Cumulative Projects Trip Generation

Trip generation information for the Cumulative Projects was derived either from approved traffic studies, City of Rialto Traffic Commission Meeting minutes or ITE Trip generation rates for similar types of development. Project information and trip generation assumptions for Cumulative Projects are provided in Appendix G.

Figure 14. Location of Cumulative Projects

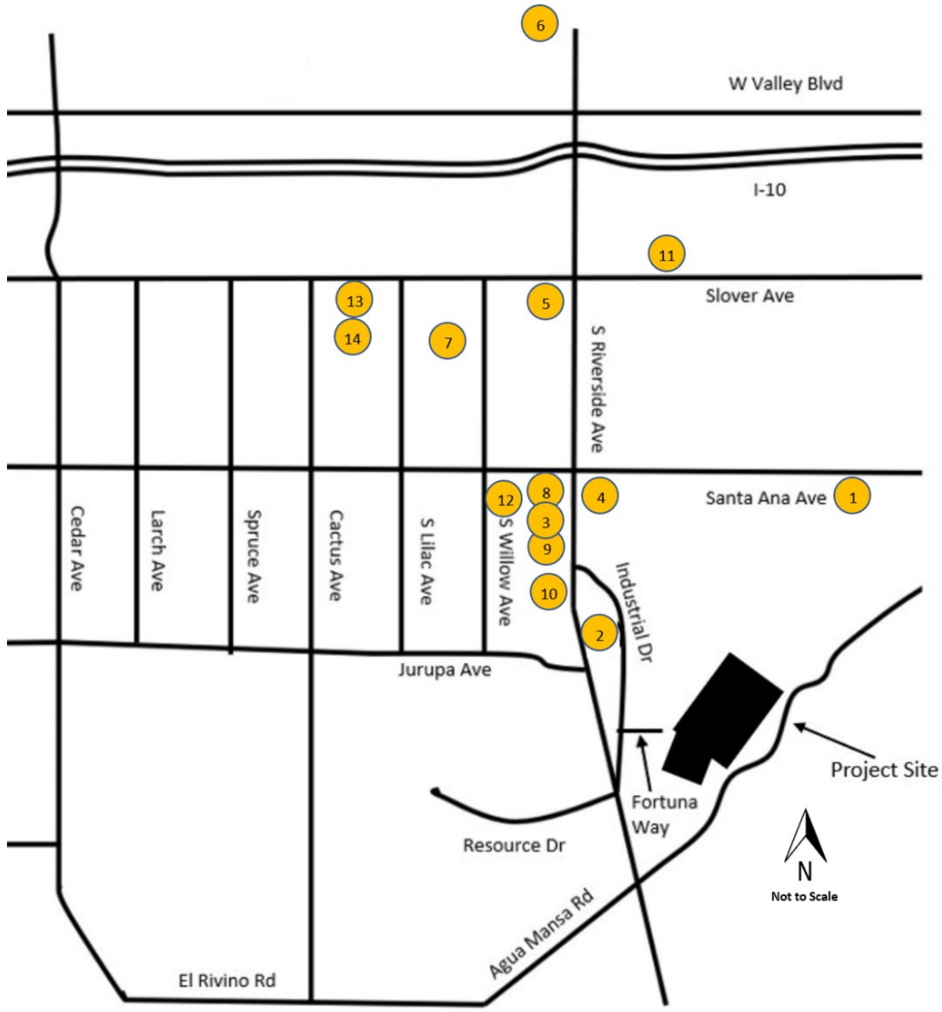


Table 10: Summary of Cumulative Projects Trip Generation

Project #	Land Use	Quantity	Units	Source	Trip Generation Estimates						
					Daily	AM Peak Hour			PM Peak Hour		
						In	Out	Total	In	Out	Total
1	South of Santa Ana Ave, East of Riverside Ave			ITE							
	Warehouse	370,000	TSF		630	54	16	70	19	53	72
	Passenger Cars		PCE		423	51	12	63	13	48	61
	Truck Trips				207	3	4	7	6	5	11
	2-axle	1.5	PCE		50	1	1	2	1	1	3
	3-axle	2.0	PCE		87	1	2	3	3	2	5
	4+ axle	3.0	PCE		391	6	8	13	11	9	21
	Net Truck Trips (PCE)				528	8	10	18	15	13	28
	Total Net Trips (PCE)				**951**	**59**	**22**	**81**	**28**	**61**	**89**
2	SEC of Riverside Ave and Industrial Dr.										
	Trucking	3.6	AC								
	Total Net Trips (PCE)				**927**	**35**	**50**	**85**	**33**	**40**	**73**
3	NWC of Riverside Ave and Industrial Dr.			TIS							
	Semi-Truck Drop/Storage Lot	3.3	Acres								
	Total Net Trips (PCE)				**850**	**32**	**46**	**78**	**30**	**37**	**67**
4	SEC of Riverside Ave and Santa Ana Ave.			TIS							
	Super Convenient Market/Gas Station/Diesel Statio										
	Total Net Trips (PCE)				**3,803**	**232**	**231**	**463**	**190**	**189**	**379**
5	SWC of Riverside Ave and Slover Ave.			TIS							
	Fast Food w/Drive Thru										
	Total Net Trips (PCE)				**1,732**	**50**	**48**	**98**	**63**	**58**	**121**
6	Valley/Willow Warehouse			ITE							
	Warehouse	492.41	TSF		824	65	19	84	23	64	87
	Passenger Cars		PCE		551	60	14	74	15	57	72
	Truck Trips				273	5	5	10	8	7	15
	2-axle	1.5	PCE		66	1	1	2	2	2	4
	3-axle	2.0	PCE		115	2	2	4	3	3	6
	4+ axle	3.0	PCE		516	9	9	19	15	13	28
	Net Truck Trips (PCE)				696	13	13	26	20	18	38
	Total Net Trips (PCE)				**1,247**	**73**	**27**	**100**	**35**	**75**	**110**
7	Old Dominion Expansion			TIS							
	Parking Lot (407 Spaces)										
	Total Net Trips (PCE)				**375**	**21**	**39**	**60**	**37**	**18**	**55**
8	SC Fuels			TIS							
	Fuel Storage/Service										
	Total Net Trips (PCE)				**1,862**	**169**	**160**	**329**	**177**	**194**	**371**

Table 10: Summary of Cumulative Projects Trip Generation (Cont.)

Project #	Land Use	Quantity	Units	Source	Trip Generation Estimates						
					Daily	AM Peak Hour			PM Peak Hour		
						In	Out	Total	In	Out	Total
9	Lynn Trucking			ITE							
	Truck Parking Yard (PCE)	3.07	AC		791	30	43	73	28	34	62
	Car Wash/Repair Trips	8.827	TSF		156	5	4	9	7	7	14
	Car Wash/Repair PCE				468	15	12	27	21	21	42
	Total PCE Trips				**1,259**	**45**	**55**	**100**	**49**	**55**	**104**
10	Riverside Pallet Yard			ITE							
	Pallet Yard	3.58	AC								
	Total PCE Trips				**922**	**35**	**50**	**85**	**33**	**40**	**73**
11	Onyx Paving			TIS							
	Contractor's Yard										
	Total Net Trips (PCE)				**80**	**7**	**33**	**40**	**33**	**7**	**40**
12	Bakery Addition			ITE							
	Bakery	14,000	TSF		111	**9**	**1**	**10**	**1**	**8**	**9**
	Auto Trips				107	9	1	10	1	8	9
	Truck Trips				4	0	0	0	0	0	0
	Truck PCE Trips				8	0	0	0	0	0	0
	Total PCE Trips				**874**	**9**	**1**	**10**	**1**	**8**	**9**
13	Flyers Energy Addition			ITE							
	Warehouse	9.35	TSF		**60**	**20**	**6**	**26**	**8**	**21**	**29**
	Auto Trips				47	20	6	26	8	21	29
	Truck Trips				13	0	0	0	0	0	0
	Truck PCE Trips				39	0	0	0	0	0	0
	Total PCE Trips				**86**	**20**	**6**	**26**	**8**	**21**	**29**
14	Lilac Avenue Truck Terminal										
	Trucking	9.44	AC								
	Total PCE Trips				**2,432**	**92**	**132**	**223**	**86**	**106**	**192**

C.3.5. Cumulative Projects Trip Distribution and Assignment.

Trip distribution assumptions for the cumulative projects was derived from either approved traffic studies or developed by NV5 if the studies were not available. Trip distribution assumptions for Cumulative Projects are provided in Appendix G. Cumulative project trips are illustrated in Figure 15.

C.3.6. Opening Year 2022 - Cumulative Without Project Conditions

Peak hour intersection volumes for Opening Year 2022 with cumulative projects but without the subject project are shown in Figure 16. Intersection Level of Service conditions without the subject project are shown in Table 11. All intersections would operate at LOS E or better except S Riverside Avenue at Slover Avenue, S Riverside Avenue at Santa Ana Avenue, and S Riverside Avenue at the I-10 EB Ramps which would operate at LOS F during at least one peak hour in this scenario.

Figure 15: Cumulative Project Traffic Volumes

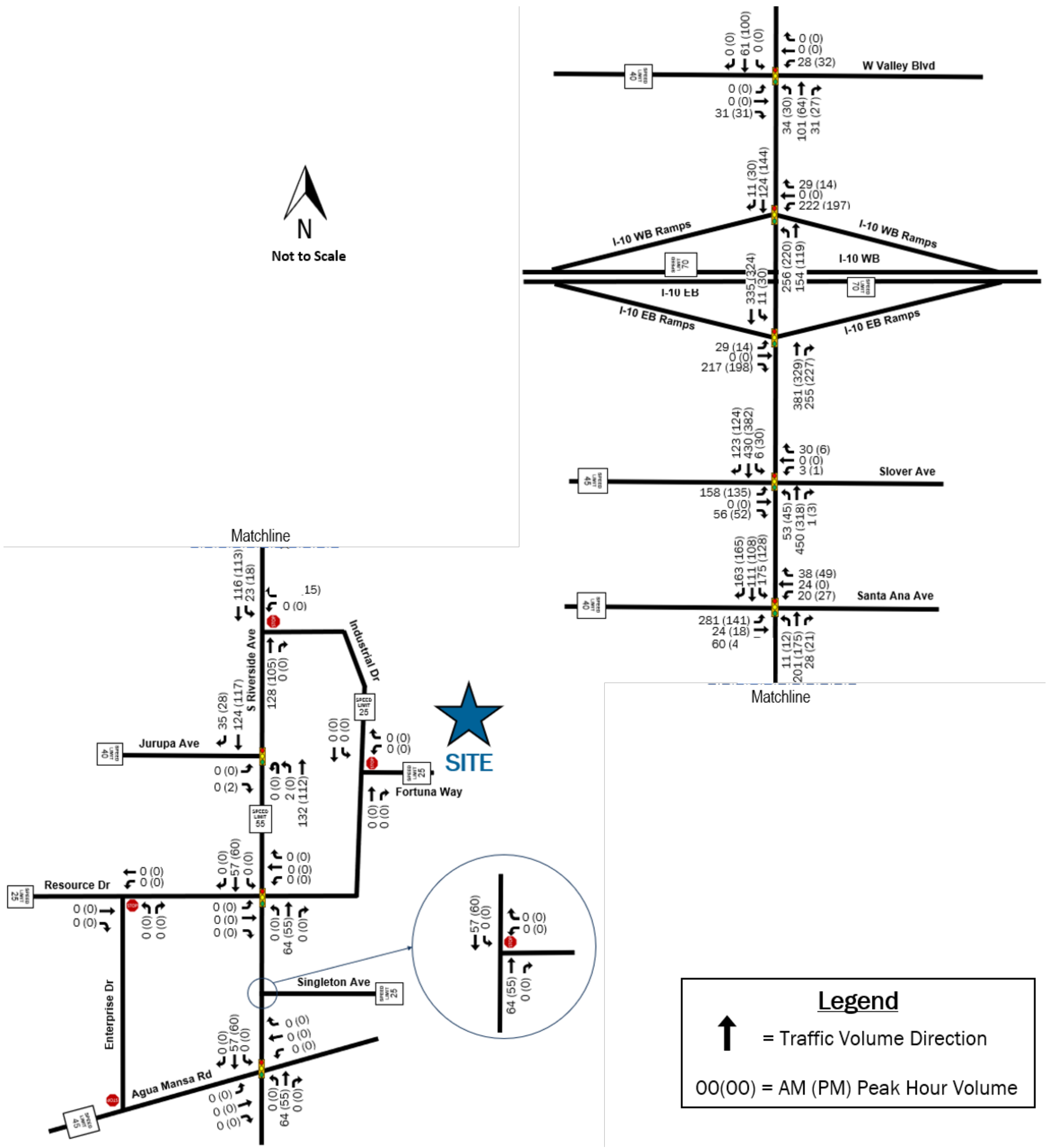
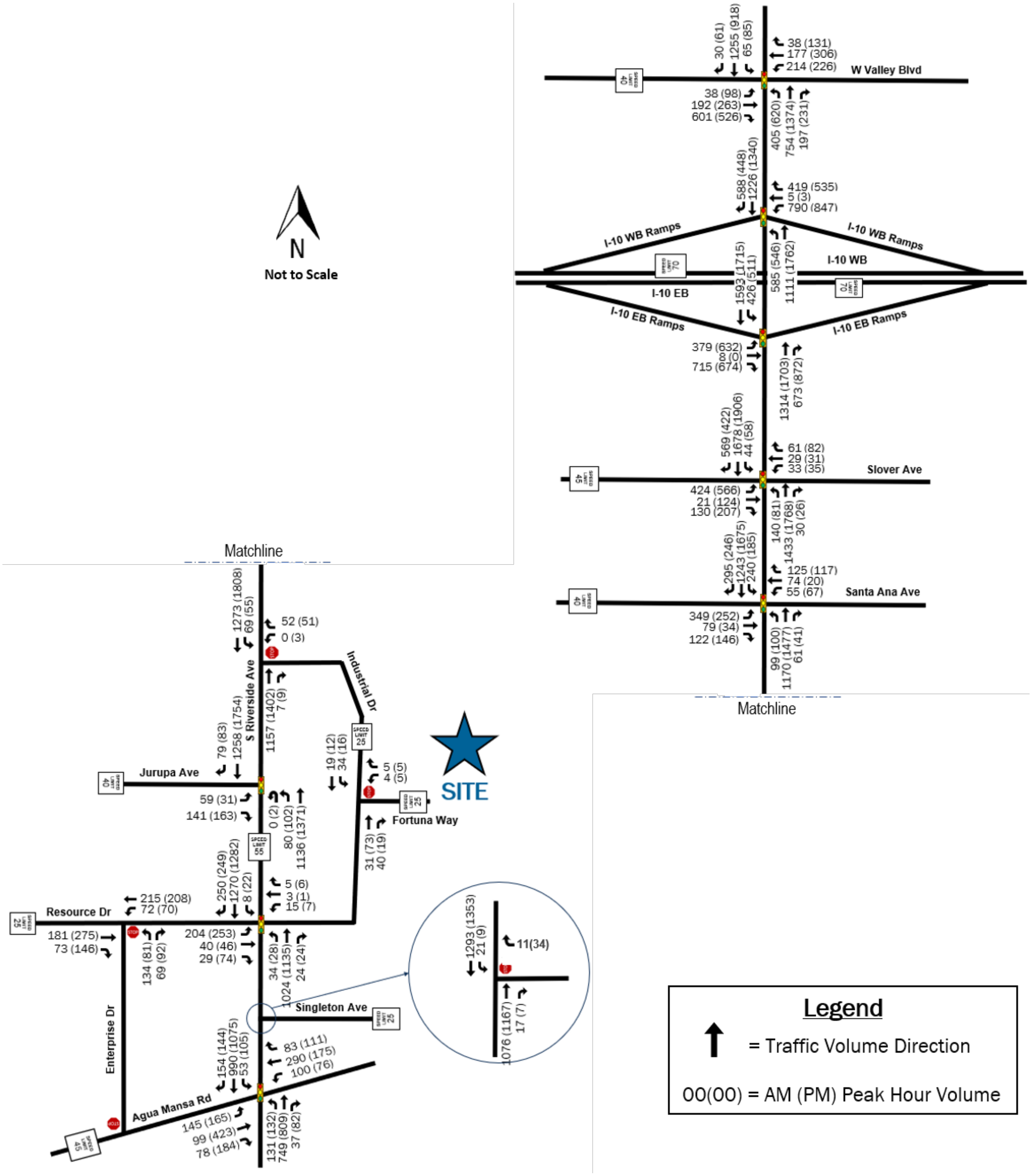


Figure 16. Opening Year 2022 Cumulative - Without Project



Daily roadway segment operations for Opening Year 2022 with cumulative projects but without the subject project Level of Service conditions are shown in Table 12. As in previous scenarios, all roadway segments operate over capacity with an LOS F and are beyond the acceptable LOS per the General Plan.

C.3.7. Opening Year 2022 Cumulative - With Project Conditions

Peak hour intersection volumes for Opening Year 2022 with cumulative projects and the subject project are shown in Figure 17. Intersection Level of Service conditions with project are shown in Table 11. All intersections would operate at LOS E or better except S Riverside Avenue at Slover Avenue, S Riverside Avenue at Santa Ana Avenue, and S Riverside Avenue at the I-10 EB Ramps, which would operate at LOS F during at least one peak hour in this scenario.

Daily roadway segment operations for Opening Year 2022 with cumulative projects and the subject project volumes Level of Service conditions are shown in Table 12. As in previous scenarios, all roadway segments operate over capacity with an LOS F and are beyond the acceptable LOS per the General Plan.

Figure 17. Opening Year 2022 Cumulative – With Project

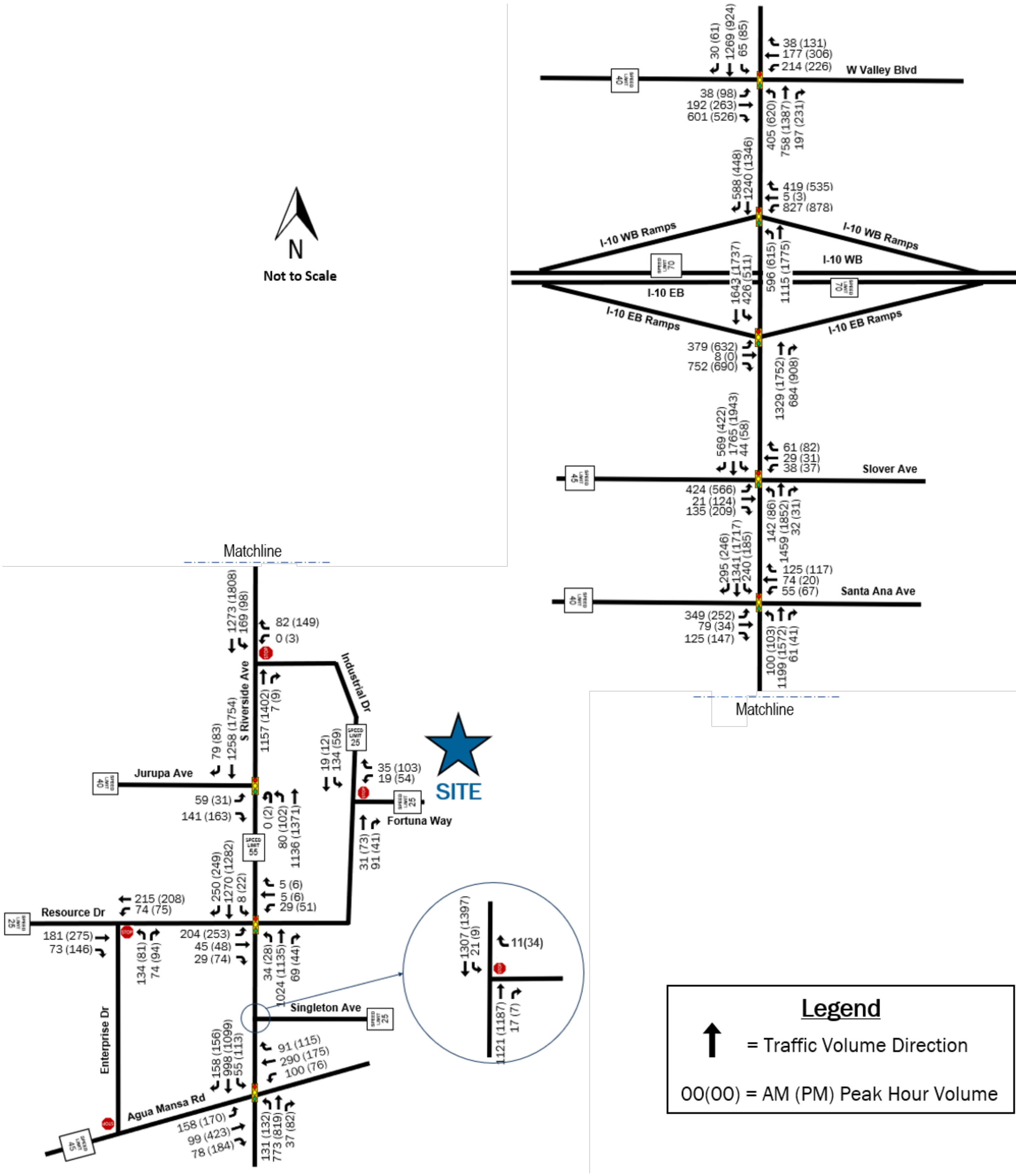


Table 11: Opening Year (2022) Intersection Operations with Subject & Cumulative Projects
(Existing + Growth + Cumulative + Project)

	Intersection	Traffic Control	AM Peak Hour						PM Peak Hour					
			Without Project		With Project		Project Impact	Impact Sig?	Without Project		With Project		Project Impact	Impact Sig?
			Delay	LOS	Delay	LOS			Delay	LOS	Delay	LOS		
1	S Riverside Ave & W Valley Blvd	Signal	44.7	D	44.9	D	0.2	No	41.9	D	41.6	D	-0.3	No
2	S Riverside Ave & I-10 WB Ramps	Signal	45.7	D	49.6	D	3.9	No	31.1	C	34.9	C	3.8	No
3	S Riverside Ave & I-10 EB Ramps	Signal	62.0	E	65.4	E	3.4	Yes	**85.4**	**F**	**93.6**	**F**	11.2	Yes
4	S Riverside Ave & Slover Ave	Signal	**147.3**	**F**	**150.4**	**F**	3.1	Yes	198.8	F	200.7	F	1.9	No
5	S Riverside Ave & Santa Ana Ave	Signal	**159.2**	**F**	**168.0**	**F**	8.8	Yes	**84.3**	**F**	**92.7**	**F**	8.4	Yes
6	S Riverside Ave & Industrial Dr	Stop	17.6	C	19.0	C	1.4	No	21.2	C	28.9	D	7.7	No
7	S Riverside Ave & Jurupa Ave	Signal	17.0	B	17.0	B	0	No	15.8	B	15.8	B	0	No
8	S Riverside Ave & Resource Dr/Industrial Dr	Signal	18.3	B	18.6	B	0.3	No	19.0	B	17.7	B	-1.3	No
9	S Riverside Ave & Singleton Dr	Stop	12.7	B	12.9	B	0.2	No	13.6	B	13.8	B	0.2	No
10	S Riverside Ave & Agua Mansa Rd	Signal	27.8	C	29.1	C	1.3	No	35.1	D	35.5	D	0.4	No
11	Industrial Dr & Fortuna Way	Stop	9.5	A	10.7	A	1.2	No	9.5	A	11.0	B	1.5	No
12	Resource Dr & Enterprise Dr	Stop	13.9	B	14.0	B	0.1	No	13.8	B	13.9	B	0.1	No

Notes: **BOLD** and shaded values indicate intersections operating at LOS F
At signalized intersections, delay refers to the average control delay for the entire intersection, measured in seconds/vehicle
At stop-controlled intersections, delay refers to the average vehicle delay on the worst (highest delay) movement
Delay values are based on methodology outlines in the 6th Edition Highway Capacity Manual.

Table 12: Opening Year (2022) Roadway Segment Operations with Subject & Cumulative Projects
(Existing + Growth + Cumulative + Project)

Roadway	Segment	LOS E Capacity	ADT in PCEs				LOS E or Better?
			Existing (2020)	Without Project	Project Traffic	With Project	
S Riverside Ave	I-10 WB ramps to I-10 EB ramps	54,900	59,410	68,771	730	69,501	No
	I-10 EB ramps to Slover Ave	36,400	56,753	71,218	730	71,948	No
	Slover Ave to Santa Ana Ave	36,400	51,250	63,420	821	64,241	No
	Santa Ana Ave to Industrial Dr	36,400	65,161	71,580	844	2,424	No
	Resource Dr to Agua Mansa Rd	36,400	53,143	58,519	381	8,900	No

Notes: Daily roadway counts were collected in 2018. Counts were increased by 2%/year to bring the existing ADT to 2022.
LOS = Level of Service
ADT = Average Daily Traffic
PCE = Passenger Car Equivalent

D. Vehicle-Miles Traveled (VMT)

As part of CEQA regulations, a VMT analysis has been conducted. San Bernardino County guidelines were utilized per direction of City of Rialto personnel. The site was screened using the San Bernardino County guidelines and was found to warrant the VMT analysis. The average VMT for the San Bernardino County area was found to be 18.98. With the project included, the VMT was calculated to be 21.18. Per San Bernardino County Guidelines, any project that causes an increase in VMT must be mitigated to reduce the VMT by 4% below the regional average. This means that the project VMT must be no more than 18.22.

The VMT analysis includes mitigation measures to reduce the site's VMT and therefore be compliant of CEQA regulations. Table 13 summarizes the proposed VMT reduction strategies for the subject project as well as the final calculated VMT with mitigations. Details regarding the analysis and all supporting documentation is provided under a separate cover.

Table 13: VMT Analysis Results

Reduction Strategy		Range of Effectiveness	VMT Reduction	Combined VMT Reduction	Results
Commute Trip Reduction (CAPCOA)					
TRT-1	Implement Commute Trip Reduction Marketing	0.8 - 6.2%	4.16%	8.8%	
TRT-3	Provide Ride Sharing Program	1-15%	5.0%	8.8%	-1.86
TRT-8	Preferential Parking Permit Program	N/A	N/A	8.8%	
Baseline 2022 Conditions w/ Project					21.18
Baseline 2022 Conditions w/ Project (CAPCOA Reduction)					19.32
Local Hiring Reduction (25%)					2.32
Baseline 2022 Conditions w/ Project (Local Hiring and CAPCOA Strategies)					17.0

E. Mitigation Measures

E.1. Intersection Improvements

Based on the City of Rialto's *Traffic Impact Analysis Report Guidelines*, the proposed project causes significant impacts at three intersections within the study area under the cumulative conditions:

- S Riverside Avenue @ I-10 EB Ramps (PM Peak Hour)
- S Riverside Avenue @ Slover Avenue (AM Peak Hour)
- S Riverside Avenue @ Santa Ana Avenue (AM & PM Peak Hour)

All intersections along S Riverside Avenue would operate at LOS E or better and all other intersections operate at LOS D or better with the project but without other cumulative projects. Under the Cumulative conditions, S Riverside Avenue's intersections at the I-10 EB Ramps, Slover Avenue, and Santa Ana Avenue would fall to LOS F.

The City of Rialto's Development Impact Fee (DIF) Nexus Study indicates improvements are funded through all significantly impacted intersections along S Riverside Avenue as part of the overall widening of Riverside Avenue between the I-10 eastbound ramps and Agua Mansa Road. Specific improvements are also funded for the intersection at Slover Avenue. There are no specific intersection improvements slated for S Riverside Avenue at I-10 Eastbound Ramps and Santa Ana Avenue. The widening and additional improvements at Slover Avenue would address the deficiencies at the intersections impacted under the cumulative conditions. Because the widening of S Riverside Avenue would increase capacity of the roadway and intrinsically improve operations at the other two significantly impacted intersections, no additional intersection improvements are identified in this report. However, with an overall roadway widening, there are intersection-specific improvements (i.e. signal modification). The cost associated with these intersection improvements is expected to be of similar scope as that which is summarized in the cost estimate for S Riverside Avenue at Slover Avenue. Because these intersections are still considered significantly impacted by the subject project, the cost estimate utilized for S Riverside Avenue at Slover Avenue was also utilized to estimate intersection-specific improvements for S Riverside Avenue at I-10 Eastbound Ramps and at Santa Ana Avenue.

E.2. Roadway Improvements

Based on the City of Rialto's *Traffic Impact Analysis Report Guidelines*, LOS threshold values for roadway segments, the following segments are currently, or will exceed their daily roadway capacities:

- S Riverside Ave: I-10 WB ramps to I-10 EB ramps
- S Riverside Ave: I-10 EB ramps to Slover Avenue
- S Riverside Ave: Slover Avenue to Santa Ana Ave
- S Riverside Ave: Santa Ana Ave to Industrial Dr
- S Riverside Ave: Resource Dr to Agua Mansa Rd

A Peak Hour Link Analysis (PHLA) was conducted for all five roadway segments since they all exceed their daily capacities. This analysis is conducted to determine if there is enough hourly capacity during the am and pm peak hours. A capacity of 1,600 PCE per lane per hour was assumed based on roadway characteristics as established by the Highway Capacity Manual (HCM) 6th Edition. The existing number of lanes was used to estimate link capacity, and the total approach volume from the Opening Year Plus Project Plus Cumulative Traffic scenario was compared to the capacity. Table 14 summarizes the findings of the PHLA for existing number of lanes and the scenario with the highest traffic volume—Opening Year Plus Project Plus Cumulative Traffic.

Table 14: Opening Year (2022) Peak Hour Link Analysis (PHLA) Summary
(Existing + Growth + Cumulative + Project)

Roadway	Segment	# of lanes	Capacity[1]	AM Peak Hour			PM Peak Hour		
				Volume[2] (North End)	Volume[2] (South End)	V/C	Volume[2] (North End)	Volume[2] (South End)	V/C
S Riverside Avenue	I-10 WB ramps to I-10 EB ramps	6	9,600	3,778	3,777	0.39	4,614	4,632	0.48
	I-10 EB ramps to Slover Ave	5	8,000	4,408	4,322	0.55	5,087	3,081	0.51
	Slover Ave to Santa Ana Ave	4	6,400	3,645	3,549	0.56	4,158	4,089	0.64
	Santa Ana Ave to Industrial Dr	4	6,400	2,881	2,681	0.43	3,647	3,457	0.56
	Resource Dr to Agua Mansa Rd	4	6,400	2,485	2,233	0.37	2,614	2,472	0.40

[1]1,600 vehicles/hr/ln is assumed
[2]Volume shown in PCEs from Opening Year Plus Project Plus Cumulative Traffic

S Riverside Ave: I-10 WB ramps to I-10 EB ramps: This segment is currently six lanes with additional turn lanes. According to the General Plan, this segment is classified as Modified Major Arterial II. According to the San Bernardino County Transportation Authority (SBCTA) Transportation Management Plan (CMP), the interchange of I-10 at Riverside Dr was recently widened. No further widening is anticipated based on the General Plan and the City of Rialto Development Impact Fee (DIF) Nexus Study. The PHLA indicates that this segment would operate below a volume-to-capacity ratio of 1.0 in Opening Year Plus Project Plus Cumulative Traffic conditions. This means that the link will function adequately at peak hours and that the intersections at either end of the roadway segment are driving the operations of the segment. Therefore, no mitigations are recommended for this segment.

S Riverside Ave: I-10 EB ramps to Agua Mansa Rd: These segments are currently five and four lanes with additional turn lanes near intersections. According to the General Plan, these segments are classified as Modified Major Arterial II. According to the San Bernardino County Transportation Authority (SBCTA) Transportation Management Plan (CMP), Riverside Avenue between the I-10 eastbound ramps and Agua Mansa Road will be widened from four and five lanes to six lanes and will be classified as an arterial with a 120' cross section. The total cost of this widening is funded by transportation impact fees by the City of Rialto and other jurisdictions in which this roadway is in the sphere of influence. The PHLA indicates that this segment would operate below a volume-to-capacity ratio of 1.0 in Opening Year Plus Project Plus Cumulative Traffic conditions. This means that the link will function adequately at peak hours and that the intersections at either end are driving the operations of the segment. The cost estimate associated for this widening was utilized to calculate the subject projects fair-share cost.

F. Findings and Recommendations

F.1. Programed Improvements

Mitigation is proposed to widen Riverside Avenue between I-10 eastbound ramps and Agua Mansa Road in accordance with the City of Rialto's General Plan. This improvement is listed in the City of Rialto's Development Impact Fee (DIF) Nexus Study and is to be funded via transportation impact fees levied by the City of Rialto. Table 15 summarizes the analysis results for the intersections that are expected to operate at LOS F in the opening year with the project and cumulative traffic compared to the operations of these intersections with the proposed improvements per the Nexus Study. With these mitigation measures, LOS is maintained in accordance with the City of Rialto General Plan. These intersections are also those significantly impacted according to City of Rialto's *Traffic Impact Analysis Report Guidelines.*

Table 15: Opening Year (2022) Intersection Operations with Programmed Improvements
(Existing + Growth + Cumulative + Project)

Intersection		AM Peak Hour				PM Peak Hour			
		Without		With		Without		With	
		Improvement				Improvement			
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
3	S Riverside Avenue at I-10 Eastbound Ramps	65.4	E	54.2	D	**93.6**	**F**	72.5	E
4	S Riverside Avenue at Slover Avenue	**150.4**	**F**	24.2	C	**200.7**	**F**	40.2	D
5	S Riverside Avenue at Santa Ana Avenue	**168.0**	**F**	47.8	D	**92.7**	**F**	28.4	C

Notes: **Bold** and shaded values indicate intersections operating at LOS F
Delay refers to the average control delay for the entire intersection, measured in seconds per vehicle
Delay values are based on methodology outlined in the 6th Edition Highway Capacity Manual

The widening of S Riverside Avenue per the General Plan adds one lane in each direction for a total of six lanes. Table 16 compares the volumes of the Opening Year Plus Projects Plus Cumulative Traffic and compares it to the updated LOS E threshold of the widened roadway. Even with the widening, LOS E is not maintained. This is remedied by PHLA discussed above.

Table 16: Opening Year (2022) Roadway Segment Operations with Programed Improvements
(Existing + Growth + Cumulative + Project)

Roadway	Segment	LOS E Capacity[1]	ADT in PCEs			LOS E or Better?
			Without Project	Project Traffic	With Project	
S Riverside Avenue	I-10 WB ramps to I-10 EB ramps	54,900	68,771	730	69,501	No
	I-10 EB ramps to Slover Ave	54,900	71,218	730	71,948	No
	Slover Ave to Santa Ana Ave	54,900	63,420	821	64,241	No
	Santa Ana Ave to Industrial Dr	54,900	71,580	844	72,424	No
	Resource Dr to Agua Mansa Rd	54,900	58,519	381	58,900	No

[1]With programed improvements
Notes: LOS = Level of Service
ADT = Average Daily Traffic
PCE = Passenger Car Equivalent

F.2. Traffic Signal Warrant Analysis

No stop-controlled intersections within the study area are shown as proposed signals in the General Plan. Nevertheless, signal warrant analyses, based on the cumulative build condition, for the four stop-controlled intersections in the study area are included in Appendix H. Apart from the intersection of S Riverside Avenue and Industrial Drive, none of these intersections meet any warrants for the consideration of a traffic signal. The Industrial Drive intersection meets the Peak Hour Warrant (#3) during the evening peak hour, but with right-turning traffic from Industrial Drive. It would also meet the Peak Hour Warrant with the southbound left turning traffic considered the minor movement and the northbound traffic considered the major movement during the morning peak hour. The same is true for Warrants 1 (Eight-Hour Vehicular Volume) and 2 (Four-Hour Vehicular Volume) during the peak hours. Condition A (Minimum Vehicular Volumes) of Warrant 1 would be met during both hours for which data is available as would Warrant 2. However, delays for both the traffic exiting and turning left onto Industrial Drive do not exceed and average of 29 seconds/vehicle and the volume to capacity ratio would be less than 0.51 during peak hours under the cumulative build conditions, well within acceptable ranges. Approval of a traffic signal at this location is not anticipated due in part to the small amount of traffic turning left from Industrial Drive and the option for that traffic to access S. Riverside Avenue via the existing signalized intersection at Resource Drive (intersection 8).

F.3. Site Circulation

Vehicular access to the project site will be via two driveways in the col-de-sac of Fortuna Way.

- Driveway 1 will be enter-only and provide access to the entire site. All vehicles will enter via Driveway 1.
- Driveway 2 will be exit-only.
- Driveways 1 and 2 will be 26’ wide.

The two driveways are located at the end of a cul-de-sac and act as an extension of Fortuna Way. The cumulative with project intersection analysis indicates that both driveways will operate at an acceptable Level of Service during both peak hour periods.

Circulation within the site is in one direction. This reduces conflict points between vehicles reducing the probability of collisions within the site as well as their severity.

The driveway to Singleton Drive is proposed for construction traffic only and would rarely be used once the site is in operation.

F.4. Safety and Operational Improvements

The site driveways and project improvements must be designed so that adequate sight distance for drivers entering and exiting is maintained. Because these driveways are at the end of the cul-de-sac on Fortuna way, they act as an extension of the roadway recuing the need for sight distance as there are no conflicting movements.

Nevertheless, adequate sight distance must be maintained at both driveways. The line of sight, a straight line between the driver's eye and oncoming vehicles on the adjacent roadway, defines the Limited Use Area. The Limited Use Area for each driveway must be kept clear of visual obstructions, including project signs, building structures, and landscaping, in order to maintain adequate sight distance.

The proposed driveways of the site were also verified to provide sufficient space for ingress and egress of design vehicles. The driveways at the end of Fortuna Way were assessed with a WB-67 design vehicle. The driveway at the end of Singleton Drive is exclusive to construction vehicles. As a result, a dump truck was used as a design vehicle. Appendix I includes the truck turning templates for all proposed driveways of the site.

F.5. Fair Share Calculations

The mitigations proposed by this report coincide with the City of Rialto General Plan. The City's Development Impact Fee (DIF) document includes the widening of Riverside Drive between I-10 eastbound ramps and Agua Mansa Road. According to the DIF from 2016 the total cost of the widening of S Riverside Avenue is $40,429,920. The bridge widening associated with this project already has funding at $15,000,000 allocated for it. The remaining balance of $25,429,920 was utilized for fair share calculations. The length of the widening project was measured to be 18724 feet. A unit cost per one hundred (100) feet of widening was calculated using the net cost of the project compared to the length of the project to be $198,919.90 per one hundred feet of widening. The cost estimate for S Riverside Avenue is included in Appendix J.

Intersection specific improvements to S Riverside Avenue at Slover Avenue are also included in the DIF Nexus Study with a separate cost of $355,200. This cost estimate is also included in Appendix J. While there are no specific cost estimates associated with the other two significantly impacted intersections, the cost estimate for S Riverside at Slover Avenue was utilized to calculate the fair share cost associated with the other two significantly impacted intersections.

Tables 17 and 18 calculate the fair share of each significantly impacted intersection and roadway segment. The percentage is then used to calculate the fair share cost associated with the burden of adding the project trips to that specific intersection or segment. Table 19 summarizes this cost per impacted intersection/segment as well as the total cost owed by the developer to the City of Rialto in traffic impact fees. Based on this calculation, the City of Rialto is owed $724,397.81 in fair share costs as part of the permitting process for the subject project.

Table 17: Fair Share of Mitigation Measures – Intersections

Intersection		AM Peak					PM Peak				
		Total Volume		Total Growth	Project		Total Volume		Total Growth	Project	
		E	E+G+C+P		Trips	%age	E	E+G+C+P		Trips	%age
3	S Riverside Ave. at I-10 EB Ramps	3,720	5,221	1,501	96	6.4%	4,779	6,230	1,451	123	8.5%
4	S Riverside Ave. at Slover Ave.	3,157	4,719	1,562	95	6.1%	4,047	5,441	1,394	135	9.7%
5	S Riverside Ave. at Santa Ana Ave.	2,669	4,043	1,374	95	6.9%	3,332	4,501	1,169	141	12.1%

Table 18: Fair Share of Mitigation Measures – Segments (S Riverside Avenue)

Segment	Total Daily Volume		Total Daily Growth	Daily Project Trips	Project Percentage
	E	E+G+C+P			
I-10 EB ramps to Slover Ave	49,897	69,501	19,604	730	3.7%
Slover Ave to Santa Ana Ave	42,626	71,948	29,322	821	2.8%
Santa Ana Ave to Industrial Dr	36,839	64,241	27,402	844	3.1%
Industrial Dr to Agua Mansa Rd	47,673	72,424	24,751	427	1.7%

F.6. Specific Plan Signalization

Not Applicable.

F.7. General Plan Conformance

The proposed manufacturing facility is in conformance with the Agua Mansa Specific Plan and the City of Rialto General Plan. The proposed manufacturing facility use is permitted under the Employment and Employment Overlay land use designations. Neither a Specific Plan Amendment nor a General Plan Amendment is required for this project.

Table 19: Mitigation Fair Share Cost

Intersection/Segment	Unit Cost	Quantity[1]	Total
S Riverside Avenue at I-10 EB Ramps	$ 355,200.00	1	$ 355,200.00
Project Fair Share Percentage (E vs E+G+C+P)[2]			8.5%
Project Cost			$ 30,109.99
S Riverside Avenue at Slover Avenue	$ 355,200.00	1	$ 355,200.00
Project Fair Share Percentage (E vs E+G+C+P)[2]			9.7%
Project Cost			$ 34,398.85
S Riverside Avenue at Santa Ana Ave.	$ 355,200.00	1	$ 355,200.00
Project Fair Share Percentage (E vs E+G+C+P)[2]			12.1%
Project Cost			$ 42,842.77
I-10 EB ramps to Slover Ave	$ 198,919.90	18.97	$ 3,773,510.50
Project Fair Share Percentage (E vs E+G+C+P)			3.7%
Project Cost			$ 140,515.34
Slover Ave to Santa Ana Ave	$ 198,919.90	26.57	$ 5,285,301.74
Project Fair Share Percentage (E vs E+G+C+P)			2.8%
Project Cost			$ 147,985.56
Santa Ana Ave to Industrial Dr	$ 198,919.90	17.11	$ 3,403,519.49
Project Fair Share Percentage (E vs E+G+C+P)			3.1%
Project Cost			$ 104,830.69
Industrial Dr to Agua Mansa Rd	$ 198,919.90	65.19	$ 12,967,588.27
Project Fair Share Percentage (E vs E+G+C+P)			1.7%
Project Cost			$ 223,714.61
Total Project Cost			**$ 724,397.81**

[1]1 for intersections and measured in 100s of feet for roadway segments
[2]Higher of AM or PM project fair share percentage

Appendices

Appendix A – Scoping Document

MEMORANDUM

To: Daniel Casey, City of Rialto, California (dcasey@rialtoca.gov)

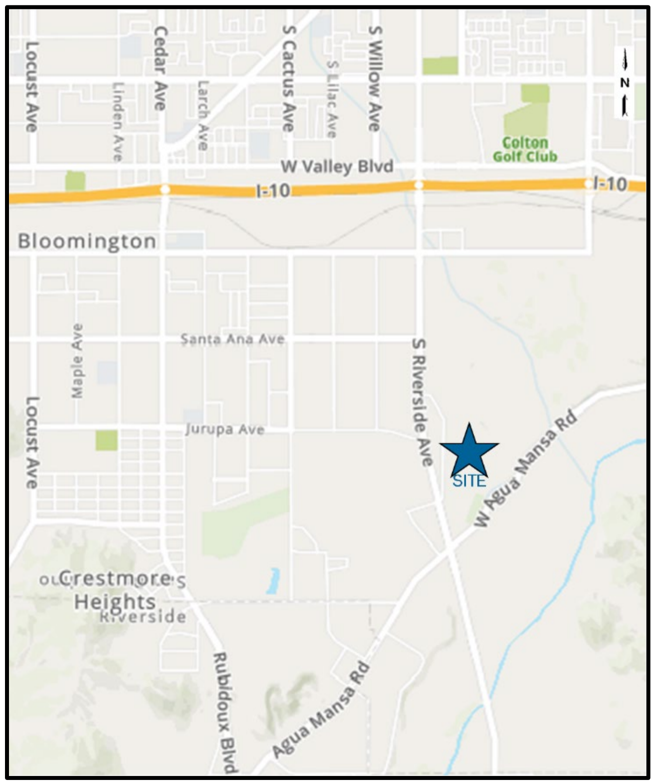
From: Victoria Guobaitis, PE, PTOE, NV5 Traffic Consultant (victoria.guobaitis@NV5.com)

CC: John Quigley, PE, Angelus Block Co., Inc. (JQuigley@angelusblock.com)

Date: April 19, 2021

Re: MC 2020-0012
Angelus Block Co. Inc
0 Fontana Way
Rialto, CA 92316
Traffic Scoping Memo

This memorandum reviews the scope of a proposed manufacturing building to be developed on parcels with APN 0260-061-67, APN 0260-061-41, and APN 0260-061-42. This memo serves as the initiating scoping memorandum between the City of Rialto and NV5 as the traffic engineering consultant on behalf Angelus Block Co, Inc.



EXISTING SITE INFORMATION

The proposed site is made up of three parcels and is located east of S Riverside Avenue and north of Agua Mansa Road in the southern part of Rialto. The site is located approximately 1.5 miles south of Interstate 10 (I-10). The proposed site is located on the 8th subset within the Agua Mansa Specific Plan which is consisted of primarily general industry land-use with minimal residential.

PROPOSED SITE INFORMATION

The project will involve the construction of a manufacturing plant building with 135,581 square feet, an office building with 10,018 square feet, a storage warehouse with 14,160 square feet, a mechanical shop with 7,200 square feet, and a metal canopy with 21,534 square feet.

Access to the site is provided via a cul-de-sac at the end of Fontana Way. There are two one-way driveways spaced out within this cul-de-sac: one for entering and one for exiting. A secondary entrance is via Singleton Dr at the southern portion of the proposed site. This entrance is dedicated to construction vehicles and will not be used for daily operations once construction of the site is complete.

SCOPING MEMO

See the attached Scoping Memo as provided by the City of Rialto's *Traffic Impact Analysis Report Guidelines and Requirements* (December 2013). It includes key expectations that will be included in the forth coming Traffic Impact Study (TIS).

Exhibit B

SCOPING AGREEMENT FOR TRAFFIC IMPACT ANALYSIS

This following form shall be used to acknowledge preliminary approval of the scope for the traffic impact analysis (TIA) of the following project. The TIA must follow the City of Rialto Traffic Impact Analysis – Report Guidelines and Requirements, adopted by the City Council on 2014.

City of Rialto

Traffic Impact Analysis

Scoping Agreement

Case No. MC 2020-0012

Related Cases -

SP No.

EIR No.

GPA No.

ZC No.

Project Name: Angelus Block Co., Inc. - Attachment 1 - Site Plan

Project Address: 0 Fortuna Way (no address at this time), Rialto CA 92316

Project Description: Construct Concrete Block Manufacturing Facility and Ancillary Site on Two Vacant Parcels

	Consultant	Developer
Name:	NV5	Angelus Block Co., Inc.
Address:	3777 Long Beach Blvd, Annex Bldg	11374 Tuxford Street
Telephone:	Long Beach, CA 90807	Sun Valley, CA 91352
Fax:	(800) 608-3010	(818) 767-8576
	n/a	n/a

1. Trip Generation Source: ITE Trip Generation Manual, most recent 10th Edition (2017)

Existing GP Land Use Vacant Proposed Land Use Manufacturing (140)

Current Zoning: Aqua Mansa Specific Plan Proposed Zoning: No Change

Total Daily Project Trips: 1,270 (with PCE) - Attachment 2 - Trip Generation Table

	Current Trip Generation			Proposed Trip Generation (w/ PCE)		
	In	Out	Total	In	Out	Total
AM Trips	n/a	n/a	n/a	151	45	196
PM Trips	n/a	n/a	n/a	65	147	213

Internal Trip Allowance Yes No X (0 % Trip Discount)

Pass-By Trip Allowance Yes No X (0 % Trip Discount)

For appropriate land uses, a pass-by trip discount may be allowed not to exceed 25%. Discount trips shall be indicated on a report figure for intersections and access locations.

Attachment 4 & 5 - Passenger Car and Truck Distribution

2. Trip Geographic Distribution: N % S % E % W %

(Detailed exhibits of trip distribution must be attached with Trucks as a separate exhibit)

3. Background Growth Traffic

Project Completion Year: 2022 Annual Background Growth Rate: 2 %

Other Phase Years n/a

Other area projects to be considered: Attachment 6 & 7 - Cumulative projects map and list.

(Contact Planning for Lists. Correlate projects to exhibit map and also indicate which projects have been included in study area forecasts for existing + background growth + project + cumulative)

Model/Forecast methodology: Existing + Growth + Project, Cumulative Projects to Opening Year

4. Study Intersections: (NOTE: Subject to revision after other projects, trip generation and distribution are determined, or comments from other agencies received.)

Attachment 3 - Study Area

1. S. Riverside Ave at I-10 WB ramps
2. S. Riverside Ave at I-10 EB ramps
3. S. Riverside Ave at Slover Ave
4. S. Riverside Ave at Santa Ana Ave
5. S. Riverside Ave at Industrial Dr
6. S. Riverside Ave at Resource Dr/Industrial Dr
7. S. Riverside Ave at Agua Mansa Rd
8. Industrial Dr at Fortuna Way
9. S. Riverside Dr at W. Valley Blvd
10. S. Riverside Dr at Singleton Dr
11. S. Riverside Dr at Jurupa Ave
12. Resource Dr at Enterprise Dr

5. Study Roadway Segments: (NOTE: Subject to revision after other projects, trip generation and distribution are determined, or comments from other agencies received.)

1. S. Riverside Ave - Industrial Dr to Santa Ana Ave
2. S. Riverside Ave - Agua Mansa Rd to Resource Dr
3. S. Riverside Ave - Santa Ave to Slover Ave
4. S. Riverside Ave - Slover Ave to I-10 EB ramps
5. S. Riverside Ave - I-10 EB ramps to I-10 WB ramps
6. ______
7. ______
8. ______
9. ______
10. ______

6. Other Jurisdictional Impacts

Is this project within any other Agency's Sphere of Influence or within one-mile of another jurisdictional boundary? __X__ YES ______ NO

If so, name of Jurisdiction: City of Colton, City of Jurupa Valley and County of San Bernardino

7. Site Plan (please attach 11" x 17" legible copy) - see Attachment 1 - Site Plan

8. Specific issues to be addressed in the Study (in addition to the standard analysis described in the Guideline) (to be filled out by the City of Rialto Public Works Department) (NOTE: If the traffic study states that "a traffic signal is warranted" (or "a traffic signal appears to be warranted," or similar statement) at an existing un-signalized intersection under existing conditions, 8-hour approach traffic volume information must be submitted in addition to the peak hourly turning movement counts for that intersection.)

Fair-Share Analysis Table with industry standard cost estimate for each improvement

Peak Hour Signal Warrant Analysis for unsignalized study intersections

Site circulation discussion, including truck turning radii at site driveways with exhibit in report

VMT analysis

9. Existing Conditions

Traffic count data must be new or within one year. Provide traffic count dates if using other than new counts.

Date of counts: Due to pandemic, historical counts will be obtained and an annual growth rate applied to develop year "2020" counts. Methodology to be included in report.

NOTE Fees are due and must be submitted with, or prior to submittal of this form. The City will not process the Scoping Agreement prior to the receipt of the processing fee.

Fees Paid: ______________ Date ______________

Recommended:

Scoping Agreement Submittal date 01/20/2021

Scoping Agreement Resubmittal date 03/31/2021

NV5 03/31/2021

Applicant/Engineer Date

Land Use Concurrence:

Development Services Department Date

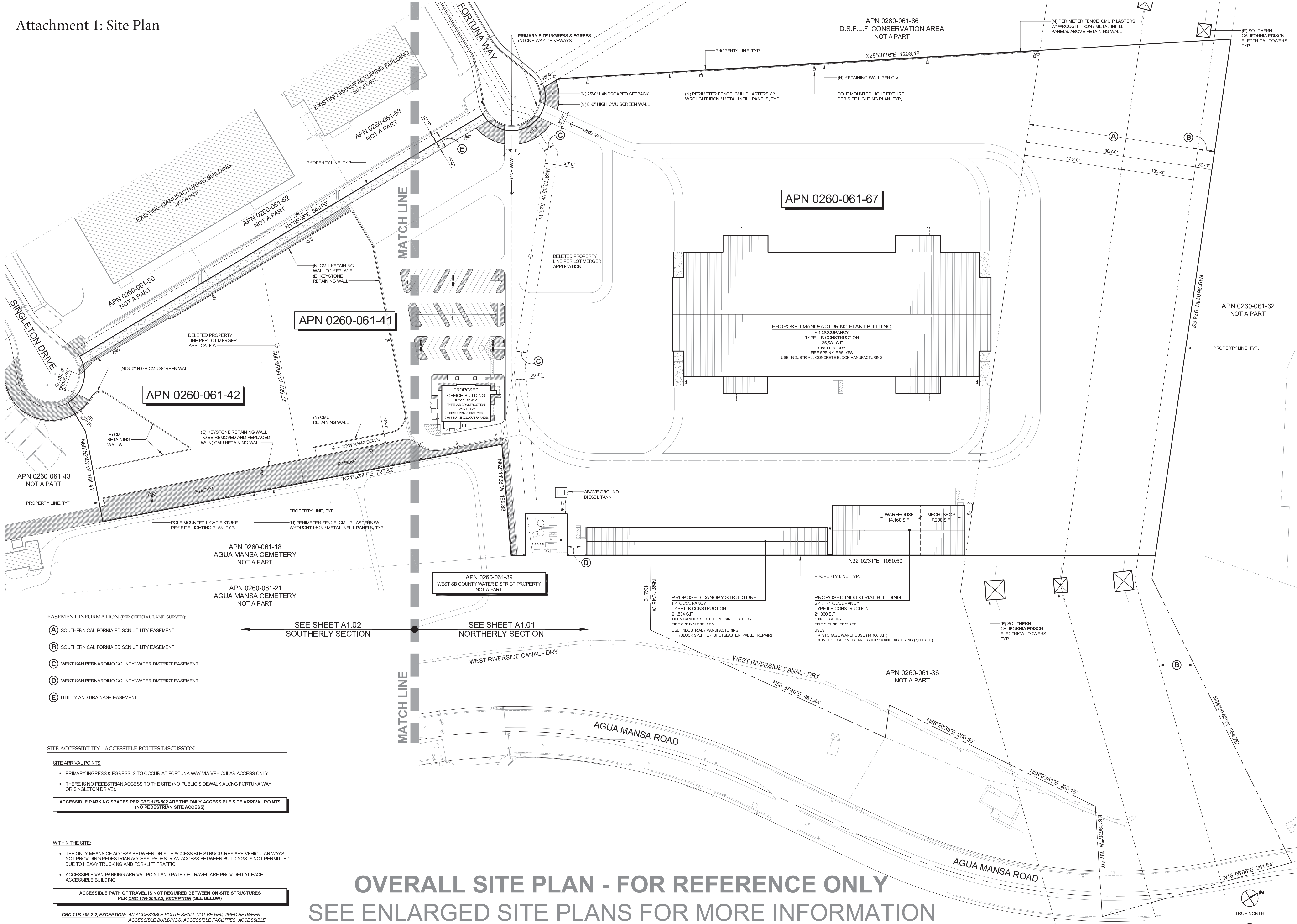
Approved by:

Public Works Department Date

NOTE:

The Applicant/Engineer acknowledges that the Scoping Agreement is intended to assist in the preparation of any required TIA. It is preliminary in nature and the City does not have sufficient data to determine the ultimate conditions that may be imposed for the project. It does not provide nor limit the requirements imposed on the Project but is intended only to provide initial input into the parameters for review of the traffic generated by the Project and the initial areas to be considered and studied. Subsequent changes to scope of required analysis to be included in the TIA may be required by the Transportation Commission, Planning Commission, and/or the City Council upon Public Works Director/City Engineer review and approval.

Attachment 1: Site Plan



EASEMENT INFORMATION (PER OFFICIAL LAND SURVEY):

- A SOUTHERN CALIFORNIA EDISON UTILITY EASEMENT
- B SOUTHERN CALIFORNIA EDISON UTILITY EASEMENT
- C WEST SAN BERNARDINO COUNTY WATER DISTRICT EASEMENT
- D WEST SAN BERNARDINO COUNTY WATER DISTRICT EASEMENT
- E UTILITY AND DRAINAGE EASEMENT

SITE ACCESSIBILITY - ACCESSIBLE ROUTES DISCUSSION

SITE ARRIVAL POINTS:

- PRIMARY INGRESS & EGRESS IS TO OCCUR AT FORTUNA WAY VIA VEHICULAR ACCESS ONLY.
- THERE IS NO PEDESTRIAN ACCESS TO THE SITE (NO PUBLIC SIDEWALK ALONG FORTUNA WAY OR SINGLETON DRIVE).

ACCESSIBLE PARKING SPACES PER *CBC 11B-502* ARE THE ONLY ACCESSIBLE SITE ARRIVAL POINTS (NO PEDESTRIAN SITE ACCESS)

WITHIN THE SITE:

- THE ONLY MEANS OF ACCESS BETWEEN ON-SITE ACCESSIBLE STRUCTURES ARE VEHICULAR WAYS NOT PROVIDING PEDESTRIAN ACCESS. PEDESTRIAN ACCESS BETWEEN BUILDINGS IS NOT PERMITTED DUE TO HEAVY TRUCKING AND FORKLIFT TRAFFIC.
- ACCESSIBLE VAN PARKING ARRIVAL POINT AND PATH OF TRAVEL ARE PROVIDED AT EACH ACCESSIBLE BUILDING.

ACCESSIBLE PATH OF TRAVEL IS NOT REQUIRED BETWEEN ON-SITE STRUCTURES PER *CBC 11B-206.2.2, EXCEPTION* (SEE BELOW)

***CBC 11B-206.2.2, EXCEPTION*:** *AN ACCESSIBLE ROUTE SHALL NOT BE REQUIRED BETWEEN ACCESSIBLE BUILDINGS, ACCESSIBLE FACILITIES, ACCESSIBLE ELEMENTS, AND ACCESSIBLE SPACES IF THE ONLY MEANS OF ACCESS BETWEEN THEM IS A VEHICULAR WAY NOT PROVIDING PEDESTRIAN ACCESS.*

OVERALL SITE PLAN - FOR REFERENCE ONLY

SEE ENLARGED SITE PLANS FOR MORE INFORMATION

Mark	Revisions	Date

Mark	Revisions	Date

ANGELUS BLOCK CO., INC.
PROPOSED MANUFACTURING FACILITY
APN'S: 0260-061-67-0000, 0260-061-41-0000, 0260-061-42-0000
RIALTO, CA 92316

LICENSED ARCHITECT
FRANK J. LONI
C-35616
REN. 7/31/2021
STATE OF CALIFORNIA

LONI architects
LONI, INC.
architecture + engineering
1050 Lakes Dr. #225 | West Covina, CA 91790
T: 626.508.1977
E: admin@loniarchitects.com
www.loniarchitects.com

Drawn By: F. LONI
Signed: 2/10/2021
Permit No.
Permit Date
Sheet: A1.00
Job Number: 19-050

OVERALL REFERENCE SITE PLAN — 1" = 60'-0" — 1

Attachment 2
Angelus Block Co., Inc.

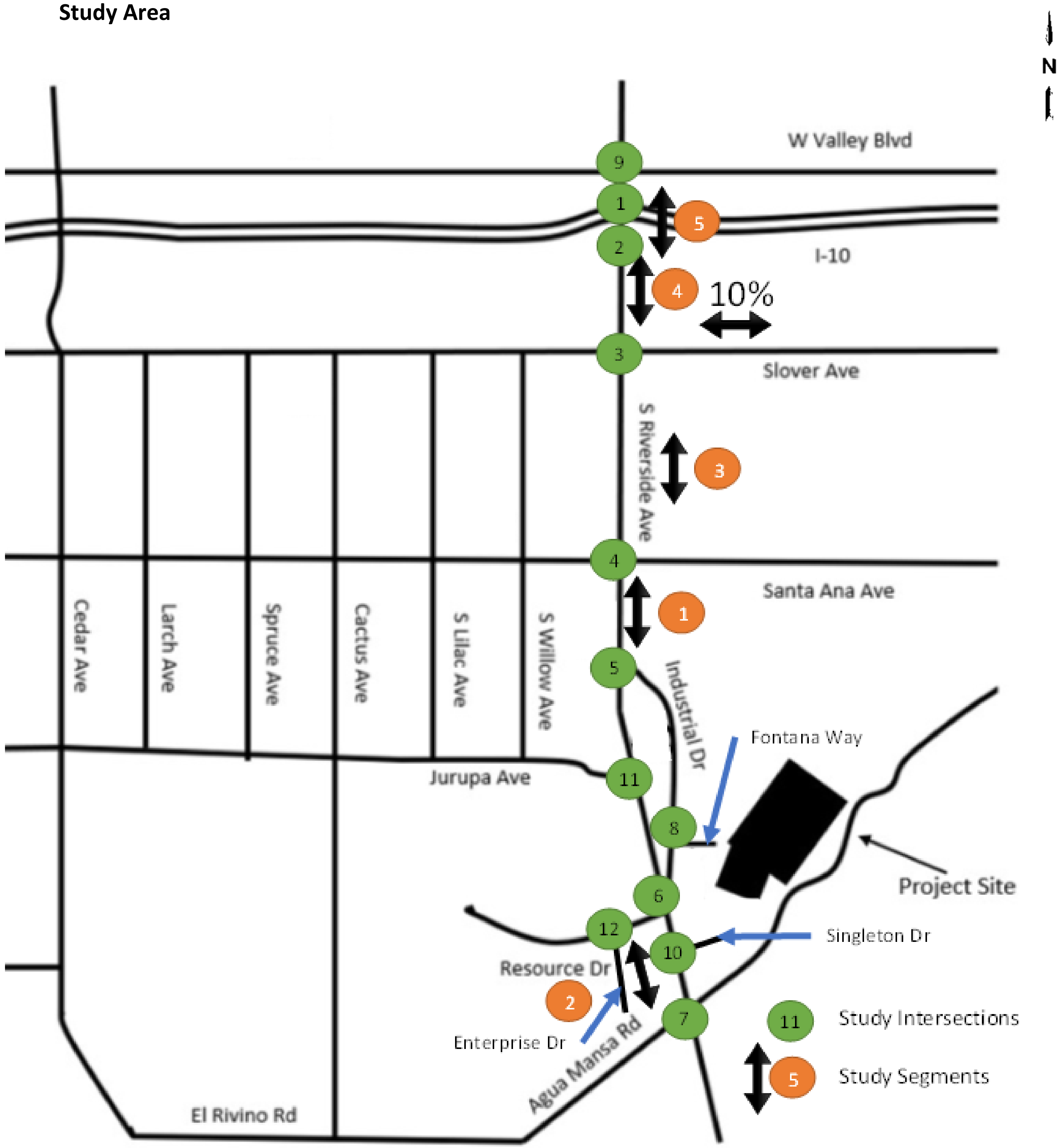
Summary of Project Trip Generation
Angelus Block Co., Inc.

Land Use[1]		Quantity	Units	Daily	AM Peak Hour			PM Peak Hour		
					In	Out	Total	In	Out	Total
Manufacturing (LUC 140)		189,207	SF	758	90	27	117	39	88	127
Passenger Vehicles	60%			455	54	16	70	23	53	76
Trucks	40%			303	36	11	47	16	35	51
Vehicle Type	**Vehicle Mix[2]**	**Daily Vehicles**	**PCE Factor**	**Daily PCE Vehicles**	**AM Peak Hour**			**PM Peak Hour**		
					In	**Out**	**Total**	**In**	**Out**	**Total**
Passenger Vehicles	60.0%	455	1.0	455	54	16	70	23	53	76
2-Axle Trucks	0.8%	6	1.5	9	1	0	1	0	1	2
3-Axle Trucks	11.2%	85	2.0	170	20	6	26	9	20	28
4+ Axle Trucks	28.0%	212	3.0	637	76	23	98	33	74	107
Total Truck PCE Trips				**816**	**97**	**29**	**126**	**42**	**95**	**137**
Total Project PCE Trips				**1,270**	**151**	**45**	**196**	**65**	**147**	**213**

1 - Source: ITE Trip Geneneration Manual, 10th Edition
2 - Source: City of Rialto Traffic Impact Analysis Report Guidelines and Requirements, December 2013
PCE = Passenger Car Equivalent
SF = Square Feet

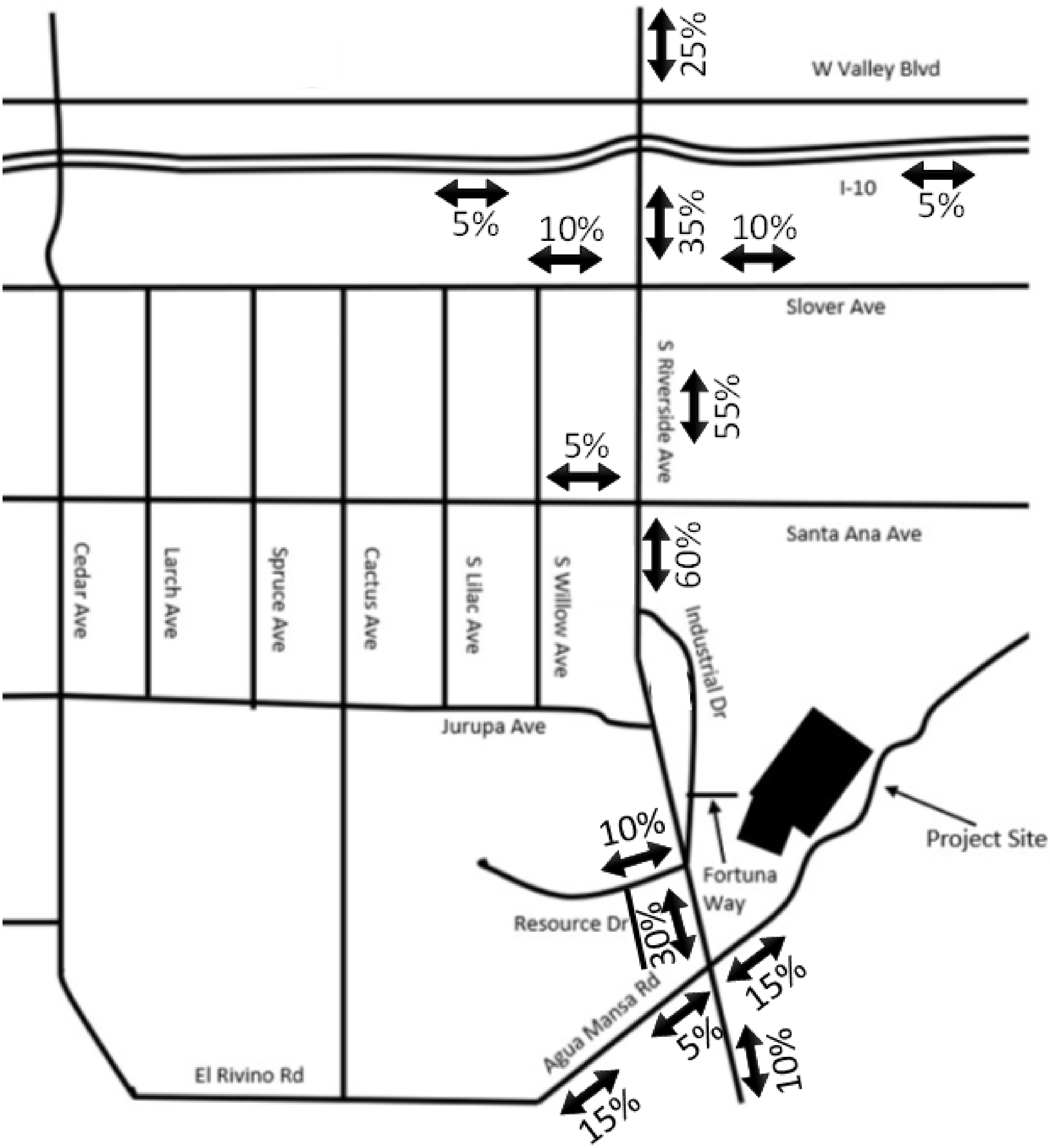
Attachment 3
Angelus Block Co., Inc.

Study Area



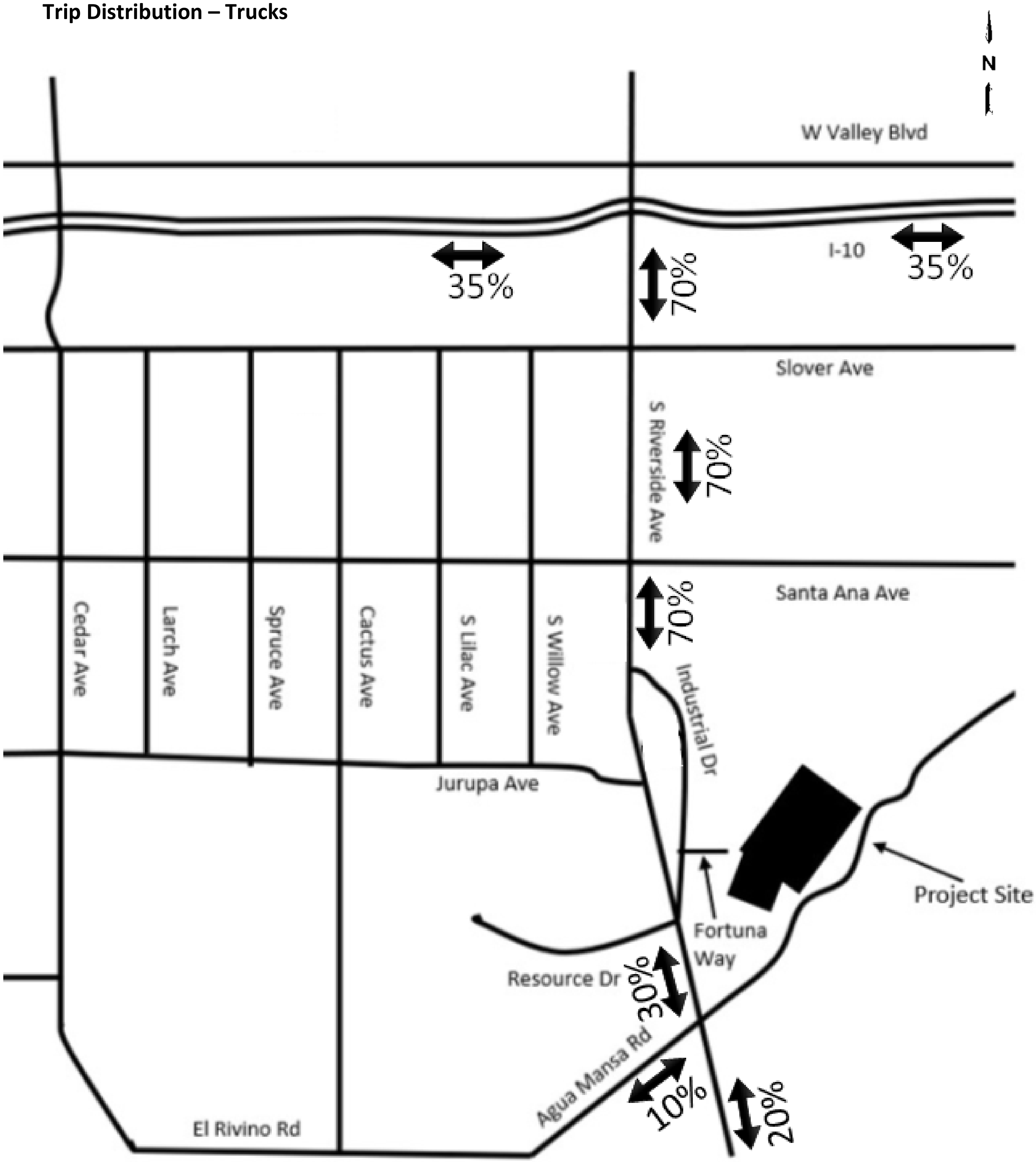
Attachment 4
Angelus Block Co., Inc.

Trip Distribution – Passenger Cars



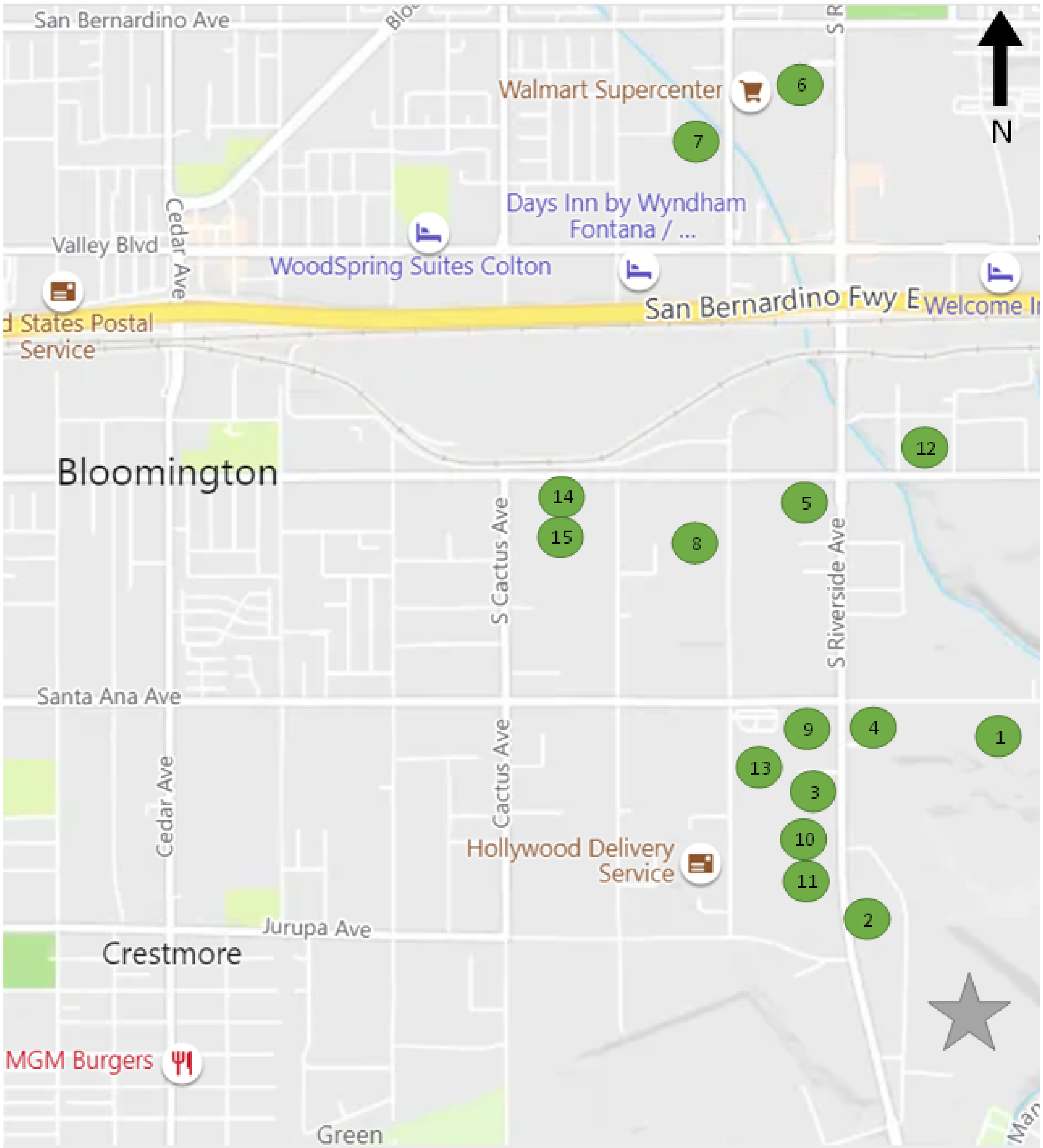
Attachment 5
Angelus Block Co., Inc.

Trip Distribution – Trucks



Attachment 6
Angelus Block Co., Inc.

Location of Cumulative Projects

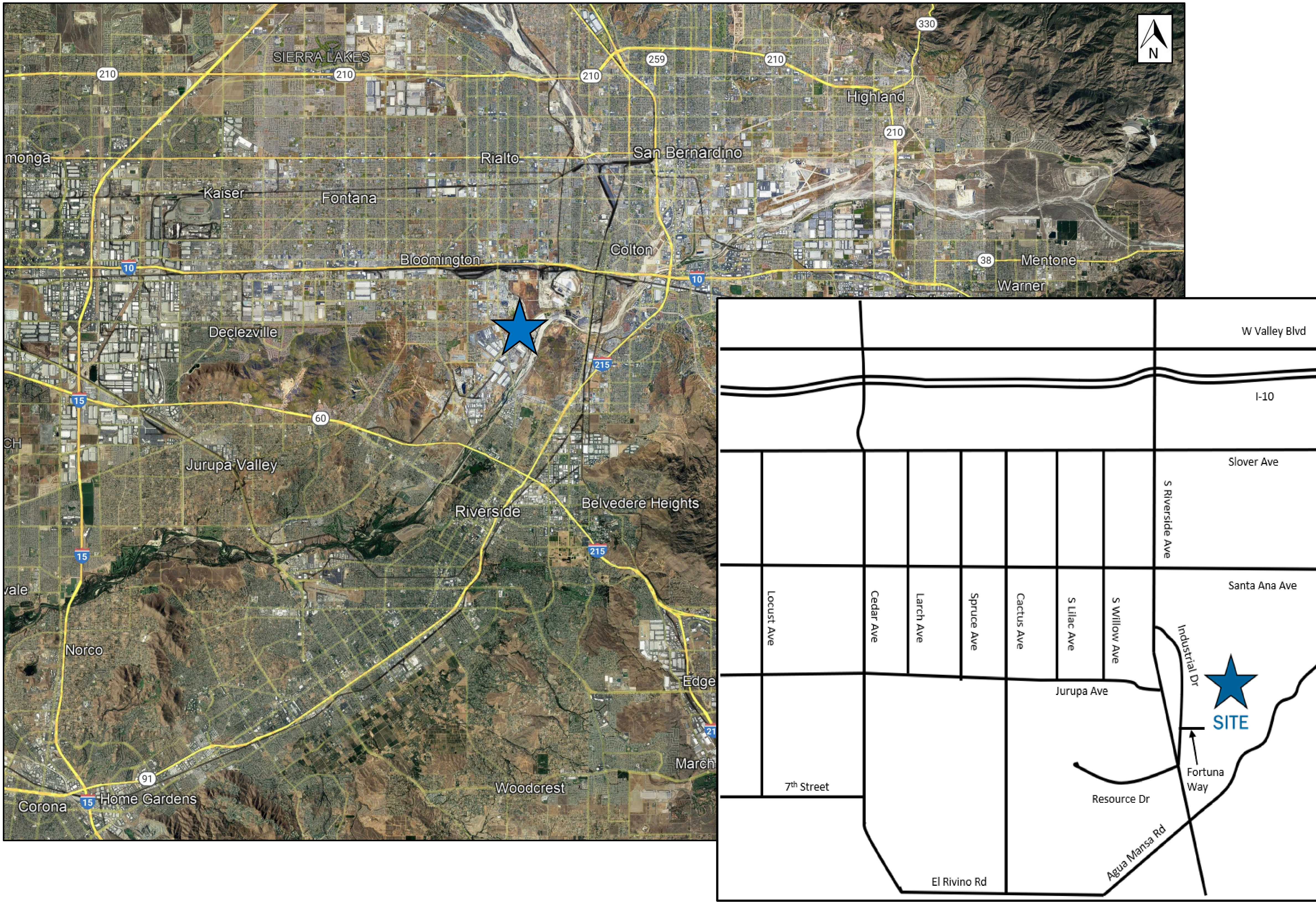


Attachment 7
Angelus Block Co., Inc. Summary of Cumulative Projects

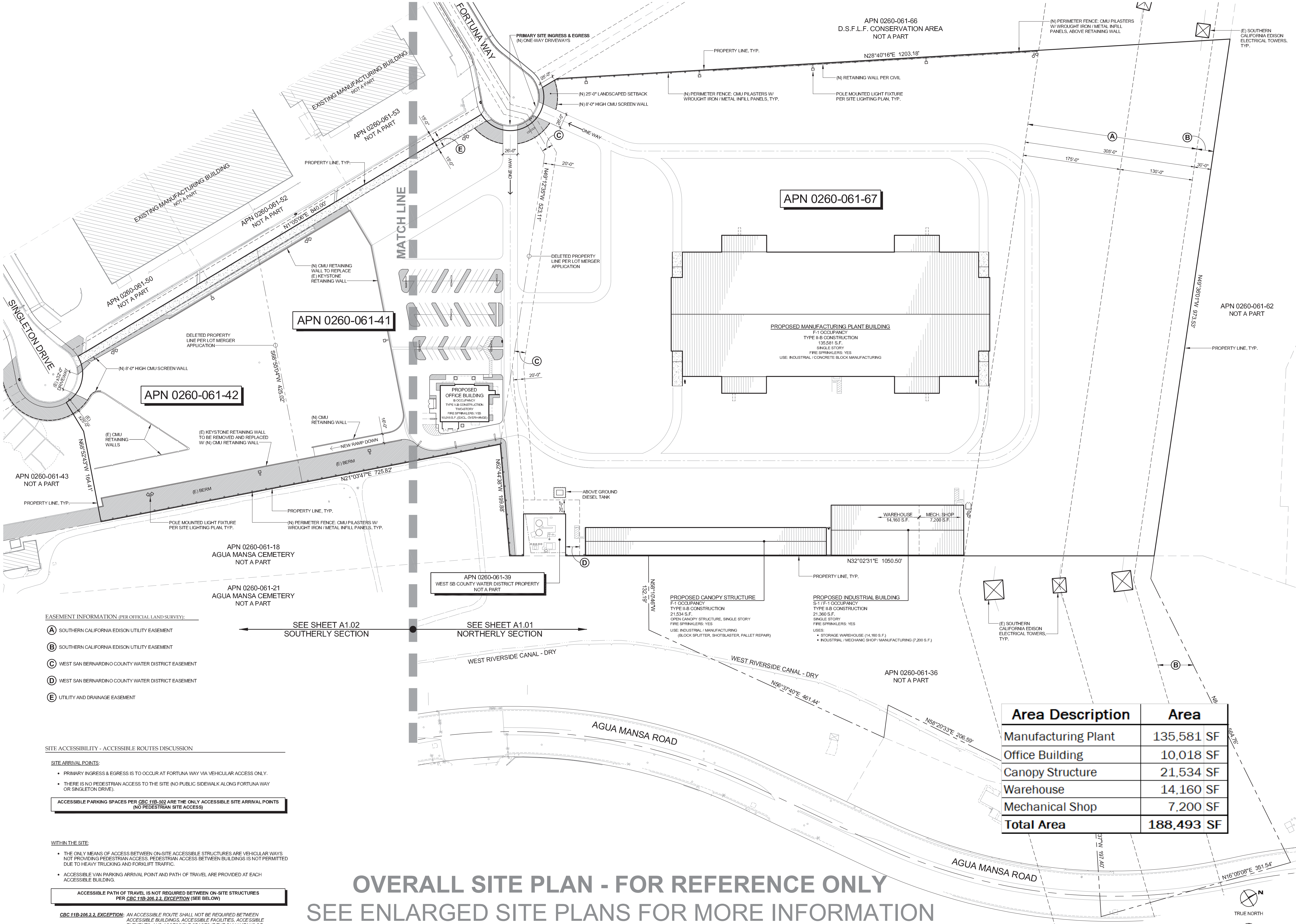
ID	Project Name	Land Use	Quantity	Units
1	South of Santa Ana Ave, East of Riverside Ave	Warehouse	370	TSF
2	SEC of Riverside Ave and Industrial Dr.	Trucking	3.58	AC
3	NWC of Riverside Ave and Industrial Dr.	Truck Drop	3.36	AC
4	SEC of Riversdie Ave and Santa Ana Ave.	Super Conveniant Market/Gas Station	16	VFP
		Diesel Station	2	VFP
5	SWC of Riversdie Ave and Slover Ave.	Fast Food w/Drive Thru	5.2	TSF
6	North of Valley Blvd and west of Riverside Ave.	Warehouse	492.41	TSF
7	Valley/Willow Warehouse	Warehouse	492.41	TSF
8	Old Dominion Expansion	Parking Lot (407 Spaces)	7.78	AC
9	SC Fuels	Fuel Storage/Service	54.46	TSF
10	Lynn Trucking	Truck Parking Yard	3.07	AC
		Car Wash/Repair	8.827	TSF
11	Riverside Pallet Yard	Pallet Yard	3.58	AC
12	Onyx Paving	Contractor's Yard	0.77	AC
13	Bakery Addition	Bakery	14	TSF
14	Flyers Energy Addition	Warehouse	9.35	TSF
15	Lilac Avenue Truck Terminal	Trucking	9.44	AC

Appendix B – Vicinity Map

Angelus Block Co. Site Vicinity Map



Appendix C – Site Plan



EASEMENT INFORMATION (PER OFFICIAL LAND SURVEY):

- (A) SOUTHERN CALIFORNIA EDISON UTILITY EASEMENT
- (B) SOUTHERN CALIFORNIA EDISON UTILITY EASEMENT
- (C) WEST SAN BERNARDINO COUNTY WATER DISTRICT EASEMENT
- (D) WEST SAN BERNARDINO COUNTY WATER DISTRICT EASEMENT
- (E) UTILITY AND DRAINAGE EASEMENT

SITE ACCESSIBILITY - ACCESSIBLE ROUTES DISCUSSION

SITE ARRIVAL POINTS:

- PRIMARY INGRESS & EGRESS IS TO OCCUR AT FORTUNA WAY VIA VEHICULAR ACCESS ONLY.
- THERE IS NO PEDESTRIAN ACCESS TO THE SITE (NO PUBLIC SIDEWALK ALONG FORTUNA WAY OR SINGLETON DRIVE).

ACCESSIBLE PARKING SPACES PER *CBC 11B-502* ARE THE ONLY ACCESSIBLE SITE ARRIVAL POINTS (NO PEDESTRIAN SITE ACCESS)

WITHIN THE SITE:

- THE ONLY MEANS OF ACCESS BETWEEN ON-SITE ACCESSIBLE STRUCTURES ARE VEHICULAR WAYS NOT PROVIDING PEDESTRIAN ACCESS. PEDESTRIAN ACCESS BETWEEN BUILDINGS IS NOT PERMITTED DUE TO HEAVY TRUCKING AND FORKLIFT TRAFFIC.
- ACCESSIBLE VAN PARKING ARRIVAL POINT AND PATH OF TRAVEL ARE PROVIDED AT EACH ACCESSIBLE BUILDING.

ACCESSIBLE PATH OF TRAVEL IS NOT REQUIRED BETWEEN ON-SITE STRUCTURES PER *CBC 11B-206.2.2, EXCEPTION* (SEE BELOW)

***CBC 11B-206.2.2, EXCEPTION*:** *AN ACCESSIBLE ROUTE SHALL NOT BE REQUIRED BETWEEN ACCESSIBLE BUILDINGS, ACCESSIBLE FACILITIES, ACCESSIBLE ELEMENTS, AND ACCESSIBLE SPACES IF THE ONLY MEANS OF ACCESS BETWEEN THEM IS A VEHICULAR WAY NOT PROVIDING PEDESTRIAN ACCESS.*

Area Description	Area
Manufacturing Plant	135,581 SF
Office Building	10,018 SF
Canopy Structure	21,534 SF
Warehouse	14,160 SF
Mechanical Shop	7,200 SF
Total Area	**188,493 SF**

OVERALL SITE PLAN - FOR REFERENCE ONLY

SEE ENLARGED SITE PLANS FOR MORE INFORMATION

OVERALL REFERENCE SITE PLAN 1" = 60'-0" 1

ANGELUS BLOCK CO., INC.
PROPOSED MANUFACTURING FACILITY
APN'S: 0260-061-67-0000, 0260-061-41-0000, 0260-061-42-0000
RIALTO, CA 92316

LICENSED ARCHITECT
FRANK J. LONI
C-35616
REN. 7/31/2021
STATE OF CALIFORNIA

LONI architects
LONI, INC.
architecture + engineering
1050 Lakes Dr. #225 | West Covina, CA 91790
T: 626.508.1977
E: admin@loniarchitects.com
www.loniarchitects.com

Mark	Revisions	Date

Sheet A1.00
Drawn By F. LONI
Signed 2/10/2021
Permit No.
Permit Date
Job Number 19-050

Appendix D – Historic Traffic Counts (in lieu of new existing counts)

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:	LOCATION:	Rialto	PROJECT #:	SC2522
Wed, Feb 12, 20	NORTH & SOUTH:	Riverside	LOCATION #:	1
	EAST & WEST:	Valley	CONTROL:	SIGNAL

NOTES:

Queue SB AM

AM / PM / MD / OTHER / OTHER

▲ N ◄ W E ► S ▼

Add U-Turns to Left Turns

		NORTHBOUND Riverside			SOUTHBOUND Riverside			EASTBOUND Valley			WESTBOUND Valley				U-TURNS				
		NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB	TTL
	LANES:	2	2.5	0.5	1	2.5	0.5	1	2	1	1	2	1		0	0	0	0	
AM	7:00 AM	60	139	34	16	278	7	5	45	119	34	43	9	789	2	1	1	0	4
AM	7:15 AM	90	155	17	12	259	6	10	31	147	54	34	4	819	1	1	2	1	5
AM	7:30 AM	89	160	35	12	317	7	7	50	134	35	48	11	905	3	0	0	0	3
AM	7:45 AM	89	153	53	18	252	8	12	47	114	28	31	8	813	1	0	1	1	3
AM	8:00 AM	52	140	41	10	246	16	10	70	116	29	33	15	778	2	2	1	0	5
AM	8:15 AM	66	144	47	18	202	8	13	35	88	36	54	12	723	1	1	0	1	3
AM	8:30 AM	65	157	37	13	196	13	16	39	99	26	36	17	714	1	0	1	1	3
AM	8:45 AM	77	192	31	8	176	11	11	31	84	33	26	13	693	1	0	0	2	3
AM	VOLUMES	588	1,240	295	107	1,926	76	84	348	901	275	305	89	6,234	12	5	6	6	29
AM	APPROACH %	28%	58%	14%	5%	91%	4%	6%	26%	68%	41%	46%	13%						
AM	APP/DEPART	2,123	/	1,412	2,109	/	3,108	1,333	/	751	669	/	963	0					
AM	BEGIN PEAK HR		7:00 AM																
AM	VOLUMES	328	607	139	58	1,106	28	34	173	514	151	156	32	3,326					
AM	APPROACH %	31%	57%	13%	5%	93%	2%	5%	24%	71%	45%	46%	9%						
AM	PEAK HR FACTOR		0.910			0.887			0.944			0.902		0.919					
AM	APP/DEPART	1,074	/	671	1,192	/	1,776	721	/	370	339	/	509	0					
PM	4:00 PM	130	363	49	20	198	12	13	66	118	39	77	29	1,114	1	0	1	0	2
PM	4:15 PM	114	290	36	18	202	13	22	65	110	39	46	28	983	1	0	0	2	3
PM	4:30 PM	101	338	47	16	185	6	21	60	122	24	54	31	1,005	0	1	0	1	2
PM	4:45 PM	124	305	36	19	198	15	23	61	122	46	79	28	1,056	0	0	5	0	5
PM	5:00 PM	135	302	64	16	191	12	23	62	120	45	67	38	1,075	1	0	3	0	4
PM	5:15 PM	143	313	31	21	162	7	14	72	129	42	85	31	1,050	1	0	0	4	5
PM	5:30 PM	141	335	32	22	232	20	31	56	106	39	64	29	1,107	0	3	1	1	5
PM	5:45 PM	123	283	29	19	186	16	25	51	93	30	54	24	933	0	2	0	1	3
PM	VOLUMES	1,011	2,529	324	151	1,554	101	172	493	920	304	526	238	8,323	4	6	10	9	29
PM	APPROACH %	26%	65%	8%	8%	86%	6%	11%	31%	58%	28%	49%	22%						
PM	APP/DEPART	3,864	/	2,935	1,806	/	2,773	1,585	/	971	1,068	/	1,644	0					
PM	BEGIN PEAK HR		4:45 PM																
PM	VOLUMES	543	1,255	163	78	783	54	91	251	477	172	295	126	4,288					
PM	APPROACH %	28%	64%	8%	9%	86%	6%	11%	31%	58%	29%	50%	21%						
PM	PEAK HR FACTOR		0.965			0.835			0.952			0.938		0.968					
PM	APP/DEPART	1,961	/	1,466	915	/	1,429	819	/	494	593	/	899	0					

Riverside

NORTH SIDE

Valley WEST SIDE

EAST SIDE **Valley**

SOUTH SIDE

Riverside

National Data & Surveying Services Intersection Turning Movement Count

Location: S Riverside Ave & I-10 WB Ramps
City: Rialto
Control: Signalized

Project ID: Historical
Date: 4/12/2018

Total

NS/EW Streets:	S Riverside Ave				S Riverside Ave				I-10 WB Ramps				I-10 WB Ramps				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	2	3	0	0	0	4	1	0	0	0	0	0	1.3	0.3	1.3	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	36	194	0	5	0	241	145	0	0	0	0	0	111	2	95	0	829
7:15 AM	37	185	0	3	0	253	146	0	0	0	0	0	106	1	89	0	820
7:30 AM	30	211	0	2	0	270	141	0	0	0	0	0	90	1	88	0	833
7:45 AM	45	230	0	3	0	233	86	0	0	0	0	0	113	1	78	0	789
8:00 AM	35	176	0	0	0	248	123	0	0	0	0	0	94	0	64	0	740
8:15 AM	37	163	0	3	0	238	119	0	0	0	0	0	87	3	86	0	736
8:30 AM	48	184	0	2	0	225	114	0	0	0	0	0	81	0	96	0	750
8:45 AM	45	201	0	0	0	199	102	0	0	0	0	0	71	0	80	0	698
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	313	1544	0	18	0	1907	976	0	0	0	0	0	753	8	676	0	6195
APPROACH %'s :	16.69%	82.35%	0.00%	0.96%	0.00%	66.15%	33.85%	0.00%					52.40%	0.56%	47.04%	0.00%	
PEAK HR :	07:00 AM - 08:00 AM																TOTAL
PEAK HR VOL :	148	820	0	13	0	997	518	0	0	0	0	0	420	5	350	0	3271
PEAK HR FACTOR :	0.822	0.891	0.000	0.650	0.000	0.923	0.887	0.000	0.000	0.000	0.000	0.000	0.929	0.625	0.921	0.000	0.982
	0.882				0.922								0.931				

	S Riverside Ave				S Riverside Ave				I-10 WB Ramps				I-10 WB Ramps				
PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	2	3	0	0	0	4	1	0	0	0	0	0	1.3	0.3	1.3	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	58	356	0	0	0	266	102	0	0	0	0	0	93	1	127	0	1003
4:15 PM	51	343	0	1	0	252	104	0	0	0	0	0	90	0	118	0	959
4:30 PM	61	356	0	0	0	294	97	0	0	0	0	0	95	0	144	0	1047
4:45 PM	61	357	0	0	0	263	89	0	0	0	0	0	99	0	112	0	981
5:00 PM	60	374	0	0	0	301	92	0	0	0	0	0	114	0	109	0	1050
5:15 PM	59	385	0	0	0	261	96	0	0	0	0	0	116	2	143	0	1062
5:30 PM	49	368	0	0	0	266	105	0	0	0	0	0	121	1	119	0	1029
5:45 PM	52	361	0	0	0	244	84	0	0	0	0	0	113	0	98	0	952
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	451	2900	0	1	0	2147	769	0	0	0	0	0	841	4	970	0	8083
APPROACH %'s :	13.45%	86.52%	0.00%	0.03%	0.00%	73.63%	26.37%	0.00%					46.34%	0.22%	53.44%	0.00%	
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	241	1472	0	0	0	1119	374	0	0	0	0	0	424	2	508	0	4140
PEAK HR FACTOR :	0.988	0.956	0.000	0.000	0.000	0.929	0.964	0.000	0.000	0.000	0.000	0.000	0.914	0.250	0.882	0.000	0.975
	0.965				0.950								0.895				

National Data & Surveying Services Intersection Turning Movement Count

Location: S Riverside Ave & I-10 WB Ramps
City: Rialto
Control: Signalized

Project ID: Historical
Date: 4/12/2018

Cars

NS/EW Streets:	S Riverside Ave				S Riverside Ave				I-10 WB Ramps				I-10 WB Ramps				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	2	3	0	0	0	4	1	0	0	0	0	0	1.3	0.3	1.3	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	12	181	0	5	0	232	141	0	0	0	0	0	90	2	94	0	757
7:15 AM	9	168	0	3	0	245	146	0	0	0	0	0	88	1	87	0	747
7:30 AM	15	199	0	2	0	268	136	0	0	0	0	0	75	1	84	0	780
7:45 AM	19	221	0	3	0	227	84	0	0	0	0	0	97	1	72	0	724
8:00 AM	17	165	0	0	0	240	122	0	0	0	0	0	70	0	62	0	676
8:15 AM	11	145	0	3	0	225	113	0	0	0	0	0	46	3	81	0	627
8:30 AM	14	169	0	2	0	212	110	0	0	0	0	0	55	0	91	0	653
8:45 AM	19	184	0	0	0	179	97	0	0	0	0	0	57	0	80	0	616
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	116	1432	0	18	0	1828	949	0	0	0	0	0	578	8	651	0	5580
APPROACH %'s :	7.41%	91.44%	0.00%	1.15%	0.00%	65.83%	34.17%	0.00%					46.73%	0.65%	52.63%	0.00%	
PEAK HR :	07:00 AM - 08:00 AM																TOTAL
PEAK HR VOL :	55	769	0	13	0	972	507	0	0	0	0	0	350	5	337	0	3008
PEAK HR FACTOR :	0.72	0.870	0.000	0.650	0.000	0.907	0.868	0.000	0.000	0.000	0.000	0.000	0.902	0.625	0.896	0.000	0.964
	0.861				0.915								0.930				

	S Riverside Ave				S Riverside Ave				I-10 WB Ramps				I-10 WB Ramps				
PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	2	3	0	0	0	4	1	0	0	0	0	0	1.3	0.3	1.3	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	41	348	0	0	0	255	100	0	0	0	0	0	74	0	124	0	942
4:15 PM	38	332	0	0	0	240	101	0	0	0	0	0	61	0	114	0	886
4:30 PM	46	345	0	0	0	289	94	0	0	0	0	0	67	0	140	0	981
4:45 PM	48	346	0	0	0	256	85	0	0	0	0	0	79	0	108	0	922
5:00 PM	46	365	0	0	0	292	90	0	0	0	0	0	94	0	109	0	996
5:15 PM	49	375	0	0	0	254	94	0	0	0	0	0	105	2	140	0	1019
5:30 PM	39	363	0	0	0	258	101	0	0	0	0	0	101	1	115	0	978
5:45 PM	39	356	0	0	0	240	84	0	0	0	0	0	80	0	95	0	894
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	346	2830	0	0	0	2084	749	0	0	0	0	0	661	3	945	0	7618
APPROACH %'s :	10.89%	89.11%	0.00%	0.00%	0.00%	73.56%	26.44%	0.00%					41.08%	0.19%	58.73%	0.00%	
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	189	1431	0	0	0	1091	363	0	0	0	0	0	345	2	497	0	3918
PEAK HR FACTOR :	0.96	0.954	0.000	0.000	0.000	0.934	0.965	0.000	0.000	0.000	0.000	0.000	0.821	0.250	0.888	0.000	0.961
	0.955				0.949								0.854				

National Data & Surveying Services Intersection Turning Movement Count

Location: S Riverside Ave & I-10 WB Ramps
City: Rialto
Control: Signalized

Project ID: Historical
Date: 4/12/2018

2axle

NS/EW Streets:	S Riverside Ave				S Riverside Ave				I-10 WB Ramps				I-10 WB Ramps				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	2	3	0	0	0	4	1	0	0	0	0	0	1.3	0.3	1.3	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	6	4	0	0	0	7	1	0	0	0	0	0	5	0	1	0	24
7:15 AM	5	8	0	0	0	5	0	0	0	0	0	0	9	0	2	0	29
7:30 AM	4	6	0	0	0	1	3	0	0	0	0	0	4	0	3	0	21
7:45 AM	3	5	0	0	0	5	1	0	0	0	0	0	1	0	5	0	20
8:00 AM	2	4	0	0	0	3	0	0	0	0	0	0	2	0	2	0	13
8:15 AM	4	8	0	0	0	10	1	0	0	0	0	0	4	0	4	0	31
8:30 AM	7	3	0	0	0	11	1	0	0	0	0	0	3	0	4	0	29
8:45 AM	6	9	0	0	0	12	3	0	0	0	0	0	2	0	0	0	32
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	37	47	0	0	0	54	10	0	0	0	0	0	30	0	21	0	199
APPROACH %'s :	44.05%	55.95%	0.00%	0.00%	0.00%	84.38%	15.63%	0.00%					58.82%	0.00%	41.18%	0.00%	
PEAK HR :	07:00 AM - 08:00 AM																TOTAL
PEAK HR VOL :	18	23	0	0	0	18	5	0	0	0	0	0	19	0	11	0	94
PEAK HR FACTOR :	0.750	0.719	0.000	0.000	0.000	0.643	0.417	0.000	0.000	0.000	0.000	0.000	0.528	0.000	0.550	0.000	0.810
	0.788				0.719								0.682				

	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
PM	2	3	0	0	0	4	1	0	0	0	0	0	1.3	0.3	1.3	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	2	3	0	0	0	6	0	0	0	0	0	0	3	1	2	0	17
4:15 PM	0	1	0	0	0	9	3	0	0	0	0	0	5	0	2	0	20
4:30 PM	3	7	0	0	0	1	0	0	0	0	0	0	4	0	3	0	18
4:45 PM	2	6	0	0	0	4	0	0	0	0	0	0	4	0	3	0	19
5:00 PM	0	4	0	0	0	4	0	0	0	0	0	0	4	0	0	0	12
5:15 PM	1	8	0	0	0	1	2	0	0	0	0	0	2	0	1	0	15
5:30 PM	0	1	0	0	0	2	1	0	0	0	0	0	3	0	2	0	9
5:45 PM	1	2	0	0	0	3	0	0	0	0	0	0	4	0	1	0	11
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	9	32	0	0	0	30	6	0	0	0	0	0	29	1	14	0	121
APPROACH %'s :	21.95%	78.05%	0.00%	0.00%	0.00%	83.33%	16.67%	0.00%					65.91%	2.27%	31.82%	0.00%	
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	6	25	0	0	0	10	2	0	0	0	0	0	14	0	7	0	64
PEAK HR FACTOR :	0.50	0.781	0.000	0.000	0.000	0.625	0.250	0.000	0.000	0.000	0.000	0.000	0.875	0.000	0.583	0.000	0.842
	0.775				0.750								0.750				

National Data & Surveying Services Intersection Turning Movement Count

Location: S Riverside Ave & I-10 WB Ramps
City: Rialto
Control: Signalized

Project ID: Historical
Date: 4/12/2018

3axle

NS/EW Streets:	S Riverside Ave				S Riverside Ave				I-10 WB Ramps				I-10 WB Ramps				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	2	3	0	0	0	4	1	0	0	0	0	0	1.3	0.3	1.3	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	4	1	0	0	0	0	0	0	0	0	0	0	4	0	0	0	9
7:15 AM	6	1	0	0	0	1	0	0	0	0	0	0	1	0	0	0	9
7:30 AM	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
7:45 AM	2	2	0	0	0	1	0	0	0	0	0	0	2	0	0	0	7
8:00 AM	4	3	0	0	0	3	0	0	0	0	0	0	4	0	0	0	14
8:15 AM	5	4	0	0	0	1	0	0	0	0	0	0	4	0	0	0	14
8:30 AM	4	3	0	0	0	1	1	0	0	0	0	0	3	0	0	0	12
8:45 AM	4	3	0	0	0	3	0	0	0	0	0	0	3	0	0	0	13
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	34	17	0	0	0	10	1	0	0	0	0	0	21	0	0	0	83
APPROACH %'s :	66.67%	33.33%	0.00%	0.00%	0.00%	90.91%	9.09%	0.00%					100.00%	0.00%	0.00%	0.00%	
PEAK HR :	07:00 AM - 08:00 AM																TOTAL
PEAK HR VOL :	17	4	0	0	0	2	0	0	0	0	0	0	7	0	0	0	30
PEAK HR FACTOR :	0.708	0.500	0.000	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.438	0.000	0.000	0.000	0.833
	0.750				0.500								0.438				

	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
PM	2	3	0	0	0	4	1	0	0	0	0	0	1.3	0.3	1.3	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	5	0	0	0	0	0	1	0	0	0	0	0	2	0	0	0	8
4:15 PM	4	6	0	1	0	2	0	0	0	0	0	0	4	0	0	0	17
4:30 PM	3	1	0	0	0	1	2	0	0	0	0	0	2	0	1	0	10
4:45 PM	1	2	0	0	0	1	2	0	0	0	0	0	4	0	0	0	10
5:00 PM	3	2	0	0	0	2	1	0	0	0	0	0	1	0	0	0	9
5:15 PM	2	1	0	0	0	4	0	0	0	0	0	0	2	0	0	0	9
5:30 PM	2	1	0	0	0	1	2	0	0	0	0	0	0	0	0	0	6
5:45 PM	3	2	0	0	0	1	0	0	0	0	0	0	9	0	1	0	16
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	23	15	0	1	0	12	8	0	0	0	0	0	24	0	2	0	85
APPROACH %'s :	58.97%	38.46%	0.00%	2.56%	0.00%	60.00%	40.00%	0.00%					92.31%	0.00%	7.69%	0.00%	
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	9	6	0	0	0	8	5	0	0	0	0	0	9	0	1	0	38
PEAK HR FACTOR :	0.75	0.750	0.000	0.000	0.000	0.500	0.625	0.000	0.000	0.000	0.000	0.000	0.563	0.000	0.250	0.000	0.950
	0.750				0.813								0.625				

National Data & Surveying Services Intersection Turning Movement Count

Location: S Riverside Ave & I-10 WB Ramps
City: Rialto
Control: Signalized

Project ID: Historical
Date: 4/12/2018

4axle

NS/EW Streets:	S Riverside Ave				S Riverside Ave				I-10 WB Ramps				I-10 WB Ramps				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	2	3	0	0	0	4	1	0	0	0	0	0	1.3	0.3	1.3	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	14	8	0	0	0	2	3	0	0	0	0	0	12	0	0	0	39
7:15 AM	17	8	0	0	0	2	0	0	0	0	0	0	8	0	0	0	35
7:30 AM	6	6	0	0	0	1	2	0	0	0	0	0	11	0	1	0	27
7:45 AM	21	2	0	0	0	0	1	0	0	0	0	0	13	0	1	0	38
8:00 AM	12	4	0	0	0	2	1	0	0	0	0	0	18	0	0	0	37
8:15 AM	17	6	0	0	0	2	5	0	0	0	0	0	33	0	1	0	64
8:30 AM	23	9	0	0	0	1	2	0	0	0	0	0	20	0	1	0	56
8:45 AM	16	5	0	0	0	5	2	0	0	0	0	0	9	0	0	0	37
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	126	48	0	0	0	15	16	0	0	0	0	0	124	0	4	0	333
APPROACH %'s :	72.41%	27.59%	0.00%	0.00%	0.00%	48.39%	51.61%	0.00%					96.88%	0.00%	3.13%	0.00%	
PEAK HR :	07:00 AM - 08:00 AM																TOTAL
PEAK HR VOL :	58	24	0	0	0	5	6	0	0	0	0	0	44	0	2	0	139
PEAK HR FACTOR :	0.690	0.750	0.000	0.000	0.000	0.625	0.500	0.000	0.000	0.000	0.000	0.000	0.846	0.000	0.500	0.000	0.891
	0.820				0.550								0.821				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	2	3	0	0	0	4	1	0	0	0	0	0	1.3	0.3	1.3	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	10	5	0	0	0	5	1	0	0	0	0	0	14	0	1	0	36
4:15 PM	9	4	0	0	0	1	0	0	0	0	0	0	20	0	2	0	36
4:30 PM	9	3	0	0	0	3	1	0	0	0	0	0	22	0	0	0	38
4:45 PM	10	3	0	0	0	2	2	0	0	0	0	0	12	0	1	0	30
5:00 PM	11	3	0	0	0	3	1	0	0	0	0	0	15	0	0	0	33
5:15 PM	7	1	0	0	0	2	0	0	0	0	0	0	7	0	2	0	19
5:30 PM	8	3	0	0	0	5	1	0	0	0	0	0	17	0	2	0	36
5:45 PM	9	1	0	0	0	0	0	0	0	0	0	0	20	0	1	0	31
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	73	23	0	0	0	21	6	0	0	0	0	0	127	0	9	0	259
APPROACH %'s :	76.04%	23.96%	0.00%	0.00%	0.00%	77.78%	22.22%	0.00%					93.38%	0.00%	6.62%	0.00%	
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	37	10	0	0	0	10	4	0	0	0	0	0	56	0	3	0	120
PEAK HR FACTOR :	0.84	0.833	0.000	0.000	0.000	0.833	0.500	0.000	0.000	0.000	0.000	0.000	0.636	0.000	0.375	0.000	0.789
	0.839				0.875								0.670				

National Data & Surveying Services Intersection Turning Movement Count

Location: S Riverside Ave & I-10 EB Ramps
City: Rialto
Control: Signalized

Project ID: Historical
Date: 4/12/2018

Total

NS/EW Streets:	S Riverside Ave				S Riverside Ave				I-10 EB Ramps				I-10 EB Ramps				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	2.5	0.5	0	2	2	0	0	1.3	0.3	1.3	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	169	75	1	75	261	0	2	64	2	61	0	0	0	0	0	710
7:15 AM	0	156	51	0	106	271	0	0	72	4	70	0	0	0	0	0	730
7:30 AM	0	154	71	0	103	251	0	0	88	0	90	0	0	0	0	0	757
7:45 AM	0	188	71	0	89	263	0	0	88	1	102	0	0	0	0	0	802
8:00 AM	0	153	71	0	97	260	0	0	65	0	61	0	0	0	0	0	707
8:15 AM	0	141	80	0	94	240	0	0	73	0	79	0	0	0	0	0	707
8:30 AM	0	142	63	0	115	199	0	1	84	1	67	0	0	0	0	0	672
8:45 AM	0	181	112	0	85	187	0	0	78	1	61	0	0	0	0	0	705
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	1284	594	1	764	1932	0	3	612	9	591	0	0	0	0	0	5790
APPROACH %'s :	0.00%	68.33%	31.61%	0.05%	28.31%	71.58%	0.00%	0.11%	50.50%	0.74%	48.76%	0.00%					
PEAK HR :	07:00 AM - 08:00 AM																TOTAL
PEAK HR VOL :	0	667	268	1	373	1046	0	2	312	7	323	0	0	0	0	0	2999
PEAK HR FACTOR :	0.000	0.887	0.893	0.250	0.880	0.965	0.000	0.250	0.886	0.438	0.792	0.000	0.000	0.000	0.000	0.000	0.935
	0.903				0.942				0.840								

	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
PM	0	2.5	0.5	0	2	2	0	0	1.3	0.3	1.3	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	259	115	0	123	236	0	0	159	0	69	0	0	0	0	0	961
4:15 PM	0	255	141	0	118	218	0	0	140	0	73	0	0	0	0	0	945
4:30 PM	0	300	124	0	140	259	0	0	122	0	50	0	0	0	0	0	995
4:45 PM	0	289	116	0	103	266	0	0	126	1	50	0	0	0	0	0	951
5:00 PM	0	285	129	0	124	293	0	0	152	0	65	0	0	0	0	0	1048
5:15 PM	0	316	125	0	100	274	0	0	140	0	96	0	0	0	0	0	1051
5:30 PM	0	290	106	0	97	290	0	0	126	0	81	0	0	0	0	0	990
5:45 PM	0	279	131	0	115	265	0	1	146	0	64	0	0	0	0	0	1001
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	2273	987	0	920	2101	0	1	1111	1	548	0	0	0	0	0	7942
APPROACH %'s :	0.00%	69.72%	30.28%	0.00%	30.44%	69.52%	0.00%	0.03%	66.93%	0.06%	33.01%	0.00%					
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	0	1170	491	0	436	1122	0	1	564	0	306	0	0	0	0	0	4090
PEAK HR FACTOR :	0.000	0.926	0.937	0.000	0.879	0.957	0.000	0.250	0.928	0.000	0.797	0.000	0.000	0.000	0.000	0.000	0.973
	0.942				0.935				0.922								

National Data & Surveying Services Intersection Turning Movement Count

Location: S Riverside Ave & I-10 EB Ramps
City: Rialto
Control: Signalized

Project ID: Historical
Date: 4/12/2018

Cars

NS/EW Streets:	S Riverside Ave				S Riverside Ave				I-10 EB Ramps				I-10 EB Ramps				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	2.5	0.5	0	2	2	0	0	1.3	0.3	1.3	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	129	57	1	71	236	0	2	62	1	45	0	0	0	0	0	604
7:15 AM	0	120	35	0	102	249	0	0	66	3	56	0	0	0	0	0	631
7:30 AM	0	132	53	0	103	236	0	0	85	0	64	0	0	0	0	0	673
7:45 AM	0	153	50	0	86	242	0	0	86	1	81	0	0	0	0	0	699
8:00 AM	0	127	48	0	95	228	0	0	62	0	44	0	0	0	0	0	604
8:15 AM	0	104	50	0	85	196	0	0	63	0	58	0	0	0	0	0	556
8:30 AM	0	101	37	0	108	168	0	1	81	0	40	0	0	0	0	0	536
8:45 AM	0	141	66	0	80	158	0	0	71	1	31	0	0	0	0	0	548
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	1007	396	1	730	1713	0	3	576	6	419	0	0	0	0	0	4851
APPROACH %'s :	0.00%	71.72%	28.21%	0.07%	29.84%	70.03%	0.00%	0.12%	57.54%	0.60%	41.86%	0.00%					
PEAK HR :	07:00 AM - 08:00 AM																TOTAL
PEAK HR VOL :	0	534	195	1	362	963	0	2	299	5	246	0	0	0	0	0	2607
PEAK HR FACTOR :	0.00	0.873	0.855	0.250	0.879	0.967	0.000	0.250	0.869	0.417	0.759	0.000	0.000	0.000	0.000	0.000	0.932
	0.899				0.945				0.818								

	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
PM	0	2.5	0.5	0	2	2	0	0	1.3	0.3	1.3	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	239	97	0	120	208	0	0	157	0	53	0	0	0	0	0	874
4:15 PM	0	235	122	0	117	179	0	0	134	0	52	0	0	0	0	0	839
4:30 PM	0	281	103	0	139	228	0	0	114	0	31	0	0	0	0	0	896
4:45 PM	0	261	97	0	101	242	0	0	125	1	41	0	0	0	0	0	868
5:00 PM	0	270	110	0	122	268	0	0	149	0	44	0	0	0	0	0	963
5:15 PM	0	293	112	0	99	257	0	0	140	0	82	0	0	0	0	0	983
5:30 PM	0	279	93	0	96	261	0	0	124	0	64	0	0	0	0	0	917
5:45 PM	0	261	112	0	114	229	0	1	145	0	41	0	0	0	0	0	903
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	2119	846	0	908	1872	0	1	1088	1	408	0	0	0	0	0	7243
APPROACH %'s :	0.00%	71.47%	28.53%	0.00%	32.65%	67.31%	0.00%	0.04%	72.68%	0.07%	27.25%	0.00%					
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	0	1103	427	0	431	1015	0	1	558	0	231	0	0	0	0	0	3766
PEAK HR FACTOR :	0.00	0.941	0.953	0.000	0.883	0.947	0.000	0.250	0.936	0.000	0.704	0.000	0.000	0.000	0.000	0.000	0.958
	0.944				0.928				0.889								

National Data & Surveying Services **Intersection Turning Movement Count**

Location: S Riverside Ave & I-10 EB Ramps
City: Rialto
Control: Signalized

Project ID: Historical
Date: 4/12/2018

2axle

NS/EW Streets:	S Riverside Ave				S Riverside Ave				I-10 EB Ramps				I-10 EB Ramps				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	2.5	0.5	0	2	2	0	0	1.3	0.3	1.3	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	14	2	0	3	8	0	0	1	1	1	0	0	0	0	0	30
7:15 AM	0	4	3	0	2	11	0	0	6	1	2	0	0	0	0	0	29
7:30 AM	0	8	5	0	0	4	0	0	2	0	2	0	0	0	0	0	21
7:45 AM	0	8	2	0	3	4	0	0	0	0	6	0	0	0	0	0	23
8:00 AM	0	6	4	0	1	6	0	0	1	0	5	0	0	0	0	0	23
8:15 AM	0	7	5	0	6	8	0	0	6	0	2	0	0	0	0	0	34
8:30 AM	0	8	6	0	6	7	0	0	1	1	3	0	0	0	0	0	32
8:45 AM	0	10	24	0	4	10	0	0	4	0	3	0	0	0	0	0	55
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	65	51	0	25	58	0	0	21	3	24	0	0	0	0	0	247
APPROACH %'s :	0.00%	56.03%	43.97%	0.00%	30.12%	69.88%	0.00%	0.00%	43.75%	6.25%	50.00%	0.00%					
PEAK HR :	07:00 AM - 08:00 AM																TOTAL
PEAK HR VOL :	0	34	12	0	8	27	0	0	9	2	11	0	0	0	0	0	103
PEAK HR FACTOR :	0.000	0.607	0.600	0.000	0.667	0.614	0.000	0.000	0.375	0.500	0.458	0.000	0.000	0.000	0.000	0.000	0.858
	0.719				0.673				0.611								

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	2.5	0.5	0	2	2	0	0	1.3	0.3	1.3	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	6	4	0	1	8	0	0	0	0	4	0	0	0	0	0	23
4:15 PM	0	1	2	0	1	12	0	0	0	0	4	0	0	0	0	0	20
4:30 PM	0	7	0	0	0	4	0	0	4	0	3	0	0	0	0	0	18
4:45 PM	0	9	2	0	1	8	0	0	0	0	0	0	0	0	0	0	20
5:00 PM	0	1	0	0	1	7	0	0	1	0	2	0	0	0	0	0	12
5:15 PM	0	6	4	0	0	3	0	0	0	0	1	0	0	0	0	0	14
5:30 PM	0	2	2	0	0	6	0	0	1	0	1	0	0	0	0	0	12
5:45 PM	0	4	3	0	1	5	0	0	0	0	3	0	0	0	0	0	16
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	36	17	0	5	53	0	0	6	0	18	0	0	0	0	0	135
APPROACH %'s :	0.00%	67.92%	32.08%	0.00%	8.62%	91.38%	0.00%	0.00%	25.00%	0.00%	75.00%	0.00%					
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	0	13	9	0	2	21	0	0	2	0	7	0	0	0	0	0	54
PEAK HR FACTOR :	0.00	0.542	0.563	0.000	0.500	0.750	0.000	0.000	0.500	0.000	0.583	0.000	0.000	0.000	0.000	0.000	0.844
	0.550				0.719				0.750								

National Data & Surveying Services Intersection Turning Movement Count

Location: S Riverside Ave & I-10 EB Ramps
City: Rialto
Control: Signalized

Project ID: Historical
Date: 4/12/2018

3axle

NS/EW Streets:	S Riverside Ave				S Riverside Ave				I-10 EB Ramps				I-10 EB Ramps				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	2.5	0.5	0	2	2	0	0	1.3	0.3	1.3	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	4	1	0	0	6	0	0	1	0	3	0	0	0	0	0	15
7:15 AM	0	8	2	0	1	1	0	0	0	0	3	0	0	0	0	0	15
7:30 AM	0	4	2	0	0	0	0	0	0	0	2	0	0	0	0	0	8
7:45 AM	0	4	5	0	0	3	0	0	1	0	2	0	0	0	0	0	15
8:00 AM	0	7	2	0	0	6	0	0	1	0	3	0	0	0	0	0	19
8:15 AM	0	6	4	0	1	3	0	0	1	0	2	0	0	0	0	0	17
8:30 AM	0	7	0	0	0	4	0	0	1	0	3	0	0	0	0	0	15
8:45 AM	0	6	4	0	1	5	0	0	1	0	4	0	0	0	0	0	21
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	46	20	0	3	28	0	0	6	0	22	0	0	0	0	0	125
APPROACH %'s :	0.00%	69.70%	30.30%	0.00%	9.68%	90.32%	0.00%	0.00%	21.43%	0.00%	78.57%	0.00%					
PEAK HR :	07:00 AM - 08:00 AM																TOTAL
PEAK HR VOL :	0	20	10	0	1	10	0	0	2	0	10	0	0	0	0	0	53
PEAK HR FACTOR :	0.000	0.625	0.500	0.000	0.250	0.417	0.000	0.000	0.500	0.000	0.833	0.000	0.000	0.000	0.000	0.000	0.883
	0.750				0.458				0.750								

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	2.5	0.5	0	2	2	0	0	1.3	0.3	1.3	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	4	2	0	0	2	0	0	0	0	4	0	0	0	0	0	12
4:15 PM	0	6	3	0	0	7	0	0	3	0	6	0	0	0	0	0	25
4:30 PM	0	4	2	0	0	4	0	0	0	0	6	0	0	0	0	0	16
4:45 PM	0	4	1	0	0	3	0	0	0	0	0	0	0	0	0	0	8
5:00 PM	0	4	3	0	0	3	0	0	1	0	5	0	0	0	0	0	16
5:15 PM	0	5	1	0	0	6	0	0	0	0	2	0	0	0	0	0	14
5:30 PM	0	3	3	0	0	1	0	0	0	0	6	0	0	0	0	0	13
5:45 PM	0	3	3	0	0	10	0	0	1	0	5	0	0	0	0	0	22
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	33	18	0	0	36	0	0	5	0	34	0	0	0	0	0	126
APPROACH %'s :	0.00%	64.71%	35.29%	0.00%	0.00%	100.00%	0.00%	0.00%	12.82%	0.00%	87.18%	0.00%					
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	0	15	10	0	0	20	0	0	2	0	18	0	0	0	0	0	65
PEAK HR FACTOR :	0.00	0.750	0.833	0.000	0.000	0.500	0.000	0.000	0.500	0.000	0.750	0.000	0.000	0.000	0.000	0.000	0.739
	0.893				0.500				0.833								

National Data & Surveying Services Intersection Turning Movement Count

Location: S Riverside Ave & I-10 EB Ramps
City: Rialto
Control: Signalized

Project ID: Historical
Date: 4/12/2018

4axle

NS/EW Streets:	S Riverside Ave				S Riverside Ave				I-10 EB Ramps				I-10 EB Ramps				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	2.5	0.5	0	2	2	0	0	1.3	0.3	1.3	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	22	15	0	1	11	0	0	0	0	12	0	0	0	0	0	61
7:15 AM	0	24	11	0	1	10	0	0	0	0	9	0	0	0	0	0	55
7:30 AM	0	10	11	0	0	11	0	0	1	0	22	0	0	0	0	0	55
7:45 AM	0	23	14	0	0	14	0	0	1	0	13	0	0	0	0	0	65
8:00 AM	0	13	17	0	1	20	0	0	1	0	9	0	0	0	0	0	61
8:15 AM	0	24	21	0	2	33	0	0	3	0	17	0	0	0	0	0	100
8:30 AM	0	26	20	0	1	20	0	0	1	0	21	0	0	0	0	0	89
8:45 AM	0	24	18	0	0	14	0	0	2	0	23	0	0	0	0	0	81
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	166	127	0	6	133	0	0	9	0	126	0	0	0	0	0	567
APPROACH %'s :	0.00%	56.66%	43.34%	0.00%	4.32%	95.68%	0.00%	0.00%	6.67%	0.00%	93.33%	0.00%					
PEAK HR :	07:00 AM - 08:00 AM																TOTAL
PEAK HR VOL :	0	79	51	0	2	46	0	0	2	0	56	0	0	0	0	0	236
PEAK HR FACTOR :	0.000	0.823	0.850	0.000	0.500	0.821	0.000	0.000	0.500	0.000	0.636	0.000	0.000	0.000	0.000	0.000	0.908
	0.878				0.857				0.630								

	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
PM	0	2.5	0.5	0	2	2	0	0	1.3	0.3	1.3	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	10	12	0	2	18	0	0	2	0	8	0	0	0	0	0	52
4:15 PM	0	13	14	0	0	20	0	0	3	0	11	0	0	0	0	0	61
4:30 PM	0	8	19	0	1	23	0	0	4	0	10	0	0	0	0	0	65
4:45 PM	0	15	16	0	1	13	0	0	1	0	9	0	0	0	0	0	55
5:00 PM	0	10	16	0	1	15	0	0	1	0	14	0	0	0	0	0	57
5:15 PM	0	12	8	0	1	8	0	0	0	0	11	0	0	0	0	0	40
5:30 PM	0	6	8	0	1	22	0	0	1	0	10	0	0	0	0	0	48
5:45 PM	0	11	13	0	0	21	0	0	0	0	15	0	0	0	0	0	60
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	85	106	0	7	140	0	0	12	0	88	0	0	0	0	0	438
APPROACH %'s :	0.00%	44.50%	55.50%	0.00%	4.76%	95.24%	0.00%	0.00%	12.00%	0.00%	88.00%	0.00%					
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	0	39	45	0	3	66	0	0	2	0	50	0	0	0	0	0	205
PEAK HR FACTOR :	0.00	0.813	0.703	0.000	0.750	0.750	0.000	0.000	0.500	0.000	0.833	0.000	0.000	0.000	0.000	0.000	0.854
	0.808				0.750				0.867								

National Data & Surveying Services Intersection Turning Movement Count

Location: S Riverside Ave & Slover Ave
City: Bloomington
Control: Signalized

Project ID: Historical
Date: 4/12/2018

Total

NS/EW Streets:	S Riverside Ave				S Riverside Ave				Slover Ave				Slover Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	1	2	0	0	1	2	0	0	1	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	17	129	3	0	9	215	110	0	74	6	10	0	4	12	5	0	594
7:15 AM	17	145	7	0	10	246	88	0	47	2	3	0	5	2	5	0	577
7:30 AM	12	177	1	0	4	240	87	0	54	5	14	0	6	4	5	0	609
7:45 AM	15	191	4	1	4	254	90	0	51	5	13	0	4	3	6	0	641
8:00 AM	7	150	1	1	11	258	86	2	54	5	10	0	4	2	4	0	595
8:15 AM	8	161	2	3	16	243	48	0	48	8	11	0	4	4	6	0	562
8:30 AM	9	180	6	0	8	224	52	0	53	9	7	0	6	5	4	0	563
8:45 AM	9	213	3	1	5	196	40	0	48	13	10	0	5	7	3	0	553
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	94	1346	27	6	67	1876	601	2	429	53	78	0	38	39	38	0	4694
APPROACH %'s :	6.38%	91.38%	1.83%	0.41%	2.63%	73.68%	23.61%	0.08%	76.61%	9.46%	13.93%	0.00%	33.04%	33.91%	33.04%	0.00%	
PEAK HR :	07:15 AM - 08:15 AM																TOTAL
PEAK HR VOL :	51	663	13	2	29	998	351	2	206	17	40	0	19	11	20	0	2422
PEAK HR FACTOR :	0.750	0.868	0.464	0.500	0.659	0.967	0.975	0.250	0.954	0.850	0.714	0.000	0.792	0.688	0.833	0.000	0.945
	0.864				0.966				0.901				0.833				

	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
PM	1	2	0	0	1	2	0	0	1	2	0	0	1	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	6	273	2	1	5	219	66	0	109	46	28	0	10	2	25	0	792
4:15 PM	7	215	2	1	7	225	64	0	89	47	33	0	5	2	29	0	726
4:30 PM	2	290	4	0	8	239	79	0	84	32	36	0	4	4	25	0	807
4:45 PM	5	230	2	1	5	237	60	0	101	13	27	0	5	3	13	0	702
5:00 PM	2	302	1	3	3	313	44	0	86	38	31	0	2	7	9	0	841
5:15 PM	9	327	2	0	3	294	63	0	95	35	29	0	4	3	20	0	884
5:30 PM	7	261	6	3	2	301	58	0	106	11	25	0	4	1	10	0	795
5:45 PM	4	281	5	0	6	273	61	0	91	23	30	0	5	3	18	0	800
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	42	2179	24	9	39	2101	495	0	761	245	239	0	39	25	149	0	6347
APPROACH %'s :	1.86%	96.67%	1.06%	0.40%	1.48%	79.73%	18.79%	0.00%	61.12%	19.68%	19.20%	0.00%	18.31%	11.74%	69.95%	0.00%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	22	1171	14	6	14	1181	226	0	378	107	115	0	15	14	57	0	3320
PEAK HR FACTOR :	0.611	0.895	0.583	0.500	0.583	0.943	0.897	0.000	0.892	0.704	0.927	0.000	0.750	0.500	0.713	0.000	0.939
	0.897				0.984				0.943				0.796				

National Data & Surveying Services Intersection Turning Movement Count

Location: S Riverside Ave & Slover Ave
City: Bloomington
Control: Signalized

Project ID: Historical
Date: 4/12/2018

Cars

NS/EW Streets:	S Riverside Ave				S Riverside Ave				Slover Ave				Slover Ave				
	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
AM	1	2	0	0	1	2	0	0	1	2	0	0	1	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	11	97	2	0	7	181	105	0	69	5	6	0	3	10	4	0	500
7:15 AM	14	95	3	0	7	220	79	0	44	1	1	0	4	2	4	0	474
7:30 AM	10	141	0	0	3	209	79	0	45	5	8	0	4	3	2	0	509
7:45 AM	13	138	3	1	2	218	85	0	50	5	5	0	1	2	4	0	527
8:00 AM	4	113	0	1	6	222	78	2	45	4	6	0	2	1	0	0	484
8:15 AM	6	111	1	3	10	182	45	0	36	7	6	0	2	4	2	0	415
8:30 AM	7	114	3	0	5	178	44	0	39	7	6	0	4	1	1	0	409
8:45 AM	6	149	3	0	4	147	32	0	35	11	5	0	4	5	2	0	403
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	71	958	15	5	44	1557	547	2	363	45	43	0	24	28	19	0	3721
APPROACH %'s :	6.77%	91.33%	1.43%	0.48%	2.05%	72.42%	25.44%	0.09%	80.49%	9.98%	9.53%	0.00%	33.80%	39.44%	26.76%	0.00%	
PEAK HR :	07:15 AM - 08:15 AM																TOTAL
PEAK HR VOL :	41	487	6	2	18	869	321	2	184	15	20	0	11	8	10	0	1994
PEAK HR FACTOR :	0.73	0.863	0.500	0.500	0.643	0.979	0.944	0.250	0.920	0.750	0.625	0.000	0.688	0.667	0.625	0.000	0.946
	0.865				0.982				0.913				0.725				

	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
PM	1	2	0	0	1	2	0	0	1	2	0	0	1	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	4	232	0	1	3	185	56	0	103	44	21	0	6	1	23	0	679
4:15 PM	7	186	1	1	2	178	57	0	83	46	25	0	2	2	26	0	616
4:30 PM	1	257	2	0	5	208	63	0	76	28	24	0	2	2	23	0	691
4:45 PM	4	198	1	1	2	215	52	0	97	11	20	0	2	1	10	0	614
5:00 PM	2	277	1	3	0	279	38	0	79	37	25	0	0	1	7	0	749
5:15 PM	6	301	2	0	3	264	59	0	90	33	24	0	1	1	19	0	803
5:30 PM	6	240	4	3	1	261	52	0	102	10	23	0	2	1	8	0	713
5:45 PM	3	248	3	0	1	231	45	0	90	22	25	0	1	1	16	0	686
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	33	1939	14	9	17	1821	422	0	720	231	187	0	16	10	132	0	5551
APPROACH %'s :	1.65%	97.19%	0.70%	0.45%	0.75%	80.58%	18.67%	0.00%	63.27%	20.30%	16.43%	0.00%	10.13%	6.33%	83.54%	0.00%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	17	1066	10	6	5	1035	194	0	361	102	97	0	4	4	50	0	2951
PEAK HR FACTOR :	0.71	0.885	0.625	0.500	0.417	0.927	0.822	0.000	0.885	0.689	0.970	0.000	0.500	1.000	0.658	0.000	0.919
	0.889				0.946				0.952				0.690				

National Data & Surveying Services Intersection Turning Movement Count

Location: S Riverside Ave & Slover Ave
City: Bloomington
Control: Signalized

Project ID: Historical
Date: 4/12/2018

2axle

NS/EW Streets:	S Riverside Ave				S Riverside Ave				Slover Ave				Slover Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	1	2	0	0	1	2	0	0	1	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	1	9	0	0	1	5	3	0	2	1	0	0	1	1	0	0	24
7:15 AM	2	10	0	0	1	9	3	0	1	1	1	0	0	0	0	0	28
7:30 AM	0	5	0	0	0	3	4	0	5	0	0	0	1	0	1	0	19
7:45 AM	0	12	1	0	1	10	1	0	0	0	2	0	1	0	1	0	29
8:00 AM	1	6	0	0	1	9	0	0	1	1	0	0	0	0	1	0	20
8:15 AM	1	7	0	0	1	9	2	0	6	1	4	0	0	0	2	0	33
8:30 AM	1	9	0	0	1	8	1	0	7	0	0	0	0	3	1	0	31
8:45 AM	1	24	0	1	1	12	0	0	9	2	1	0	0	2	0	0	53
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	7	82	1	1	7	65	14	0	31	6	8	0	3	6	6	0	237
APPROACH %'s :	7.69%	90.11%	1.10%	1.10%	8.14%	75.58%	16.28%	0.00%	68.89%	13.33%	17.78%	0.00%	20.00%	40.00%	40.00%	0.00%	
PEAK HR :	07:15 AM - 08:15 AM																TOTAL
PEAK HR VOL :	3	33	1	0	3	31	8	0	7	2	3	0	2	0	3	0	96
PEAK HR FACTOR :	0.375	0.688	0.250	0.000	0.750	0.775	0.500	0.000	0.350	0.500	0.375	0.000	0.500	0.000	0.750	0.000	0.828
	0.712				0.808				0.600				0.625				

	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
PM	1	2	0	0	1	2	0	0	1	2	0	0	1	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	6	1	0	1	11	4	0	3	0	0	0	0	0	1	0	27
4:15 PM	0	3	0	0	0	13	1	0	1	1	0	0	0	0	2	0	21
4:30 PM	0	8	0	0	0	3	3	0	2	4	4	0	0	0	0	0	24
4:45 PM	0	4	0	0	1	6	0	0	0	0	0	0	0	0	0	0	11
5:00 PM	0	2	0	0	1	6	1	0	3	1	1	0	0	2	0	0	17
5:15 PM	2	4	0	0	0	3	1	0	1	1	0	0	0	0	0	0	12
5:30 PM	0	4	0	0	0	9	1	0	1	0	1	0	0	0	0	0	16
5:45 PM	0	5	0	0	2	5	3	0	1	0	0	0	1	0	1	0	18
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	2	36	1	0	5	56	14	0	12	7	6	0	1	2	4	0	146
APPROACH %'s :	5.13%	92.31%	2.56%	0.00%	6.67%	74.67%	18.67%	0.00%	48.00%	28.00%	24.00%	0.00%	14.29%	28.57%	57.14%	0.00%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	2	15	0	0	3	23	6	0	6	2	2	0	1	2	1	0	63
PEAK HR FACTOR :	0.25	0.750	0.000	0.000	0.375	0.639	0.500	0.000	0.500	0.500	0.500	0.000	0.250	0.250	0.250	0.000	0.875
	0.708				0.800				0.500				0.500				

National Data & Surveying Services Intersection Turning Movement Count

Location: S Riverside Ave & Slover Ave
City: Bloomington
Control: Signalized

Project ID: Historical
Date: 4/12/2018

3axle

NS/EW Streets:	S Riverside Ave				S Riverside Ave				Slover Ave				Slover Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	1	2	0	0	1	2	0	0	1	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	1	5	0	0	1	8	1	0	0	0	1	0	0	0	1	0	18
7:15 AM	1	7	0	0	0	3	0	0	2	0	0	0	0	0	0	0	13
7:30 AM	1	4	1	0	1	1	0	0	2	0	4	0	0	0	1	0	15
7:45 AM	0	6	0	0	1	4	0	0	0	0	3	0	1	1	1	0	17
8:00 AM	0	7	0	0	1	6	1	0	4	0	1	0	1	0	1	0	22
8:15 AM	0	8	0	0	0	5	0	0	1	0	1	0	0	0	1	0	16
8:30 AM	0	8	1	0	0	4	1	0	0	0	1	0	0	1	1	0	17
8:45 AM	0	8	0	0	0	6	3	0	1	0	0	0	0	0	0	0	18
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	3	53	2	0	4	37	6	0	10	0	11	0	2	2	6	0	136
APPROACH %'s :	5.17%	91.38%	3.45%	0.00%	8.51%	78.72%	12.77%	0.00%	47.62%	0.00%	52.38%	0.00%	20.00%	20.00%	60.00%	0.00%	
PEAK HR :	07:15 AM - 08:15 AM																TOTAL
PEAK HR VOL :	2	24	1	0	3	14	1	0	8	0	8	0	2	1	3	0	67
PEAK HR FACTOR :	0.500	0.857	0.250	0.000	0.750	0.583	0.250	0.000	0.500	0.000	0.500	0.000	0.500	0.250	0.750	0.000	0.761
	0.844				0.563				0.667				0.500				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	1	2	0	0	1	2	0	0	1	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	1	8	0	0	1	2	2	0	1	2	2	0	1	0	1	0	21
4:15 PM	0	6	0	0	0	11	2	0	3	0	4	0	0	0	0	0	26
4:30 PM	1	8	1	0	3	5	3	0	0	0	3	0	0	1	2	0	27
4:45 PM	1	5	0	0	0	2	0	0	1	0	4	0	2	1	1	0	17
5:00 PM	0	3	0	0	0	6	1	0	2	0	1	0	1	0	0	0	14
5:15 PM	1	7	0	0	0	9	0	0	2	0	3	0	0	1	0	0	23
5:30 PM	0	4	1	0	0	6	0	0	1	0	0	0	1	0	0	0	13
5:45 PM	0	5	0	0	2	10	5	0	0	0	1	0	2	1	0	0	26
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	4	46	2	0	6	51	13	0	10	2	18	0	7	4	4	0	167
APPROACH %'s :	7.69%	88.46%	3.85%	0.00%	8.57%	72.86%	18.57%	0.00%	33.33%	6.67%	60.00%	0.00%	46.67%	26.67%	26.67%	0.00%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	1	19	1	0	2	31	6	0	5	0	5	0	4	2	0	0	76
PEAK HR FACTOR :	0.25	0.679	0.250	0.000	0.250	0.775	0.300	0.000	0.625	0.000	0.417	0.000	0.500	0.500	0.000	0.000	0.731
	0.656				0.574				0.500				0.500				

National Data & Surveying Services Intersection Turning Movement Count

Location: S Riverside Ave & Slover Ave
City: Bloomington
Control: Signalized

Project ID: Historical
Date: 4/12/2018

4axle

NS/EW Streets:	S Riverside Ave				S Riverside Ave				Slover Ave				Slover Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	1	2	0	0	1	2	0	0	1	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	4	18	1	0	0	21	1	0	3	0	3	0	0	1	0	0	52
7:15 AM	0	33	4	0	2	14	6	0	0	0	1	0	1	0	1	0	62
7:30 AM	1	27	0	0	0	27	4	0	2	0	2	0	1	1	1	0	66
7:45 AM	2	35	0	0	0	22	4	0	1	0	3	0	1	0	0	0	68
8:00 AM	2	24	1	0	3	21	7	0	4	0	3	0	1	1	2	0	69
8:15 AM	1	35	1	0	5	47	1	0	5	0	0	0	2	0	1	0	98
8:30 AM	1	49	2	0	2	34	6	0	7	2	0	0	2	0	1	0	106
8:45 AM	2	32	0	0	0	31	5	0	3	0	4	0	1	0	1	0	79
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	13	253	9	0	12	217	34	0	25	2	16	0	9	3	7	0	600
APPROACH %'s :	4.73%	92.00%	3.27%	0.00%	4.56%	82.51%	12.93%	0.00%	58.14%	4.65%	37.21%	0.00%	47.37%	15.79%	36.84%	0.00%	
PEAK HR :	07:15 AM - 08:15 AM																TOTAL
PEAK HR VOL :	5	119	5	0	5	84	21	0	7	0	9	0	4	2	4	0	265
PEAK HR FACTOR :	0.625	0.850	0.313	0.000	0.417	0.778	0.750	0.000	0.438	0.000	0.750	0.000	1.000	0.500	0.500	0.000	0.960
	0.872				0.887				0.571				0.625				

	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
PM	1	2	0	0	1	2	0	0	1	2	0	0	1	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	1	27	1	0	0	21	4	0	2	0	5	0	3	1	0	0	65
4:15 PM	0	20	1	0	5	23	4	0	2	0	4	0	3	0	1	0	63
4:30 PM	0	17	1	0	0	23	10	0	6	0	5	0	2	1	0	0	65
4:45 PM	0	23	1	0	2	14	8	0	3	2	3	0	1	1	2	0	60
5:00 PM	0	20	0	0	2	22	4	0	2	0	4	0	1	4	2	0	61
5:15 PM	0	15	0	0	0	18	3	0	2	1	2	0	3	1	1	0	46
5:30 PM	1	13	1	0	1	25	5	0	2	1	1	0	1	0	2	0	53
5:45 PM	1	23	2	0	1	27	8	0	0	1	4	0	1	1	1	0	70
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	3	158	7	0	11	173	46	0	19	5	28	0	15	9	9	0	483
APPROACH %'s :	1.79%	94.05%	4.17%	0.00%	4.78%	75.22%	20.00%	0.00%	36.54%	9.62%	53.85%	0.00%	45.45%	27.27%	27.27%	0.00%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	2	71	3	0	4	92	20	0	6	3	11	0	6	6	6	0	230
PEAK HR FACTOR :	0.50	0.772	0.375	0.000	0.500	0.852	0.625	0.000	0.750	0.750	0.688	0.000	0.500	0.375	0.750	0.000	0.821
	0.731				0.806				0.833				0.643				

National Data & Surveying Services **Intersection Turning Movement Count**

Location: S Riverside Ave & Santa Ana Ave
City: Bloomington
Control: Signalized

Project ID: Historical
Date: 4/12/2018

Total

NS/EW Streets:	S Riverside Ave				S Riverside Ave				Santa Ana Ave				Santa Ana Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	3	0	0	0	3	0	0	0	1	0	0	0	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	24	160	3	0	13	196	23	0	7	7	14	0	4	3	10	0	464
7:15 AM	15	146	4	1	8	217	31	0	10	8	11	0	4	5	7	0	467
7:30 AM	14	185	1	0	4	222	23	0	14	7	9	0	2	3	7	0	491
7:45 AM	21	178	7	0	11	234	25	0	17	4	13	0	5	6	9	0	530
8:00 AM	13	154	6	0	2	231	26	0	13	2	16	0	2	2	7	0	474
8:15 AM	8	149	11	0	17	225	21	0	19	1	10	0	7	1	4	0	473
8:30 AM	12	162	7	0	19	193	18	1	15	1	9	0	8	4	12	0	461
8:45 AM	9	202	8	0	23	182	15	0	25	5	13	0	9	1	8	0	500
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	116	1336	47	1	97	1700	182	1	120	35	95	0	41	25	64	0	3860
APPROACH %'s :	7.73%	89.07%	3.13%	0.07%	4.90%	85.86%	9.19%	0.05%	48.00%	14.00%	38.00%	0.00%	31.54%	19.23%	49.23%	0.00%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	56	666	25	0	34	912	95	0	63	14	48	0	16	12	27	0	1968
PEAK HR FACTOR :	0.667	0.900	0.568	0.000	0.500	0.974	0.913	0.000	0.829	0.500	0.750	0.000	0.571	0.500	0.750	0.000	0.928
	0.907				0.964				0.919				0.688				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	3	0	0	0	3	0	0	0	1	0	0	0	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	16	244	6	0	9	234	18	0	19	6	26	0	10	6	11	0	605
4:15 PM	19	220	5	0	12	248	10	0	16	3	19	0	5	2	17	0	576
4:30 PM	21	202	6	0	7	261	13	0	18	1	18	0	12	1	15	0	575
4:45 PM	9	224	9	0	7	238	19	1	11	1	12	0	5	2	9	0	547
5:00 PM	22	274	4	0	5	296	19	0	24	5	21	0	7	3	23	0	703
5:15 PM	15	271	1	0	9	340	15	0	24	2	25	0	9	2	12	0	725
5:30 PM	18	269	3	0	7	309	15	0	23	2	15	0	7	5	10	0	683
5:45 PM	15	235	1	0	9	277	19	0	16	1	12	0	3	4	7	0	599
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	135	1939	35	0	65	2203	128	1	151	21	148	0	58	25	104	0	5013
APPROACH %'s :	6.40%	91.94%	1.66%	0.00%	2.71%	91.91%	5.34%	0.04%	47.19%	6.56%	46.25%	0.00%	31.02%	13.37%	55.61%	0.00%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	70	1049	9	0	30	1222	68	0	87	10	73	0	26	14	52	0	2710
PEAK HR FACTOR :	0.795	0.957	0.563	0.000	0.833	0.899	0.895	0.000	0.906	0.500	0.730	0.000	0.722	0.700	0.565	0.000	0.934
	0.940				0.907				0.833				0.697				

National Data & Surveying Services Intersection Turning Movement Count

Location: S Riverside Ave & Santa Ana Ave
City: Bloomington
Control: Signalized

Project ID: Historical
Date: 4/12/2018

Cars

NS/EW Streets:	S Riverside Ave				S Riverside Ave				Santa Ana Ave				Santa Ana Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	3	0	0	0	3	0	0	0	1	0	0	0	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	23	125	1	0	8	166	19	0	4	1	13	0	0	0	2	0	362
7:15 AM	14	109	2	1	7	189	29	0	8	2	9	0	1	2	0	0	373
7:30 AM	10	152	0	0	0	193	22	0	13	0	8	0	1	0	1	0	400
7:45 AM	18	137	3	0	7	201	18	0	12	0	11	0	1	0	1	0	409
8:00 AM	10	117	4	0	0	200	24	0	9	2	11	0	0	0	1	0	378
8:15 AM	6	111	2	0	5	172	17	0	14	1	9	0	2	0	2	0	341
8:30 AM	10	111	2	0	6	160	15	1	11	1	7	0	0	4	4	0	332
8:45 AM	8	159	3	0	11	139	14	0	9	3	10	0	2	1	1	0	360
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	99	1021	17	1	44	1420	158	1	80	10	78	0	7	7	12	0	2955
APPROACH %'s :	8.70%	89.72%	1.49%	0.09%	2.71%	87.49%	9.74%	0.06%	47.62%	5.95%	46.43%	0.00%	26.92%	26.92%	46.15%	0.00%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	44	517	9	0	12	766	81	0	48	3	39	0	4	0	5	0	1528
PEAK HR FACTOR :	0.61	0.850	0.563	0.000	0.429	0.953	0.844	0.000	0.857	0.375	0.886	0.000	0.500	0.000	0.625	0.000	0.934
	0.880				0.950				0.938				0.563				

	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
PM	0	3	0	0	0	3	0	0	0	1	0	0	0	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	15	214	5	0	4	199	15	0	16	6	19	0	7	4	7	0	511
4:15 PM	17	195	3	0	8	203	10	0	16	3	17	0	5	2	16	0	495
4:30 PM	19	182	5	0	5	220	10	0	15	1	17	0	9	1	13	0	497
4:45 PM	6	198	4	0	5	207	18	1	6	0	11	0	3	1	7	0	467
5:00 PM	20	254	3	0	2	265	16	0	21	4	18	0	6	3	21	0	633
5:15 PM	15	246	1	0	5	306	14	0	22	1	22	0	8	1	10	0	651
5:30 PM	15	247	0	0	4	273	13	0	21	1	12	0	3	3	8	0	600
5:45 PM	13	205	0	0	3	232	18	0	14	1	11	0	1	4	7	0	509
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	120	1741	21	0	36	1905	114	1	131	17	127	0	42	19	89	0	4363
APPROACH %'s :	6.38%	92.51%	1.12%	0.00%	1.75%	92.66%	5.54%	0.05%	47.64%	6.18%	46.18%	0.00%	28.00%	12.67%	59.33%	0.00%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	63	952	4	0	14	1076	61	0	78	7	63	0	18	11	46	0	2393
PEAK HR FACTOR :	0.79	0.937	0.333	0.000	0.700	0.879	0.847	0.000	0.886	0.438	0.716	0.000	0.563	0.688	0.548	0.000	0.919
	0.920				0.885				0.822				0.625				

National Data & Surveying Services Intersection Turning Movement Count

Location: S Riverside Ave & Santa Ana Ave
City: Bloomington
Control: Signalized

Project ID: Historical
Date: 4/12/2018

2axle

NS/EW Streets:	S Riverside Ave				S Riverside Ave				Santa Ana Ave				Santa Ana Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	3	0	0	0	3	0	0	0	1	0	0	0	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	10	0	0	0	8	1	0	1	0	0	0	0	0	1	0	21
7:15 AM	0	7	0	0	0	12	0	0	0	1	0	0	0	0	1	0	21
7:30 AM	4	8	0	0	1	5	0	0	0	1	0	0	0	0	0	0	19
7:45 AM	2	6	0	0	1	7	3	0	3	0	0	0	0	0	2	0	24
8:00 AM	1	5	0	0	0	7	1	0	1	0	2	0	0	0	0	0	17
8:15 AM	1	5	0	0	0	13	2	0	2	0	0	0	0	0	1	0	24
8:30 AM	1	7	0	0	0	7	0	0	4	0	0	0	0	0	0	0	19
8:45 AM	0	13	1	0	1	13	0	0	13	0	0	0	0	0	1	0	42
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	9	61	1	0	3	72	7	0	24	2	2	0	0	0	6	0	187
APPROACH %'s :	12.68%	85.92%	1.41%	0.00%	3.66%	87.80%	8.54%	0.00%	85.71%	7.14%	7.14%	0.00%	0.00%	0.00%	100.00%	0.00%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	8	24	0	0	2	32	6	0	6	1	2	0	0	0	3	0	84
PEAK HR FACTOR :	0.500	0.750	0.000	0.000	0.500	0.615	0.500	0.000	0.500	0.250	0.250	0.000	0.000	0.000	0.375	0.000	0.875
	0.667				0.667				0.750				0.375				

	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
PM	0	3	0	0	0	3	0	0	0	1	0	0	0	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	1	2	0	0	0	7	2	0	1	0	1	0	1	0	2	0	17
4:15 PM	0	2	0	0	0	11	0	0	0	0	0	0	0	0	0	0	13
4:30 PM	1	4	0	0	0	3	2	0	0	0	1	0	1	0	0	0	12
4:45 PM	0	4	0	0	1	6	1	0	0	0	0	0	0	0	0	0	12
5:00 PM	1	2	0	0	2	2	1	0	0	0	0	0	0	0	0	0	8
5:15 PM	0	3	0	0	1	6	1	0	0	0	0	0	0	0	1	0	12
5:30 PM	0	4	0	0	0	6	2	0	0	0	0	0	0	1	0	0	13
5:45 PM	0	5	0	0	0	7	0	0	0	0	0	0	0	0	0	0	12
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	3	26	0	0	4	48	9	0	1	0	2	0	2	1	3	0	99
APPROACH %'s :	10.34%	89.66%	0.00%	0.00%	6.56%	78.69%	14.75%	0.00%	33.33%	0.00%	66.67%	0.00%	33.33%	16.67%	50.00%	0.00%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	1	14	0	0	3	21	4	0	0	0	0	0	0	1	1	0	45
PEAK HR FACTOR :	0.25	0.700	0.000	0.000	0.375	0.750	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.250	0.000	0.865
	0.750				0.875								0.500				

National Data & Surveying Services Intersection Turning Movement Count

Location: S Riverside Ave & Santa Ana Ave
City: Bloomington
Control: Signalized

Project ID: Historical
Date: 4/12/2018

3axle

NS/EW Streets:	S Riverside Ave				S Riverside Ave				Santa Ana Ave				Santa Ana Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	3	0	0	0	3	0	0	0	1	0	0	0	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	1	2	1	0	1	3	1	0	0	5	0	0	2	0	2	0	18
7:15 AM	0	6	0	0	0	3	1	0	1	5	0	0	1	1	2	0	20
7:30 AM	0	7	0	0	0	2	0	0	0	4	0	0	1	0	0	0	14
7:45 AM	1	5	1	0	0	7	0	0	1	4	1	0	2	0	0	0	22
8:00 AM	0	8	1	0	1	5	0	0	1	0	2	0	0	0	1	0	19
8:15 AM	1	5	1	0	2	13	1	0	0	0	0	0	1	0	0	0	24
8:30 AM	0	6	1	0	2	5	1	0	0	0	1	0	1	0	1	0	18
8:45 AM	0	7	1	0	0	7	0	0	0	1	0	0	1	0	1	0	18
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	3	46	6	0	6	45	4	0	3	19	4	0	9	1	7	0	153
APPROACH %'s :	5.45%	83.64%	10.91%	0.00%	10.91%	81.82%	7.27%	0.00%	11.54%	73.08%	15.38%	0.00%	52.94%	5.88%	41.18%	0.00%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	2	25	3	0	3	27	1	0	2	8	3	0	4	0	1	0	79
PEAK HR FACTOR :	0.500	0.781	0.750	0.000	0.375	0.519	0.250	0.000	0.500	0.500	0.375	0.000	0.500	0.000	0.250	0.000	0.823
	0.833				0.484				0.542				0.625				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	3	0	0	0	3	0	0	0	1	0	0	0	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	5	0	0	1	6	0	0	0	0	1	0	1	1	1	0	16
4:15 PM	1	5	0	0	3	12	0	0	0	0	1	0	0	0	0	0	22
4:30 PM	0	4	0	0	1	6	0	0	0	0	0	0	1	0	0	0	12
4:45 PM	3	6	2	0	0	5	0	0	2	1	1	0	1	1	0	0	22
5:00 PM	0	5	1	0	1	10	0	0	0	1	1	0	1	0	0	0	20
5:15 PM	0	7	0	0	1	9	0	0	0	0	2	0	0	0	1	0	20
5:30 PM	1	4	0	0	2	6	0	0	0	1	0	0	3	1	0	0	18
5:45 PM	0	4	0	0	1	10	1	0	2	0	0	0	1	0	0	0	19
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	5	40	3	0	10	64	1	0	4	3	6	0	8	3	2	0	149
APPROACH %'s :	10.42%	83.33%	6.25%	0.00%	13.33%	85.33%	1.33%	0.00%	30.77%	23.08%	46.15%	0.00%	61.54%	23.08%	15.38%	0.00%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	1	20	1	0	5	35	1	0	2	2	3	0	5	1	1	0	77
PEAK HR FACTOR :	0.25	0.714	0.250	0.000	0.625	0.875	0.250	0.000	0.250	0.500	0.375	0.000	0.417	0.250	0.250	0.000	0.963
	0.786				0.854				0.875				0.438				

National Data & Surveying Services Intersection Turning Movement Count

Location: S Riverside Ave & Santa Ana Ave
City: Bloomington
Control: Signalized

Project ID: Historical
Date: 4/12/2018

4axle

NS/EW Streets:	S Riverside Ave				S Riverside Ave				Santa Ana Ave				Santa Ana Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	3	0	0	0	3	0	0	0	1	0	0	0	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	23	1	0	4	19	2	0	2	1	1	0	2	3	5	0	63
7:15 AM	1	24	2	0	1	13	1	0	1	0	2	0	2	2	4	0	53
7:30 AM	0	18	1	0	3	22	1	0	1	2	1	0	0	3	6	0	58
7:45 AM	0	30	3	0	3	19	4	0	1	0	1	0	2	6	6	0	75
8:00 AM	2	24	1	0	1	19	1	0	2	0	1	0	2	2	5	0	60
8:15 AM	0	28	8	0	10	27	1	0	3	0	1	0	4	1	1	0	84
8:30 AM	1	38	4	0	11	21	2	0	0	0	1	0	7	0	7	0	92
8:45 AM	1	23	3	0	11	23	1	0	3	1	3	0	6	0	5	0	80
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	5	208	23	0	44	163	13	0	13	4	11	0	25	17	39	0	565
APPROACH %'s :	2.12%	88.14%	9.75%	0.00%	20.00%	74.09%	5.91%	0.00%	46.43%	14.29%	39.29%	0.00%	30.86%	20.99%	48.15%	0.00%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	2	100	13	0	17	87	7	0	7	2	4	0	8	12	18	0	277
PEAK HR FACTOR :	0.250	0.833	0.406	0.000	0.425	0.806	0.438	0.000	0.583	0.250	1.000	0.000	0.500	0.500	0.750	0.000	0.824
	0.799				0.730				0.813				0.679				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	3	0	0	0	3	0	0	0	1	0	0	0	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	23	1	0	4	22	1	0	2	0	5	0	1	1	1	0	61
4:15 PM	1	18	2	0	1	22	0	0	0	0	1	0	0	0	1	0	46
4:30 PM	1	12	1	0	1	32	1	0	3	0	0	0	1	0	2	0	54
4:45 PM	0	16	3	0	1	20	0	0	3	0	0	0	1	0	2	0	46
5:00 PM	1	13	0	0	0	19	2	0	3	0	2	0	0	0	2	0	42
5:15 PM	0	15	0	0	2	19	0	0	2	1	1	0	1	1	0	0	42
5:30 PM	2	14	3	0	1	24	0	0	2	0	3	0	1	0	2	0	52
5:45 PM	2	21	1	0	5	28	0	0	0	0	1	0	1	0	0	0	59
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	7	132	11	0	15	186	4	0	15	1	13	0	6	2	10	0	402
APPROACH %'s :	4.67%	88.00%	7.33%	0.00%	7.32%	90.73%	1.95%	0.00%	51.72%	3.45%	44.83%	0.00%	33.33%	11.11%	55.56%	0.00%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	5	63	4	0	8	90	2	0	7	1	7	0	3	1	4	0	195
PEAK HR FACTOR :	0.63	0.750	0.333	0.000	0.400	0.804	0.250	0.000	0.583	0.250	0.583	0.000	0.750	0.250	0.500	0.000	0.826
	0.750				0.758				0.750				0.667				

National Data & Surveying Services Intersection Turning Movement Count

Location: S Riverside Ave & Industrial Dr
City: Bloomington
Control: 1-Way Stop (WB)

Project ID: Historical
Date: 4/12/2018

Total

NS/EW Streets:	S Riverside Ave				S Riverside Ave				Industrial Dr				Industrial Dr				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	2	0	0	0	2	0	0	0	0	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	174	0	0	8	189	0	0	0	0	0	0	0	0	8	0	379
7:15 AM	0	160	2	0	5	226	0	0	0	0	0	0	0	0	2	0	395
7:30 AM	0	201	2	0	6	233	0	0	0	0	0	0	0	0	3	0	445
7:45 AM	0	194	1	0	6	232	0	0	0	0	0	0	0	0	4	0	437
8:00 AM	0	177	0	0	9	217	0	0	0	0	0	0	0	0	7	0	410
8:15 AM	0	143	0	0	13	236	0	0	0	0	0	0	1	0	11	0	404
8:30 AM	0	173	0	0	10	187	0	0	0	0	0	0	1	0	7	0	378
8:45 AM	0	217	2	0	6	181	0	0	0	0	0	0	1	0	6	0	413
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	1439	7	0	63	1701	0	0	0	0	0	0	3	0	48	0	3261
APPROACH %'s :	0.00%	99.52%	0.48%	0.00%	3.57%	96.43%	0.00%	0.00%					5.88%	0.00%	94.12%	0.00%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	0	715	3	0	34	918	0	0	0	0	0	0	1	0	25	0	1696
PEAK HR FACTOR :	0.000	0.889	0.375	0.000	0.654	0.972	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.568	0.000	0.953
	0.884				0.956								0.542				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	2	0	0	0	2	0	0	0	0	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	250	1	0	8	254	0	0	0	0	0	0	1	0	6	0	520
4:15 PM	0	231	2	0	7	274	0	0	0	0	0	0	0	0	11	0	525
4:30 PM	0	204	2	0	5	268	0	0	0	0	0	0	0	0	18	0	497
4:45 PM	0	239	0	0	3	278	0	0	0	0	0	0	2	0	6	0	528
5:00 PM	0	266	0	0	3	309	0	1	0	0	0	0	1	0	10	0	590
5:15 PM	0	271	2	0	5	379	0	0	0	0	0	0	2	0	2	0	661
5:30 PM	0	273	2	0	7	335	0	0	0	0	0	0	0	0	3	0	620
5:45 PM	0	237	3	0	3	305	0	0	0	0	0	0	0	0	7	0	555
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	1971	12	0	41	2402	0	1	0	0	0	0	6	0	63	0	4496
APPROACH %'s :	0.00%	99.39%	0.61%	0.00%	1.68%	98.28%	0.00%	0.04%					8.70%	0.00%	91.30%	0.00%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	0	1047	7	0	18	1328	0	1	0	0	0	0	3	0	22	0	2426
PEAK HR FACTOR :	0.000	0.959	0.583	0.000	0.643	0.876	0.000	0.250	0.000	0.000	0.000	0.000	0.375	0.000	0.550	0.000	0.918
	0.958				0.877								0.568				

National Data & Surveying Services Intersection Turning Movement Count

Location: S Riverside Ave & Industrial Dr
City: Bloomington
Control: 1-Way Stop (WB)

Project ID: Historical
Date: 4/12/2018

Cars

NS/EW Streets:	S Riverside Ave				S Riverside Ave				Industrial Dr				Industrial Dr				
	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
AM	0	2	0	0	0	2	0	0	0	0	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	139	0	0	5	155	0	0	0	0	0	0	0	0	4	0	303
7:15 AM	0	125	1	0	4	196	0	0	0	0	0	0	0	0	0	0	326
7:30 AM	0	169	2	0	4	202	0	0	0	0	0	0	0	0	1	0	378
7:45 AM	0	149	1	0	3	200	0	0	0	0	0	0	0	0	2	0	355
8:00 AM	0	137	0	0	5	186	0	0	0	0	0	0	0	0	4	0	332
8:15 AM	0	99	0	0	8	185	0	0	0	0	0	0	1	0	5	0	298
8:30 AM	0	117	0	0	4	146	0	0	0	0	0	0	0	0	4	0	271
8:45 AM	0	172	1	0	3	135	0	0	0	0	0	0	0	0	0	0	311
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	1107	5	0	36	1405	0	0	0	0	0	0	1	0	20	0	2574
APPROACH %'s :	0.00%	99.55%	0.45%	0.00%	2.50%	97.50%	0.00%	0.00%					4.76%	0.00%	95.24%	0.00%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	0	554	3	0	20	773	0	0	0	0	0	0	1	0	12	0	1363
PEAK HR FACTOR :	0.00	0.820	0.375	0.000	0.625	0.957	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.600	0.000	0.901
	0.814				0.962								0.542				

	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
PM	0	2	0	0	0	2	0	0	0	0	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	227	0	0	4	216	0	0	0	0	0	0	1	0	3	0	451
4:15 PM	0	200	2	0	1	224	0	0	0	0	0	0	0	0	8	0	435
4:30 PM	0	184	2	0	2	235	0	0	0	0	0	0	0	0	16	0	439
4:45 PM	0	210	0	0	0	244	0	0	0	0	0	0	2	0	3	0	459
5:00 PM	0	246	0	0	2	275	0	1	0	0	0	0	1	0	10	0	535
5:15 PM	0	248	2	0	3	340	0	0	0	0	0	0	2	0	0	0	595
5:30 PM	0	248	2	0	2	298	0	0	0	0	0	0	0	0	2	0	552
5:45 PM	0	207	2	0	2	261	0	0	0	0	0	0	0	0	2	0	474
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	1770	10	0	16	2093	0	1	0	0	0	0	6	0	44	0	3940
APPROACH %'s :	0.00%	99.44%	0.56%	0.00%	0.76%	99.19%	0.00%	0.05%					12.00%	0.00%	88.00%	0.00%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	0	949	6	0	9	1174	0	1	0	0	0	0	3	0	14	0	2156
PEAK HR FACTOR :	0.00	0.957	0.750	0.000	0.750	0.863	0.000	0.250	0.000	0.000	0.000	0.000	0.375	0.000	0.350	0.000	0.906
	0.955				0.863								0.386				

National Data & Surveying Services Intersection Turning Movement Count

Location: S Riverside Ave & Industrial Dr
City: Bloomington
Control: 1-Way Stop (WB)

Project ID: Historical
Date: 4/12/2018

2axle

NS/EW Streets:	S Riverside Ave				S Riverside Ave				Industrial Dr				Industrial Dr				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	2	0	0	0	2	0	0	0	0	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	8	0	0	0	7	0	0	0	0	0	0	0	0	0	0	15
7:15 AM	0	7	0	0	0	9	0	0	0	0	0	0	0	0	0	0	16
7:30 AM	0	9	0	0	0	6	0	0	0	0	0	0	0	0	0	0	15
7:45 AM	0	8	0	0	0	7	0	0	0	0	0	0	0	0	0	0	15
8:00 AM	0	6	0	0	0	6	0	0	0	0	0	0	0	0	0	0	12
8:15 AM	0	7	0	0	0	9	0	0	0	0	0	0	0	0	0	0	16
8:30 AM	0	7	0	0	0	7	0	0	0	0	0	0	0	0	0	0	14
8:45 AM	0	11	1	0	1	10	0	0	0	0	0	0	0	0	1	0	24
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	63	1	0	1	61	0	0	0	0	0	0	0	0	1	0	127
APPROACH %'s :	0.00%	98.44%	1.56%	0.00%	1.61%	98.39%	0.00%	0.00%					0.00%	0.00%	100.00%	0.00%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	0	30	0	0	0	28	0	0	0	0	0	0	0	0	0	0	58
PEAK HR FACTOR :	0.000	0.833	0.000	0.000	0.000	0.778	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.906
	0.833				0.778												

	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
PM	0	2	0	0	0	2	0	0	0	0	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	3	0	0	1	8	0	0	0	0	0	0	0	0	0	0	12
4:15 PM	0	5	0	0	0	13	0	0	0	0	0	0	0	0	0	0	18
4:30 PM	0	6	0	0	1	4	0	0	0	0	0	0	0	0	0	0	11
4:45 PM	0	3	0	0	0	7	0	0	0	0	0	0	0	0	0	0	10
5:00 PM	0	4	0	0	0	3	0	0	0	0	0	0	0	0	0	0	7
5:15 PM	0	4	0	0	0	7	0	0	0	0	0	0	0	0	0	0	11
5:30 PM	0	4	0	0	0	5	0	0	0	0	0	0	0	0	0	0	9
5:45 PM	0	5	0	0	0	6	0	0	0	0	0	0	0	0	0	0	11
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	34	0	0	2	53	0	0	0	0	0	0	0	0	0	0	89
APPROACH %'s :	0.00%	100.00%	0.00%	0.00%	3.64%	96.36%	0.00%	0.00%									
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	0	17	0	0	0	21	0	0	0	0	0	0	0	0	0	0	38
PEAK HR FACTOR :	0.00	0.850	0.000	0.000	0.000	0.750	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.864
	0.850				0.750												

National Data & Surveying Services Intersection Turning Movement Count

Location: S Riverside Ave & Industrial Dr
City: Bloomington
Control: 1-Way Stop (WB)

Project ID: Historical
Date: 4/12/2018

3axle

NS/EW Streets:	S Riverside Ave				S Riverside Ave				Industrial Dr				Industrial Dr				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	2	0	0	0	2	0	0	0	0	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	4	0	0	0	4	0	0	0	0	0	0	0	0	2	0	10
7:15 AM	0	6	0	0	0	6	0	0	0	0	0	0	0	0	0	0	12
7:30 AM	0	8	0	0	1	4	0	0	0	0	0	0	0	0	1	0	14
7:45 AM	0	6	0	0	0	8	0	0	0	0	0	0	0	0	0	0	14
8:00 AM	0	9	0	0	3	5	0	0	0	0	0	0	0	0	1	0	18
8:15 AM	0	4	0	0	0	13	0	0	0	0	0	0	0	0	2	0	19
8:30 AM	0	7	0	0	1	6	0	0	0	0	0	0	0	0	0	0	14
8:45 AM	0	8	0	0	0	6	0	0	0	0	0	0	0	0	1	0	15
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	52	0	0	5	52	0	0	0	0	0	0	0	0	7	0	116
APPROACH %'s :	0.00%	100.00%	0.00%	0.00%	8.77%	91.23%	0.00%	0.00%					0.00%	0.00%	100.00%	0.00%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	0	27	0	0	4	30	0	0	0	0	0	0	0	0	4	0	65
PEAK HR FACTOR :	0.000	0.750	0.000	0.000	0.333	0.577	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.500	0.000	0.855
	0.750				0.654								0.500				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	2	0	0	0	2	0	0	0	0	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	3	0	0	0	7	0	0	0	0	0	0	0	0	1	0	11
4:15 PM	0	7	0	0	1	13	0	0	0	0	0	0	0	0	1	0	22
4:30 PM	0	3	0	0	0	5	0	0	0	0	0	0	0	0	0	0	8
4:45 PM	0	7	0	0	2	6	0	0	0	0	0	0	0	0	2	0	17
5:00 PM	0	5	0	0	0	11	0	0	0	0	0	0	0	0	0	0	16
5:15 PM	0	6	0	0	0	11	0	0	0	0	0	0	0	0	1	0	18
5:30 PM	0	4	0	0	1	9	0	0	0	0	0	0	0	0	1	0	15
5:45 PM	0	4	0	0	1	8	0	0	0	0	0	0	0	0	2	0	15
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	39	0	0	5	70	0	0	0	0	0	0	0	0	8	0	122
APPROACH %'s :	0.00%	100.00%	0.00%	0.00%	6.67%	93.33%	0.00%	0.00%					0.00%	0.00%	100.00%	0.00%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	0	19	0	0	2	39	0	0	0	0	0	0	0	0	4	0	64
PEAK HR FACTOR :	0.00	0.792	0.000	0.000	0.500	0.886	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.500	0.000	0.889
	0.792				0.932								0.500				

National Data & Surveying Services Intersection Turning Movement Count

Location: S Riverside Ave & Industrial Dr
City: Bloomington
Control: 1-Way Stop (WB)

Project ID: Historical
Date: 4/12/2018

4axle

NS/EW Streets:	S Riverside Ave				S Riverside Ave				Industrial Dr				Industrial Dr				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	2	0	0	0	2	0	0	0	0	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	23	0	0	3	23	0	0	0	0	0	0	0	0	2	0	51
7:15 AM	0	22	1	0	1	15	0	0	0	0	0	0	0	0	2	0	41
7:30 AM	0	15	0	0	1	21	0	0	0	0	0	0	0	0	1	0	38
7:45 AM	0	31	0	0	3	17	0	0	0	0	0	0	0	0	2	0	53
8:00 AM	0	25	0	0	1	20	0	0	0	0	0	0	0	0	2	0	48
8:15 AM	0	33	0	0	5	29	0	0	0	0	0	0	0	0	4	0	71
8:30 AM	0	42	0	0	5	28	0	0	0	0	0	0	1	0	3	0	79
8:45 AM	0	26	0	0	2	30	0	0	0	0	0	0	1	0	4	0	63
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	217	1	0	21	183	0	0	0	0	0	0	2	0	20	0	444
APPROACH %'s :	0.00%	99.54%	0.46%	0.00%	10.29%	89.71%	0.00%	0.00%					9.09%	0.00%	90.91%	0.00%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	0	104	0	0	10	87	0	0	0	0	0	0	0	0	9	0	210
PEAK HR FACTOR :	0.000	0.788	0.000	0.000	0.500	0.750	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.563	0.000	0.739
	0.788				0.713								0.563				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	2	0	0	0	2	0	0	0	0	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	17	1	0	3	23	0	0	0	0	0	0	0	0	2	0	46
4:15 PM	0	19	0	0	5	24	0	0	0	0	0	0	0	0	2	0	50
4:30 PM	0	11	0	0	2	24	0	0	0	0	0	0	0	0	2	0	39
4:45 PM	0	19	0	0	1	21	0	0	0	0	0	0	0	0	1	0	42
5:00 PM	0	11	0	0	1	20	0	0	0	0	0	0	0	0	0	0	32
5:15 PM	0	13	0	0	2	21	0	0	0	0	0	0	0	0	1	0	37
5:30 PM	0	17	0	0	4	23	0	0	0	0	0	0	0	0	0	0	44
5:45 PM	0	21	1	0	0	30	0	0	0	0	0	0	0	0	3	0	55
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	128	2	0	18	186	0	0	0	0	0	0	0	0	11	0	345
APPROACH %'s :	0.00%	98.46%	1.54%	0.00%	8.82%	91.18%	0.00%	0.00%					0.00%	0.00%	100.00%	0.00%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	0	62	1	0	7	94	0	0	0	0	0	0	0	0	4	0	168
PEAK HR FACTOR :	0.00	0.738	0.250	0.000	0.438	0.783	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.333	0.000	0.764
	0.716				0.842								0.333				

Prepared by National Data & Surveying Services

S Riverside Ave & S Jurupa Ave

Peak Hour Turning Movement Count

ID: 18-06047-007
City: Bloomington

Day: Thursday
Date: 04/12/2018

PEAK HOURS	COUNT PERIODS
07:15 AM - 08:15 AM	07:00 AM - 09:00 AM
NONE	NONE
05:00 PM - 06:00 PM	04:00 PM - 06:00 PM

S Riverside Ave – SOUTHBOUND

	↲	↓	↳	U	⇧
AM	44	879	0	0	736
NOON	0	0	0	0	0
PM	39	1290	0	0	1052
	0	2	0	0	

S Jurupa Ave – EASTBOUND

	AM	NOON	PM	
⇦	119	0	117	
U-turn	0	0	0	0
Left	32	0	29	1
Through	0	0	0	0
Right	79	0	137	1

S Jurupa Ave – WESTBOUND

		PM	NOON	AM
Right	0	0	0	0
Through	0	0	0	0
Left	0	0	0	0
U-turn	0	0	0	0
⇨		0	0	0

CONTROL

Signalized

	AM	NOON	PM
TEV	1816	0	2598
PHF	0.95		0.90

S Riverside Ave – NORTHBOUND

		U-turn	Left	Through	Right
		0	1	2	0
PM	1429	2	78	1023	0
NOON	0	0	0	0	0
AM	961	3	75	704	0

Cars (AM)

Approach	Values
Southbound	41, 761, 0
Eastbound	27, 0, 62
Westbound	0, 0, 0
Northbound	64, 560, 0

Cars (NOON)

Approach	Values
Southbound	N/A, N/A, N/A
Eastbound	N/A, N/A, N/A
Westbound	N/A, N/A, N/A
Northbound	N/A, N/A, N/A

Cars (PM)

Approach	Values
Southbound	33, 1149, 0
Eastbound	29, 0, 130
Westbound	0, 0, 0
Northbound	68, 935, 0

2axle (AM)

Approach	Values
Southbound	1, 24, 0
Eastbound	2, 0, 5
Westbound	0, 0, 0
Northbound	4, 30, 0

2axle (NOON)

Approach	Values
Southbound	N/A, N/A, N/A
Eastbound	N/A, N/A, N/A
Westbound	N/A, N/A, N/A
Northbound	N/A, N/A, N/A

2axle (PM)

Approach	Values
Southbound	4, 12, 0
Eastbound	0, 0, 0
Westbound	0, 0, 0
Northbound	1, 13, 0

Pedestrians (Crosswalks)

Crosswalk	PM	NOON	AM
North leg	0	0	0
South leg	0	0	0
West leg	0	0	0
East leg	0	0	0
NW corner diagonal	0	0	0
NE corner diagonal	0	0	0
SW corner diagonal	0	0	0
SE corner diagonal	0	0	0

National Data & Surveying Services **Intersection Turning Movement Count**

Location: S Riverside Ave & S Jurupa Ave
City: Bloomington
Control: Signalized

Project ID: 18-06047-007
Date: 4/12/2018

Total

NS/EW Streets:	S Riverside Ave				S Riverside Ave				S Jurupa Ave				S Jurupa Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	0	2	0	0	1	0	1	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	19	178	0	0	0	174	9	0	5	0	20	0	0	0	0	0	405
7:15 AM	22	161	0	0	0	207	12	0	4	0	13	0	0	0	0	0	419
7:30 AM	21	181	0	2	0	227	11	0	6	0	18	0	0	0	0	0	466
7:45 AM	16	197	0	1	0	225	10	0	9	0	19	0	0	0	0	0	477
8:00 AM	16	165	0	0	0	220	11	0	13	0	29	0	0	0	0	0	454
8:15 AM	14	138	0	0	0	218	7	0	9	0	13	0	0	0	0	0	399
8:30 AM	17	155	0	0	0	192	8	0	7	0	26	0	0	0	0	0	405
8:45 AM	17	192	0	0	0	165	9	0	15	0	23	0	0	0	0	0	421
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	142	1367	0	3	0	1628	77	0	68	0	161	0	0	0	0	0	3446
APPROACH %'s :	9.39%	90.41%	0.00%	0.20%	0.00%	95.48%	4.52%	0.00%	29.69%	0.00%	70.31%	0.00%					
PEAK HR :	07:15 AM - 08:15 AM																TOTAL
PEAK HR VOL :	75	704	0	3	0	879	44	0	32	0	79	0	0	0	0	0	1816
PEAK HR FACTOR :	0.852	0.893	0.000	0.375	0.000	0.968	0.917	0.000	0.615	0.000	0.681	0.000	0.000	0.000	0.000	0.000	0.952
	0.914				0.970				0.661								

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	0	2	0	0	1	0	1	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	23	239	0	2	0	261	14	0	14	0	36	0	0	0	0	0	589
4:15 PM	17	208	0	2	0	265	14	0	17	0	46	0	0	0	0	0	569
4:30 PM	11	186	0	0	0	258	9	0	9	0	42	0	0	0	0	0	515
4:45 PM	20	226	0	0	0	246	15	0	10	0	22	0	0	0	0	0	539
5:00 PM	22	238	0	0	0	289	8	0	12	0	39	0	0	0	0	0	608
5:15 PM	14	291	0	1	0	364	13	0	4	0	31	0	0	0	0	0	718
5:30 PM	22	252	0	1	0	355	8	0	4	0	41	0	0	0	0	0	683
5:45 PM	20	242	0	0	0	282	10	0	9	0	26	0	0	0	0	0	589
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	149	1882	0	6	0	2320	91	0	79	0	283	0	0	0	0	0	4810
APPROACH %'s :	7.31%	92.39%	0.00%	0.29%	0.00%	96.23%	3.77%	0.00%	21.82%	0.00%	78.18%	0.00%					
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	78	1023	0	2	0	1290	39	0	29	0	137	0	0	0	0	0	2598
PEAK HR FACTOR :	0.886	0.879	0.000	0.500	0.000	0.886	0.750	0.000	0.604	0.000	0.835	0.000	0.000	0.000	0.000	0.000	0.905
	0.901				0.881				0.814								

National Data & Surveying Services **Intersection Turning Movement Count**

Location: S Riverside Ave & S Jurupa Ave
City: Bloomington
Control: Signalized

Project ID: 18-06047-007
Date: 4/12/2018

Cars

NS/EW Streets:	S Riverside Ave				S Riverside Ave				S Jurupa Ave				S Jurupa Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	0	2	0	0	1	0	1	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	19	141	0	0	0	143	9	0	4	0	15	0	0	0	0	0	331
7:15 AM	20	127	0	0	0	178	12	0	3	0	10	0	0	0	0	0	350
7:30 AM	17	152	0	0	0	198	10	0	6	0	14	0	0	0	0	0	397
7:45 AM	14	152	0	1	0	194	10	0	7	0	15	0	0	0	0	0	393
8:00 AM	13	129	0	0	0	191	9	0	11	0	23	0	0	0	0	0	376
8:15 AM	12	97	0	0	0	171	6	0	8	0	10	0	0	0	0	0	304
8:30 AM	15	103	0	0	0	148	8	0	5	0	12	0	0	0	0	0	291
8:45 AM	16	147	0	0	0	122	8	0	11	0	14	0	0	0	0	0	318
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	126	1048	0	1	0	1345	72	0	55	0	113	0	0	0	0	0	2760
APPROACH %'s :	10.72%	89.19%	0.00%	0.09%	0.00%	94.92%	5.08%	0.00%	32.74%	0.00%	67.26%	0.00%					
PEAK HR :	07:15 AM - 08:15 AM																TOTAL
PEAK HR VOL :	64	560	0	1	0	761	41	0	27	0	62	0	0	0	0	0	1516
PEAK HR FACTOR :	0.80	0.921	0.000	0.250	0.000	0.961	0.854	0.000	0.614	0.000	0.674	0.000	0.000	0.000	0.000	0.000	0.955
	0.925				0.964				0.654								

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	0	2	0	0	1	0	1	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	20	215	0	2	0	224	14	0	13	0	31	0	0	0	0	0	519
4:15 PM	12	179	0	2	0	224	12	0	17	0	41	0	0	0	0	0	487
4:30 PM	7	166	0	0	0	226	8	0	9	0	38	0	0	0	0	0	454
4:45 PM	16	197	0	0	0	219	12	0	9	0	21	0	0	0	0	0	474
5:00 PM	18	218	0	0	0	258	8	0	12	0	36	0	0	0	0	0	550
5:15 PM	13	270	0	1	0	329	9	0	4	0	27	0	0	0	0	0	653
5:30 PM	19	230	0	1	0	319	8	0	4	0	41	0	0	0	0	0	622
5:45 PM	18	217	0	0	0	243	8	0	9	0	26	0	0	0	0	0	521
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	123	1692	0	6	0	2042	79	0	77	0	261	0	0	0	0	0	4280
APPROACH %'s :	6.75%	92.92%	0.00%	0.33%	0.00%	96.28%	3.72%	0.00%	22.78%	0.00%	77.22%	0.00%					
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	68	935	0	2	0	1149	33	0	29	0	130	0	0	0	0	0	2346
PEAK HR FACTOR :	0.89	0.866	0.000	0.500	0.000	0.873	0.917	0.000	0.604	0.000	0.793	0.000	0.000	0.000	0.000	0.000	0.898
	0.885				0.874				0.828								

National Data & Surveying Services **Intersection Turning Movement Count**

Location: S Riverside Ave & S Jurupa Ave
City: Bloomington
Control: Signalized

Project ID: 18-06047-007
Date: 4/12/2018

2axle

NS/EW Streets:	S Riverside Ave				S Riverside Ave				S Jurupa Ave				S Jurupa Ave				
	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
AM	1	2	0	0	0	2	0	0	1	0	1	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	10	0	0	0	6	0	0	0	0	3	0	0	0	0	0	19
7:15 AM	1	7	0	0	0	4	0	0	1	0	1	0	0	0	0	0	14
7:30 AM	2	8	0	2	0	7	0	0	0	0	2	0	0	0	0	0	21
7:45 AM	0	10	0	0	0	7	0	0	1	0	2	0	0	0	0	0	20
8:00 AM	1	5	0	0	0	6	1	0	0	0	0	0	0	0	0	0	13
8:15 AM	1	6	0	0	0	8	1	0	0	0	1	0	0	0	0	0	17
8:30 AM	1	7	0	0	0	8	0	0	0	0	6	0	0	0	0	0	22
8:45 AM	1	11	0	0	0	6	0	0	3	0	6	0	0	0	0	0	27
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	7	64	0	2	0	52	2	0	5	0	21	0	0	0	0	0	153
APPROACH %'s :	9.59%	87.67%	0.00%	2.74%	0.00%	96.30%	3.70%	0.00%	19.23%	0.00%	80.77%	0.00%					
PEAK HR :	07:15 AM - 08:15 AM																TOTAL
PEAK HR VOL :	4	30	0	2	0	24	1	0	2	0	5	0	0	0	0	0	68
PEAK HR FACTOR :	0.500	0.750	0.000	0.250	0.000	0.857	0.250	0.000	0.500	0.000	0.625	0.000	0.000	0.000	0.000	0.000	0.810
	0.750				0.893				0.583								

	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
PM	1	2	0	0	0	2	0	0	1	0	1	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	3	0	0	0	7	0	0	1	0	0	0	0	0	0	0	11
4:15 PM	1	4	0	0	0	7	1	0	0	0	2	0	0	0	0	0	15
4:30 PM	1	4	0	0	0	4	1	0	0	0	2	0	0	0	0	0	12
4:45 PM	3	5	0	0	0	3	3	0	0	0	1	0	0	0	0	0	15
5:00 PM	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
5:15 PM	1	5	0	0	0	3	3	0	0	0	0	0	0	0	0	0	12
5:30 PM	0	3	0	0	0	5	0	0	0	0	0	0	0	0	0	0	8
5:45 PM	0	3	0	0	0	4	1	0	0	0	0	0	0	0	0	0	8
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	6	29	0	0	0	33	9	0	1	0	5	0	0	0	0	0	83
APPROACH %'s :	17.14%	82.86%	0.00%	0.00%	0.00%	78.57%	21.43%	0.00%	16.67%	0.00%	83.33%	0.00%					
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	1	13	0	0	0	12	4	0	0	0	0	0	0	0	0	0	30
PEAK HR FACTOR :	0.25	0.650	0.000	0.000	0.000	0.600	0.333	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.625
	0.583				0.667												

National Data & Surveying Services **Intersection Turning Movement Count**

Location: S Riverside Ave & S Jurupa Ave
City: Bloomington
Control: Signalized

Project ID: 18-06047-007
Date: 4/12/2018

3axle

NS/EW Streets:	S Riverside Ave				S Riverside Ave				S Jurupa Ave				S Jurupa Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	0	2	0	0	1	0	1	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	5	0	0	0	4	0	0	1	0	1	0	0	0	0	0	11
7:15 AM	0	5	0	0	0	5	0	0	0	0	0	0	0	0	0	0	10
7:30 AM	1	6	0	0	0	5	0	0	0	0	1	0	0	0	0	0	13
7:45 AM	0	6	0	0	0	5	0	0	0	0	1	0	0	0	0	0	12
8:00 AM	1	8	0	0	0	7	0	0	2	0	1	0	0	0	0	0	19
8:15 AM	0	2	0	0	0	11	0	0	0	0	2	0	0	0	0	0	15
8:30 AM	1	8	0	0	0	6	0	0	0	0	2	0	0	0	0	0	17
8:45 AM	0	9	0	0	0	7	0	0	1	0	1	0	0	0	0	0	18
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	3	49	0	0	0	50	0	0	4	0	9	0	0	0	0	0	115
APPROACH %'s :	5.77%	94.23%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	30.77%	0.00%	69.23%	0.00%					
PEAK HR :	07:15 AM - 08:15 AM																TOTAL
PEAK HR VOL :	2	25	0	0	0	22	0	0	2	0	3	0	0	0	0	0	54
PEAK HR FACTOR :	0.500	0.781	0.000	0.000	0.000	0.786	0.000	0.000	0.250	0.000	0.750	0.000	0.000	0.000	0.000	0.000	0.711
	0.750				0.786				0.417								

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	0	2	0	0	1	0	1	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	4	0	0	0	6	0	0	0	0	3	0	0	0	0	0	13
4:15 PM	0	10	0	0	0	13	0	0	0	0	1	0	0	0	0	0	24
4:30 PM	0	4	0	0	0	7	0	0	0	0	0	0	0	0	0	0	11
4:45 PM	0	10	0	0	0	4	0	0	0	0	0	0	0	0	0	0	14
5:00 PM	1	4	0	0	0	10	0	0	0	0	1	0	0	0	0	0	16
5:15 PM	0	4	0	0	0	13	0	0	0	0	1	0	0	0	0	0	18
5:30 PM	1	6	0	0	0	10	0	0	0	0	0	0	0	0	0	0	17
5:45 PM	1	3	0	0	0	9	0	0	0	0	0	0	0	0	0	0	13
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	3	45	0	0	0	72	0	0	0	0	6	0	0	0	0	0	126
APPROACH %'s :	6.25%	93.75%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%	0.00%	100.00%	0.00%					
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	3	17	0	0	0	42	0	0	0	0	2	0	0	0	0	0	64
PEAK HR FACTOR :	0.75	0.708	0.000	0.000	0.000	0.808	0.000	0.000	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.889
	0.714				0.808				0.500								

National Data & Surveying Services **Intersection Turning Movement Count**

Location: S Riverside Ave & S Jurupa Ave
City: Bloomington
Control: Signalized

Project ID: 18-06047-007
Date: 4/12/2018

4axle

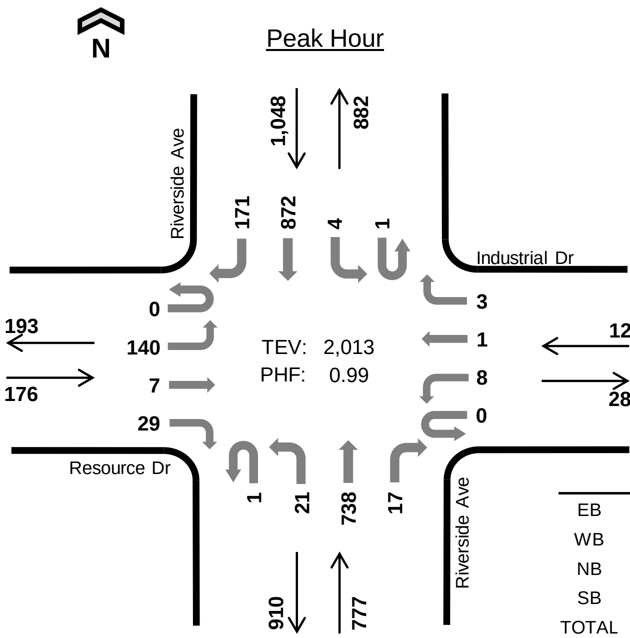
NS/EW Streets:	S Riverside Ave				S Riverside Ave				S Jurupa Ave				S Jurupa Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	0	2	0	0	1	0	1	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	22	0	0	0	21	0	0	0	0	1	0	0	0	0	0	44
7:15 AM	1	22	0	0	0	20	0	0	0	0	2	0	0	0	0	0	45
7:30 AM	1	15	0	0	0	17	1	0	0	0	1	0	0	0	0	0	35
7:45 AM	2	29	0	0	0	19	0	0	1	0	1	0	0	0	0	0	52
8:00 AM	1	23	0	0	0	16	1	0	0	0	5	0	0	0	0	0	46
8:15 AM	1	33	0	0	0	28	0	0	1	0	0	0	0	0	0	0	63
8:30 AM	0	37	0	0	0	30	0	0	2	0	6	0	0	0	0	0	75
8:45 AM	0	25	0	0	0	30	1	0	0	0	2	0	0	0	0	0	58
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	6	206	0	0	0	181	3	0	4	0	18	0	0	0	0	0	418
APPROACH %'s :	2.83%	97.17%	0.00%	0.00%	0.00%	98.37%	1.63%	0.00%	18.18%	0.00%	81.82%	0.00%					
PEAK HR :	07:15 AM - 08:15 AM																TOTAL
PEAK HR VOL :	5	89	0	0	0	72	2	0	1	0	9	0	0	0	0	0	178
PEAK HR FACTOR :	0.625	0.767	0.000	0.000	0.000	0.900	0.500	0.000	0.250	0.000	0.450	0.000	0.000	0.000	0.000	0.000	0.856
	0.758				0.925				0.500								

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	0	2	0	0	1	0	1	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	3	17	0	0	0	24	0	0	0	0	2	0	0	0	0	0	46
4:15 PM	4	15	0	0	0	21	1	0	0	0	2	0	0	0	0	0	43
4:30 PM	3	12	0	0	0	21	0	0	0	0	2	0	0	0	0	0	38
4:45 PM	1	14	0	0	0	20	0	0	1	0	0	0	0	0	0	0	36
5:00 PM	3	14	0	0	0	21	0	0	0	0	2	0	0	0	0	0	40
5:15 PM	0	12	0	0	0	19	1	0	0	0	3	0	0	0	0	0	35
5:30 PM	2	13	0	0	0	21	0	0	0	0	0	0	0	0	0	0	36
5:45 PM	1	19	0	0	0	26	1	0	0	0	0	0	0	0	0	0	47
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	17	116	0	0	0	173	3	0	1	0	11	0	0	0	0	0	321
APPROACH %'s :	12.78%	87.22%	0.00%	0.00%	0.00%	98.30%	1.70%	0.00%	8.33%	0.00%	91.67%	0.00%					
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	6	58	0	0	0	87	2	0	0	0	5	0	0	0	0	0	158
PEAK HR FACTOR :	0.50	0.763	0.000	0.000	0.000	0.837	0.500	0.000	0.000	0.000	0.417	0.000	0.000	0.000	0.000	0.000	0.840
	0.800				0.824				0.417								

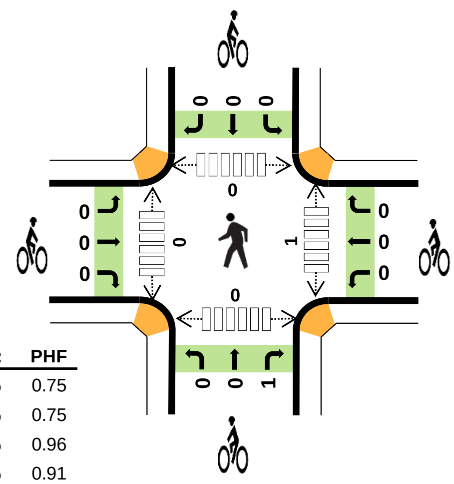
Riverside Ave
Resource Dr

Date: 05/15/2018
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:15 AM to 8:15 AM

Peak Hour



	HV %:	PHF
EB	27.8%	0.75
WB	58.3%	0.75
NB	17.6%	0.96
SB	17.9%	0.91
TOTAL	18.9%	0.99



Two-Hour Count Summaries

Interval Start	Resource Dr				Industrial Dr				Riverside Ave				Riverside Ave				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	19	0	5	0	1	0	0	0	2	159	2	0	1	239	30	458	0
7:15 AM	**0**	**20**	**0**	**5**	**0**	**3**	**1**	**0**	**0**	**6**	**169**	**9**	**1**	**0**	**236**	**52**	**502**	0
7:30 AM	**0**	**40**	**3**	**7**	**0**	**1**	**0**	**1**	**0**	**5**	**181**	**2**	**0**	**2**	**232**	**34**	**508**	0
7:45 AM	**0**	**35**	**2**	**5**	**0**	**2**	**0**	**2**	**0**	**5**	**195**	**3**	**0**	**1**	**203**	**40**	**493**	1,961
8:00 AM	**0**	**45**	**2**	**12**	**0**	**2**	**0**	**0**	**1**	**5**	**193**	**3**	**0**	**1**	**201**	**45**	**510**	**2,013**
8:15 AM	0	42	0	8	0	1	0	1	0	6	159	6	0	0	174	35	432	1,943
8:30 AM	0	49	1	11	0	1	0	2	0	5	169	3	1	2	184	35	463	1,898
8:45 AM	0	29	0	20	0	10	0	3	0	7	154	2	0	2	162	30	419	1,824
Count Total	0	279	8	73	0	21	1	9	1	41	1,379	30	2	9	1,631	301	3,785	0
Peak Hour All	**0**	**140**	**7**	**29**	**0**	**8**	**1**	**3**	**1**	**21**	**738**	**17**	**1**	**4**	**872**	**171**	**2,013**	**0**
Peak Hour HV	**0**	**45**	**3**	**1**	**0**	**5**	**1**	**1**	**0**	**9**	**124**	**4**	**0**	**3**	**143**	**42**	**381**	**0**
Peak Hour HV%	**-**	**32%**	**43%**	**3%**	**-**	**63%**	**100%**	**33%**	**0%**	**43%**	**17%**	**24%**	**0%**	**75%**	**16%**	**25%**	**19%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	13	1	34	46	*94*	0	0	0	0	*0*	0	0	0	0	*0*
7:15 AM	**12**	**2**	**41**	**53**	***108***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
7:30 AM	**13**	**1**	**25**	**46**	***85***	**0**	**0**	**1**	**0**	***1***	**1**	**0**	**0**	**0**	*1*
7:45 AM	**15**	**2**	**34**	**45**	***96***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
8:00 AM	**9**	**2**	**37**	**44**	***92***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
8:15 AM	9	2	51	42	*104*	0	0	0	0	*0*	2	0	0	1	*3*
8:30 AM	12	1	36	63	*112*	0	0	0	0	*0*	0	0	0	0	*0*
8:45 AM	24	9	43	61	*137*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	107	20	301	400	*828*	0	0	1	0	*1*	3	0	0	1	*4*
Peak Hour	**49**	**7**	**137**	**188**	***381***	**0**	**0**	**1**	**0**	***1***	**1**	**0**	**0**	**0**	***1***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Resource Dr Eastbound UT	LT	TH	RT	Industrial Dr Westbound UT	LT	TH	RT	Riverside Ave Northbound UT	LT	TH	RT	Riverside Ave Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
7:00 AM	0	11	0	2	0	1	0	0	0	1	33	0	0	0	33	13	94	0
7:15 AM	**0**	**12**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**6**	**32**	**3**	**0**	**0**	**40**	**13**	**108**	0
7:30 AM	**0**	**11**	**1**	**1**	**0**	**1**	**0**	**0**	**0**	**1**	**24**	**0**	**0**	**2**	**32**	**12**	**85**	0
7:45 AM	**0**	**15**	**0**	**0**	**0**	**1**	**0**	**1**	**0**	**1**	**32**	**1**	**0**	**0**	**34**	**11**	**96**	383
8:00 AM	**0**	**7**	**2**	**0**	**0**	**2**	**0**	**0**	**0**	**1**	**36**	**0**	**0**	**1**	**37**	**6**	**92**	**381**
8:15 AM	0	9	0	0	0	1	0	1	0	2	48	1	0	0	30	12	104	377
8:30 AM	0	10	0	2	0	0	0	1	0	1	33	2	1	1	41	20	112	404
8:45 AM	0	13	0	11	0	9	0	0	0	2	39	2	0	2	47	12	137	445
Count Total	0	88	3	16	0	16	1	3	0	15	277	9	1	6	294	99	828	0
Peak Hour	**0**	**45**	**3**	**1**	**0**	**5**	**1**	**1**	**0**	**9**	**124**	**4**	**0**	**3**	**143**	**42**	**381**	**0**

Two-Hour Count Summaries - Bikes

Interval Start	Resource Dr Eastbound LT	TH	RT	Industrial Dr Westbound LT	TH	RT	Riverside Ave Northbound LT	TH	RT	Riverside Ave Southbound LT	TH	RT	15-min Total	Rolling One Hour
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
7:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	0
7:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	1
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	0	0	0	0	0	0	1	0	0	0	1	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**

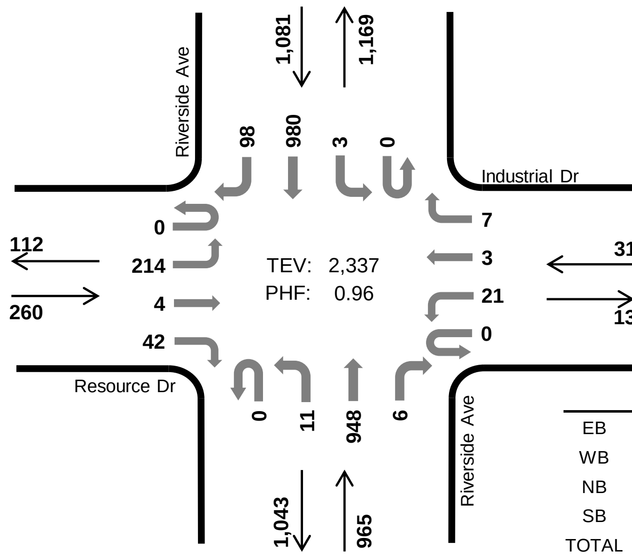
Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Riverside Ave
Resource Dr

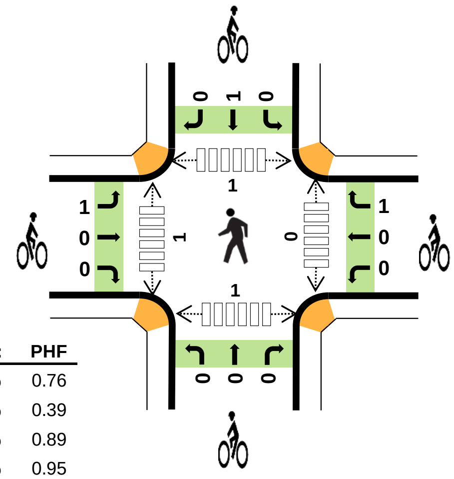
Date: 05/15/2018
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:30 PM to 5:30 PM

N

Peak Hour



	HV %:	PHF
EB	12.7%	0.76
WB	22.6%	0.39
NB	11.2%	0.89
SB	15.5%	0.95
TOTAL	13.5%	0.96



Two-Hour Count Summaries

Interval Start	Resource Dr Eastbound UT	LT	TH	RT	Industrial Dr Westbound UT	LT	TH	RT	Riverside Ave Northbound UT	LT	TH	RT	Riverside Ave Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
4:00 PM	0	57	0	9	0	7	0	2	0	0	230	4	0	2	259	24	594	0
4:15 PM	0	26	0	7	0	5	0	1	0	2	242	4	0	1	246	19	553	0
4:30 PM	**0**	**46**	**1**	**8**	**0**	**17**	**1**	**2**	**0**	**1**	**213**	**3**	**0**	**0**	**231**	**21**	**544**	0
4:45 PM	**0**	**46**	**1**	**9**	**0**	**2**	**1**	**4**	**0**	**4**	**223**	**1**	**0**	**1**	**263**	**19**	**574**	2,265
5:00 PM	**0**	**51**	**0**	**12**	**0**	**2**	**1**	**0**	**0**	**1**	**268**	**1**	**0**	**1**	**246**	**27**	**610**	2,281
5:15 PM	**0**	**71**	**2**	**13**	**0**	**0**	**0**	**1**	**0**	**5**	**244**	**1**	**0**	**1**	**240**	**31**	**609**	**2,337**
5:30 PM	0	43	1	7	0	1	0	1	0	7	217	1	1	0	211	51	541	2,334
5:45 PM	0	33	4	23	0	3	0	1	0	10	121	14	0	8	244	66	527	2,287
Count Total	0	373	9	88	0	37	3	12	0	30	1,758	29	1	14	1,940	258	4,552	0
Peak Hour All	**0**	**214**	**4**	**42**	**0**	**21**	**3**	**7**	**0**	**11**	**948**	**6**	**0**	**3**	**980**	**98**	**2,337**	**0**
Peak Hour HV	**0**	**22**	**3**	**8**	**0**	**2**	**1**	**4**	**0**	**3**	**102**	**3**	**0**	**2**	**127**	**39**	**316**	**0**
Peak Hour HV%	**-**	**10%**	**75%**	**19%**	**-**	**10%**	**33%**	**57%**	**-**	**27%**	**11%**	**50%**	**-**	**67%**	**13%**	**40%**	**14%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
4:00 PM	12	2	22	54	*90*	0	0	0	0	*0*	0	1	0	0	*1*
4:15 PM	8	1	32	53	*94*	0	0	0	0	*0*	0	0	0	0	*0*
4:30 PM	**11**	**3**	**26**	**52**	***92***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
4:45 PM	**12**	**4**	**26**	**37**	***79***	**0**	**0**	**0**	**1**	***1***	**0**	**0**	**0**	**0**	*0*
5:00 PM	**4**	**0**	**28**	**42**	***74***	**0**	**1**	**0**	**0**	***1***	**0**	**1**	**1**	**0**	*2*
5:15 PM	**6**	**0**	**28**	**37**	***71***	**1**	**0**	**0**	**0**	***1***	**0**	**0**	**0**	**1**	***1***
5:30 PM	6	1	25	36	*68*	0	0	0	0	*0*	0	0	0	0	*0*
5:45 PM	19	1	19	47	*86*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	78	12	206	358	*654*	1	1	0	1	*3*	0	2	1	1	*4*
Peak Hour	**33**	**7**	**108**	**168**	***316***	**1**	**1**	**0**	**1**	***3***	**0**	**1**	**1**	**1**	***3***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Resource Dr				Industrial Dr				Riverside Ave				Riverside Ave				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	10	0	2	0	1	0	1	0	0	19	3	0	2	38	14	90	0
4:15 PM	0	4	0	4	0	0	0	1	0	2	29	1	0	1	39	13	94	0
4:30 PM	**0**	**7**	**1**	**3**	**0**	**2**	**0**	**1**	**0**	**0**	**24**	**2**	**0**	**0**	**39**	**13**	**92**	0
4:45 PM	**0**	**9**	**1**	**2**	**0**	**0**	**1**	**3**	**0**	**2**	**23**	**1**	**0**	**0**	**31**	**6**	**79**	355
5:00 PM	**0**	**2**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**28**	**0**	**0**	**1**	**28**	**13**	**74**	339
5:15 PM	**0**	**4**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**27**	**0**	**0**	**1**	**29**	**7**	**71**	**316**
5:30 PM	0	5	1	0	0	0	0	1	0	0	24	1	0	0	33	3	68	292
5:45 PM	0	9	4	6	0	0	0	1	0	1	16	2	0	4	31	12	86	299
Count Total	0	50	8	20	0	3	1	8	0	6	190	10	0	9	268	81	654	0
Peak Hour	**0**	**22**	**3**	**8**	**0**	**2**	**1**	**4**	**0**	**3**	**102**	**3**	**0**	**2**	**127**	**39**	**316**	**0**

Two-Hour Count Summaries - Bikes

Interval Start	Resource Dr			Industrial Dr			Riverside Ave			Riverside Ave			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
4:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	1
5:00 PM	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	2
5:15 PM	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**3**
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	3
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Count Total	1	0	0	0	0	1	0	0	0	0	1	0	3	0
Peak Hour	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**3**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

National Data & Surveying Services

Intersection Turning Movement Count

Location: Riverside Ave & Agua Mansa Rd
City: Colton
Control: Signalized

Project ID: Historical
Date: 3/7/2019

Total

NS/EW Streets:	Riverside Ave				Riverside Ave				Agua Mansa Rd				Agua Mansa Rd				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	1	2	1	0	1	1	1	0	1	1	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	25	142	9	1	5	165	22	0	28	20	9	0	13	47	16	0	502
7:15 AM	22	148	3	2	6	209	26	0	22	20	14	0	23	65	13	0	573
7:30 AM	22	150	7	2	11	223	26	0	28	23	15	0	12	68	11	0	598
7:45 AM	26	135	3	2	13	195	23	0	26	20	19	0	34	63	5	0	564
8:00 AM	22	139	11	1	12	166	22	0	22	18	16	0	21	43	12	0	505
8:15 AM	30	154	8	1	13	132	19	0	26	23	17	0	11	26	11	0	471
8:30 AM	15	127	10	1	6	152	30	0	34	18	17	0	9	31	12	0	462
8:45 AM	19	117	4	2	11	150	21	0	21	19	10	0	6	27	7	0	414
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	181	1112	55	12	77	1392	189	0	207	161	117	0	129	370	87	0	4089
APPROACH %'s :	13.31%	81.76%	4.04%	0.88%	4.64%	83.96%	11.40%	0.00%	42.68%	33.20%	24.12%	0.00%	22.01%	63.14%	14.85%	0.00%	
PEAK HR :	07:15 AM - 08:15 AM																TOTAL
PEAK HR VOL :	92	572	24	7	42	793	97	0	98	81	64	0	90	239	41	0	2240
PEAK HR FACTOR :	0.885	0.953	0.545	0.875	0.808	0.889	0.933	0.000	0.875	0.880	0.842	0.000	0.662	0.879	0.788	0.000	0.936
	0.960				0.896				0.920				0.907				

	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
PM	1	2	0	0	1	2	1	0	1	1	1	0	1	1	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	26	165	11	6	14	180	17	0	37	94	45	0	18	40	12	0	665
4:15 PM	27	174	22	3	24	223	24	0	21	103	32	0	9	31	18	0	711
4:30 PM	23	174	14	0	17	204	32	0	35	97	36	0	11	46	14	0	703
4:45 PM	31	183	24	3	17	221	32	0	25	72	26	1	6	40	13	0	694
5:00 PM	26	167	18	4	20	230	34	0	28	109	45	0	16	32	13	0	742
5:15 PM	32	178	23	4	17	236	21	0	24	93	38	0	18	43	8	0	735
5:30 PM	19	148	9	0	20	215	22	0	25	102	40	1	14	35	22	0	672
5:45 PM	19	152	18	4	19	212	16	0	29	79	33	0	17	31	11	0	640
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	203	1341	139	24	148	1721	198	0	224	749	295	2	109	298	111	0	5562
APPROACH %'s :	11.89%	78.56%	8.14%	1.41%	7.16%	83.26%	9.58%	0.00%	17.64%	58.98%	23.23%	0.16%	21.04%	57.53%	21.43%	0.00%	
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	112	702	79	11	71	891	119	0	112	371	145	1	51	161	48	0	2874
PEAK HR FACTOR :	0.875	0.959	0.823	0.688	0.888	0.944	0.875	0.000	0.800	0.851	0.806	0.250	0.708	0.875	0.857	0.000	0.968
	0.938				0.952				0.864				0.915				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Riverside Ave & Agua Mansa Rd
City: Colton
Control: Signalized

Project ID: Historical
Date: 3/7/2019

Cars

NS/EW Streets:	Riverside Ave				Riverside Ave				Agua Mansa Rd				Agua Mansa Rd				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	1	2	1	0	1	1	1	0	1	1	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	21	123	4	1	4	150	17	0	24	17	6	0	10	42	3	0	422
7:15 AM	19	132	0	2	3	192	19	0	16	20	11	0	19	58	11	0	502
7:30 AM	19	136	4	2	8	213	18	0	20	20	11	0	9	63	6	0	529
7:45 AM	17	123	0	2	8	176	12	0	21	16	14	0	31	59	2	0	481
8:00 AM	12	120	8	1	7	142	16	0	18	15	14	0	17	37	9	0	416
8:15 AM	22	136	8	1	8	102	13	0	19	18	12	0	11	23	7	0	380
8:30 AM	12	109	8	1	3	119	21	0	20	14	9	0	6	22	5	0	349
8:45 AM	9	97	4	2	6	110	15	0	14	18	5	0	5	21	6	0	312
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	131	976	36	12	47	1204	131	0	152	138	82	0	108	325	49	0	3391
APPROACH %'s :	11.34%	84.50%	3.12%	1.04%	3.40%	87.12%	9.48%	0.00%	40.86%	37.10%	22.04%	0.00%	22.41%	67.43%	10.17%	0.00%	
PEAK HR :	07:15 AM - 08:15 AM																TOTAL
PEAK HR VOL :	67	511	12	7	26	723	65	0	75	71	50	0	76	217	28	0	1928
PEAK HR FACTOR :	0.88	0.939	0.375	0.875	0.813	0.849	0.855	0.000	0.893	0.888	0.893	0.000	0.613	0.861	0.636	0.000	0.911
	0.927				0.851				0.961				0.872				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	1	2	1	0	1	1	1	0	1	1	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	18	157	9	6	10	163	10	0	29	92	37	0	16	37	9	0	593
4:15 PM	20	157	20	3	18	203	15	0	15	98	28	0	7	26	12	0	622
4:30 PM	18	157	9	0	15	193	25	0	31	95	33	0	8	39	11	0	634
4:45 PM	21	168	18	3	13	207	22	0	18	69	23	1	4	36	10	0	613
5:00 PM	22	156	17	4	17	217	24	0	23	104	43	0	16	27	7	0	677
5:15 PM	30	166	20	4	15	222	17	0	16	92	34	0	17	36	3	0	672
5:30 PM	16	135	8	0	17	204	12	0	19	96	36	1	13	33	11	0	601
5:45 PM	11	142	15	4	15	200	12	0	21	76	28	0	14	27	5	0	570
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	156	1238	116	24	120	1609	137	0	172	722	262	2	95	261	68	0	4982
APPROACH %'s :	10.17%	80.70%	7.56%	1.56%	6.43%	86.23%	7.34%	0.00%	14.85%	62.35%	22.63%	0.17%	22.41%	61.56%	16.04%	0.00%	
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	91	647	64	11	60	839	88	0	88	360	133	1	45	138	31	0	2596
PEAK HR FACTOR :	0.76	0.963	0.800	0.688	0.882	0.945	0.880	0.000	0.710	0.865	0.773	0.250	0.662	0.885	0.705	0.000	0.959
	0.924				0.956				0.856				0.922				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Riverside Ave & Agua Mansa Rd
City: Colton
Control: Signalized

Project ID: Historical
Date: 3/7/2019

2axle

NS/EW Streets:	Riverside Ave				Riverside Ave				Agua Mansa Rd				Agua Mansa Rd				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	1	2	1	0	1	1	1	0	1	1	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	2	11	4	0	0	3	2	0	0	3	1	0	1	0	2	0	29
7:15 AM	2	6	1	0	1	7	1	0	3	0	1	0	1	2	0	0	25
7:30 AM	1	7	1	0	1	1	1	0	1	2	1	0	2	2	1	0	21
7:45 AM	5	6	2	0	2	6	2	0	2	0	3	0	1	1	1	0	31
8:00 AM	4	3	1	0	0	4	1	0	0	1	1	0	2	2	1	0	20
8:15 AM	6	4	0	0	1	11	1	0	1	1	3	0	0	0	0	0	28
8:30 AM	1	7	0	0	0	18	1	0	1	1	2	0	0	3	1	0	35
8:45 AM	2	5	0	0	1	24	0	0	1	0	1	0	0	1	0	0	35
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	23	49	9	0	6	74	9	0	9	8	13	0	7	11	6	0	224
APPROACH %'s :	28.40%	60.49%	11.11%	0.00%	6.74%	83.15%	10.11%	0.00%	30.00%	26.67%	43.33%	0.00%	29.17%	45.83%	25.00%	0.00%	
PEAK HR :	07:15 AM - 08:15 AM																TOTAL
PEAK HR VOL :	12	22	5	0	4	18	5	0	6	3	6	0	6	7	3	0	97
PEAK HR FACTOR :	0.600	0.786	0.625	0.000	0.500	0.643	0.625	0.000	0.500	0.375	0.500	0.000	0.750	0.875	0.750	0.000	0.782
	0.750				0.675				0.750				0.800				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	1	2	1	0	1	1	1	0	1	1	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	5	5	2	0	0	4	2	0	1	1	4	0	2	1	1	0	28
4:15 PM	4	10	1	0	1	5	4	0	0	5	1	0	2	2	1	0	36
4:30 PM	3	6	3	0	0	3	1	0	1	1	3	0	2	2	0	0	25
4:45 PM	7	4	2	0	1	3	3	0	0	2	2	0	2	1	0	0	27
5:00 PM	3	3	0	0	0	6	1	0	2	4	1	0	0	3	0	0	23
5:15 PM	1	3	1	0	0	1	1	0	0	0	2	0	1	1	0	0	11
5:30 PM	1	3	0	0	0	3	0	0	1	3	3	0	0	2	0	0	16
5:45 PM	4	1	0	0	0	2	0	0	0	1	0	0	0	1	0	0	9
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	28	35	9	0	2	27	12	0	5	17	16	0	9	13	2	0	175
APPROACH %'s :	38.89%	48.61%	12.50%	0.00%	4.88%	65.85%	29.27%	0.00%	13.16%	44.74%	42.11%	0.00%	37.50%	54.17%	8.33%	0.00%	
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	14	16	6	0	1	13	6	0	3	7	8	0	5	7	0	0	86
PEAK HR FACTOR :	0.50	0.667	0.500	0.000	0.250	0.542	0.500	0.000	0.375	0.438	0.667	0.000	0.625	0.583	0.000	0.000	0.796
	0.692				0.714				0.643				0.750				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Riverside Ave & Agua Mansa Rd
City: Colton
Control: Signalized

Project ID: Historical
Date: 3/7/2019

3axle

NS/EW Streets:	Riverside Ave				Riverside Ave				Agua Mansa Rd				Agua Mansa Rd				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	1	2	1	0	1	1	1	0	1	1	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	2	0	0	1	1	1	0	1	0	1	0	2	1	3	0	13
7:15 AM	1	0	1	0	1	3	2	0	0	0	1	0	3	3	1	0	16
7:30 AM	0	3	1	0	0	2	0	0	4	1	1	0	0	0	3	0	15
7:45 AM	0	2	1	0	1	4	2	0	0	2	1	0	2	0	0	0	15
8:00 AM	1	5	0	0	1	6	2	0	1	0	0	0	2	1	0	0	19
8:15 AM	1	3	0	0	1	8	1	0	2	0	2	0	0	1	2	0	21
8:30 AM	0	2	0	0	1	5	2	0	4	0	1	0	1	1	2	0	19
8:45 AM	2	2	0	0	1	1	3	0	2	0	3	0	0	2	0	0	16
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	5	19	3	0	7	30	13	0	14	3	10	0	10	9	11	0	134
APPROACH %'s :	18.52%	70.37%	11.11%	0.00%	14.00%	60.00%	26.00%	0.00%	51.85%	11.11%	37.04%	0.00%	33.33%	30.00%	36.67%	0.00%	
PEAK HR :	07:15 AM - 08:15 AM																TOTAL
PEAK HR VOL :	2	10	3	0	3	15	6	0	5	3	3	0	7	4	4	0	65
PEAK HR FACTOR :	0.500	0.500	0.750	0.000	0.750	0.625	0.750	0.000	0.313	0.375	0.750	0.000	0.583	0.333	0.333	0.000	0.855
	0.625				0.667				0.458				0.536				

	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
PM	1	2	0	0	1	2	1	0	1	1	1	0	1	1	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	1	0	0	1	6	0	0	2	0	2	0	0	1	0	0	13
4:15 PM	2	0	0	0	2	6	0	0	0	0	1	0	0	0	0	0	11
4:30 PM	1	1	0	0	0	3	1	0	0	0	0	0	0	1	0	0	7
4:45 PM	2	1	1	0	0	3	2	0	0	0	0	0	0	1	1	0	11
5:00 PM	0	1	1	0	1	3	6	0	0	0	0	0	0	1	0	0	13
5:15 PM	1	3	2	0	0	6	0	0	0	1	1	0	0	1	0	0	15
5:30 PM	1	4	1	0	0	6	4	0	1	0	0	0	1	0	2	0	20
5:45 PM	2	3	2	0	0	3	1	0	0	1	2	0	1	0	3	0	18
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	9	14	7	0	4	36	14	0	3	2	6	0	2	5	6	0	108
APPROACH %'s :	30.00%	46.67%	23.33%	0.00%	7.41%	66.67%	25.93%	0.00%	27.27%	18.18%	54.55%	0.00%	15.38%	38.46%	46.15%	0.00%	
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	4	6	4	0	1	15	9	0	0	1	1	0	0	4	1	0	46
PEAK HR FACTOR :	0.50	0.500	0.500	0.000	0.250	0.625	0.375	0.000	0.000	0.250	0.250	0.000	0.000	1.000	0.250	0.000	0.767
	0.583				0.625				0.250				0.625				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Riverside Ave & Agua Mansa Rd
City: Colton
Control: Signalized

Project ID: Historical
Date: 3/7/2019

4axle

NS/EW Streets:	Riverside Ave				Riverside Ave				Agua Mansa Rd				Agua Mansa Rd				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	1	2	1	0	1	1	1	0	1	1	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	2	6	1	0	0	11	2	0	3	0	1	0	0	4	8	0	38
7:15 AM	0	10	1	0	1	7	4	0	3	0	1	0	0	2	1	0	30
7:30 AM	2	4	1	0	2	7	7	0	3	0	2	0	1	3	1	0	33
7:45 AM	4	4	0	0	2	9	7	0	3	2	1	0	0	3	2	0	37
8:00 AM	5	11	2	0	4	14	3	0	3	2	1	0	0	3	2	0	50
8:15 AM	1	11	0	0	3	11	4	0	4	4	0	0	0	2	2	0	42
8:30 AM	2	9	2	0	2	10	6	0	9	3	5	0	2	5	4	0	59
8:45 AM	6	13	0	0	3	15	3	0	4	1	1	0	1	3	1	0	51
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	22	68	7	0	17	84	36	0	32	12	12	0	4	25	21	0	340
APPROACH %'s :	22.68%	70.10%	7.22%	0.00%	12.41%	61.31%	26.28%	0.00%	57.14%	21.43%	21.43%	0.00%	8.00%	50.00%	42.00%	0.00%	
PEAK HR :	07:15 AM - 08:15 AM																TOTAL
PEAK HR VOL :	11	29	4	0	9	37	21	0	12	4	5	0	1	11	6	0	150
PEAK HR FACTOR :	0.550	0.659	0.500	0.000	0.563	0.661	0.750	0.000	1.000	0.500	0.625	0.000	0.250	0.917	0.750	0.000	0.750
	0.611				0.798				0.875				0.900				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	1	2	1	0	1	1	1	0	1	1	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	3	2	0	0	3	7	5	0	5	1	2	0	0	1	2	0	31
4:15 PM	1	7	1	0	3	9	5	0	6	0	2	0	0	3	5	0	42
4:30 PM	1	10	2	0	2	5	5	0	3	1	0	0	1	4	3	0	37
4:45 PM	1	10	3	0	3	8	5	0	7	1	1	0	0	2	2	0	43
5:00 PM	1	7	0	0	2	4	3	0	3	1	1	0	0	1	6	0	29
5:15 PM	0	6	0	0	2	7	3	0	8	0	1	0	0	5	5	0	37
5:30 PM	1	6	0	0	3	2	6	0	4	3	1	0	0	0	9	0	35
5:45 PM	2	6	1	0	4	7	3	0	8	1	3	0	2	3	3	0	43
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	10	54	7	0	22	49	35	0	44	8	11	0	3	19	35	0	297
APPROACH %'s :	14.08%	76.06%	9.86%	0.00%	20.75%	46.23%	33.02%	0.00%	69.84%	12.70%	17.46%	0.00%	5.26%	33.33%	61.40%	0.00%	
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	3	33	5	0	9	24	16	0	21	3	3	0	1	12	16	0	146
PEAK HR FACTOR :	0.75	0.825	0.417	0.000	0.750	0.750	0.800	0.000	0.656	0.750	0.750	0.000	0.250	0.600	0.667	0.000	0.849
	0.732				0.766				0.750				0.725				

A816

24-HOUR ROADWAY SEGMENT COUNTS (WITH CLASSIFICATION)

Prepared by AimTD LLC tel. 714 253 7888 cs@aimtd.com

DATE: Tuesday, June 05, 2018 CITY: Rialto

JOB #: SC LOCATION: South Riverside between I-10 EB Ramps and Slover

AM TIME	1	2	3	4	5	6	TOTAL	PM Time	1	2	3	4	5	6	TOTAL
0:00	74	1	0	17	0	0	92	12:00	184	25	12	55	0	0	276
0:15	78	1	3	22	0	0	104	12:15	173	22	17	57	0	1	270
0:30	55	1	3	30	0	0	89	12:30	187	30	9	57	0	0	283
0:45	57	1	1	32	0	0	91	12:45	167	21	15	46	0	1	250
1:00	53	4	4	29	0	0	90	13:00	172	14	12	44	1	1	244
1:15	39	2	1	22	0	0	64	13:15	188	20	20	37	0	1	266
1:30	54	0	1	26	0	0	81	13:30	184	14	14	46	0	0	258
1:45	41	0	1	22	0	0	64	13:45	212	28	14	52	0	1	307
2:00	36	0	1	20	0	0	57	14:00	261	28	14	41	0	1	345
2:15	42	1	0	37	0	0	80	14:15	221	26	12	39	0	1	299
2:30	43	1	2	11	0	0	57	14:30	296	29	13	26	0	0	364
2:45	28	2	1	27	0	0	58	14:45	334	19	16	24	0	2	395
3:00	36	0	0	19	0	0	55	15:00	306	27	13	35	0	1	382
3:15	41	1	2	36	0	0	80	15:15	300	23	10	34	0	1	368
3:30	45	3	1	23	0	0	72	15:30	323	17	9	29	0	0	378
3:45	66	3	0	16	0	0	85	15:45	379	16	12	24	0	1	432
4:00	67	4	3	34	0	0	108	16:00	330	17	13	24	0	0	384
4:15	72	3	7	34	0	0	116	16:15	349	23	5	36	0	0	413
4:30	58	5	4	50	0	0	117	16:30	364	20	6	34	0	0	424
4:45	66	7	7	32	0	0	112	16:45	372	21	5	18	0	0	416
5:00	52	2	3	30	0	0	87	17:00	423	21	8	26	0	0	478
5:15	71	6	10	33	0	0	120	17:15	363	21	4	29	1	0	418
5:30	63	7	6	32	0	0	108	17:30	334	25	6	35	0	2	402
5:45	88	14	11	41	0	0	154	17:45	358	9	5	23	0	0	395
6:00	99	11	12	42	0	0	164	18:00	342	14	4	24	0	0	384
6:15	102	23	13	42	0	0	180	18:15	324	12	4	24	0	1	365
6:30	125	13	7	36	0	0	181	18:30	307	14	5	42	0	0	368
6:45	120	19	15	32	0	0	186	18:45	321	12	7	38	0	0	378
7:00	131	17	15	47	0	0	210	19:00	173	14	8	29	0	0	224
7:15	128	19	16	25	0	0	188	19:15	166	9	1	19	0	0	195
7:30	150	19	12	36	0	0	217	19:30	125	8	3	16	0	0	152
7:45	161	19	16	36	0	0	232	19:45	121	5	3	22	0	0	151
8:00	122	23	15	42	0	1	203	20:00	128	10	1	19	0	0	158
8:15	146	28	11	61	0	1	247	20:15	118	7	8	28	0	0	161
8:30	180	28	33	51	0	0	292	20:30	106	12	6	27	1	0	152
8:45	164	37	25	52	0	0	278	20:45	101	4	6	26	0	0	137
9:00	149	49	20	51	0	1	270	21:00	91	6	5	28	0	0	130
9:15	148	44	6	69	0	1	268	21:15	80	4	6	23	0	0	113
9:30	174	40	15	48	1	2	280	21:30	83	4	2	30	0	0	119
9:45	139	23	13	58	1	0	234	21:45	91	4	6	19	0	0	120
10:00	140	39	14	52	0	0	245	22:00	119	4	4	25	0	0	152
10:15	127	31	18	42	0	0	218	22:15	119	0	2	28	0	0	149
10:30	149	30	13	53	0	1	246	22:30	128	4	2	19	0	0	153
10:45	165	28	13	46	0	1	253	22:45	115	1	3	28	0	1	148
11:00	163	25	17	48	1	1	255	23:00	99	2	7	20	0	0	128
11:15	167	37	8	55	0	1	268	23:15	77	2	5	19	0	0	103
11:30	157	27	5	56	0	0	245	23:30	63	1	2	19	0	0	85
11:45	148	21	20	51	1	1	242	23:45	49	6	1	22	0	0	78
TOTAL	4,779	719	424	1,806	4	11	7,743	TOTAL	10,226	675	365	1,465	3	16	12,750

AM PEAK HOUR	8:30 AM	AM PEAK HOUR	4:30 PM
AM PEAK VOLUME	1,108	AM PEAK VOLUME	1,736

CLASS 1 PASSENGER VEHICLES	TOTAL: AM+PM	15,005	1,394	789	3,271	7	27	20,493
CLASS 2 2-AXLE TRUCKS	% OF TOTAL	73.2%	6.8%	3.9%	16.0%	0.0%	0.1%	100.0%
CLASS 3 3-AXLE TRUCKS								
CLASS 4 4 OR MORE AXLE TRUCKS								
CLASS 5 RV	TOTAL: ALL	31,784	2,897	1,621	6,257	12	55	42,626
CLASS 6 Buses	% OF TOTAL	74.6%	6.8%	3.8%	14.7%	0.0%	0.1%	100.0%

24-HOUR ROADWAY SEGMENT COUNTS (WITH CLASSIFICATION)

Prepared by AimTD LLC tel. 714 253 7888 cs@aimtd.com

DATE: Tuesday, June 05, 2018
JOB #: SC
CITY: Rialto
LOCATION: South Riverside between I-10 EB Ramps and Slover

AM TIME	1	2	3	4	5	6	TOTAL	PM Time	1	2	3	4	5	6	TOTAL
0:00	37	0	6	29	0	0	72	12:00	147	24	15	41	0	0	227
0:15	51	3	4	31	0	0	89	12:15	204	31	14	44	0	0	293
0:30	33	1	4	47	0	0	85	12:30	236	16	16	47	0	3	318
0:45	34	1	1	28	0	0	64	12:45	215	27	21	40	0	1	304
1:00	27	1	4	22	0	0	54	13:00	202	22	12	42	0	1	279
1:15	27	0	1	26	0	0	54	13:15	198	20	19	44	0	0	281
1:30	39	0	2	24	0	0	65	13:30	242	25	11	44	0	0	322
1:45	54	1	3	18	0	0	76	13:45	231	20	9	38	0	0	298
2:00	45	2	4	21	0	0	72	14:00	196	30	15	34	0	1	276
2:15	46	0	2	28	0	0	76	14:15	216	30	19	39	0	1	305
2:30	55	3	4	20	0	0	82	14:30	219	26	14	39	0	0	298
2:45	77	1	2	28	0	0	108	14:45	242	28	14	39	0	1	324
3:00	58	7	4	33	0	0	102	15:00	239	30	11	44	0	1	325
3:15	86	3	1	27	0	0	117	15:15	218	34	17	26	0	0	295
3:30	149	8	1	27	0	0	185	15:30	268	29	15	40	0	1	353
3:45	157	3	3	21	0	0	184	15:45	236	32	12	26	0	0	306
4:00	131	7	4	18	0	0	160	16:00	207	25	13	38	0	0	283
4:15	147	4	4	18	0	0	173	16:15	247	24	14	12	0	0	297
4:30	184	7	2	27	0	0	220	16:30	301	30	14	31	1	0	377
4:45	236	8	6	27	0	0	277	16:45	259	29	9	22	1	0	320
5:00	189	11	1	24	0	0	225	17:00	213	18	6	24	0	0	261
5:15	274	11	5	18	0	0	308	17:15	257	17	6	21	1	0	302
5:30	413	18	0	22	0	0	453	17:30	263	19	7	23	0	0	312
5:45	391	20	5	25	0	0	441	17:45	284	23	5	32	0	0	344
6:00	287	14	9	27	1	0	338	18:00	252	17	8	36	0	0	313
6:15	312	23	5	31	0	1	372	18:15	251	27	5	32	0	0	315
6:30	350	23	6	34	0	0	413	18:30	238	18	11	31	0	1	299
6:45	391	25	14	31	0	0	461	18:45	205	15	14	39	0	0	273
7:00	298	35	16	36	0	4	389	19:00	128	8	5	31	0	0	172
7:15	316	21	13	25	0	0	375	19:15	119	12	3	39	0	0	173
7:30	392	21	10	25	0	0	448	19:30	111	4	4	26	0	0	145
7:45	334	16	9	34	0	0	393	19:45	117	4	7	38	0	0	166
8:00	266	32	19	38	0	1	356	20:00	103	8	4	21	0	0	136
8:15	215	19	17	29	0	0	280	20:15	112	8	5	24	0	0	149
8:30	162	13	19	33	0	0	227	20:30	112	4	9	37	0	0	162
8:45	156	19	10	28	0	2	215	20:45	118	4	6	33	0	0	161
9:00	133	23	5	29	0	2	192	21:00	105	1	8	20	0	0	134
9:15	148	31	23	37	0	0	239	21:15	106	2	4	21	0	0	133
9:30	156	17	16	42	1	1	233	21:30	115	4	3	23	0	0	145
9:45	163	25	11	35	0	0	234	21:45	121	4	8	24	0	0	157
10:00	152	34	7	39	0	0	232	22:00	81	2	6	28	0	0	117
10:15	148	31	14	44	0	0	237	22:15	108	4	5	21	0	0	138
10:30	166	36	11	47	0	0	260	22:30	136	3	4	27	0	1	171
10:45	176	28	17	42	0	0	263	22:45	105	1	4	29	0	0	139
11:00	143	34	14	47	0	0	238	23:00	66	1	4	36	0	0	107
11:15	137	26	17	50	0	1	231	23:15	52	0	8	20	0	0	80
11:30	159	42	17	43	0	3	264	23:30	58	0	3	32	0	0	93
11:45	170	34	13	29	0	1	247	23:45	50	1	1	24	0	0	76
TOTAL	8,270	742	385	1,464	2	16	10,879	TOTAL	8,509	761	447	1,522	3	12	11,254

AM PEAK HOUR	6:45 AM
AM PEAK VOLUME	1,673

AM PEAK HOUR	2:45 PM
AM PEAK VOLUME	1,297

	1	2	3	4	5	6	TOTAL
TOTAL: AM+PM	16,779	1,503	832	2,986	5	28	22,133
% OF TOTAL	75.8%	6.8%	3.8%	13.5%	0.0%	0.1%	100.0%

CLASS 1	PASSENGER VEHICLES
CLASS 2	2-AXLE TRUCKS
CLASS 3	3-AXLE TRUCKS
CLASS 4	4 OR MORE AXLE TRUCKS
CLASS 5	RV
CLASS 6	BUS

Prepared by NDS/ATD

VOLUME

S Riverside Ave Bet. Slover Ave & Santa Ana Ave

Day: Thursday **City:** Bloomington
Date: 5/10/2018 **Project #:** CA18_6066_037

DAILY TOTALS	NB	SB	EB	WB	Total
	22,640	23,113	0	0	45,753

AM Period	NB		SB		EB	WB	TOTAL	
00:00	132		87				219	
00:15	115		73				188	
00:30	145		82				227	
00:45	108	500	117	359			225	859
01:00	95		95				190	
01:15	107		84				191	
01:30	138		91				229	
01:45	79	419	84	354			163	773
02:00	92		81				173	
02:15	93		105				198	
02:30	116		115				231	
02:45	99	400	96	397			195	797
03:00	113		96				209	
03:15	138		141				279	
03:30	140		185				325	
03:45	133	524	202	624			335	1148
04:00	184		146				330	
04:15	172		148				320	
04:30	170		197				367	
04:45	170	696	252	743			422	1439
05:00	132		213				345	
05:15	151		232				383	
05:30	175		333				508	
05:45	198	656	354	1132			552	1788
06:00	189		314				503	
06:15	210		262				472	
06:30	279		321				600	
06:45	255	933	366	1263			621	2196
07:00	281		357				638	
07:15	264		332				596	
07:30	295		284				579	
07:45	297	1137	345	1318			642	2455
08:00	260		333				593	
08:15	292		315				607	
08:30	314		331				645	
08:45	287	1153	280	1259			567	2412
09:00	304		271				575	
09:15	264		299				563	
09:30	327		248				575	
09:45	304	1199	285	1103			589	2302
10:00	334		240				574	
10:15	298		293				591	
10:30	321		288				609	
10:45	312	1265	281	1102			593	2367
11:00	244		267				511	
11:15	323		273				596	
11:30	306		315				621	
11:45	270	1143	309	1164			579	2307
TOTALS		10025		10818				20843
SPLIT %		48.1%		51.9%				45.6%

PM Period	NB		SB		EB	WB	TOTAL	
12:00	331		337				668	
12:15	334		339				673	
12:30	248		424				672	
12:45	311	1224	381	1481			692	2705
13:00	300		307				607	
13:15	266		292				558	
13:30	344		355				699	
13:45	352	1262	377	1331			729	2593
14:00	347		355				702	
14:15	318		373				691	
14:30	415		340				755	
14:45	399	1479	362	1430			761	2909
15:00	383		360				743	
15:15	387		372				759	
15:30	357		384				741	
15:45	375	1502	365	1481			740	2983
16:00	363		334				697	
16:15	248		335				583	
16:30	338		342				680	
16:45	295	1244	330	1341			625	2585
17:00	280		311				591	
17:15	299		355				654	
17:30	354		375				729	
17:45	332	1265	340	1381			672	2646
18:00	293		266				559	
18:15	290		234				524	
18:30	225		232				457	
18:45	271	1079	204	936			475	2015
19:00	225		190				415	
19:15	184		176				360	
19:30	191		151				342	
19:45	213	813	166	683			379	1496
20:00	217		171				388	
20:15	221		146				367	
20:30	208		149				357	
20:45	163	809	147	613			310	1422
21:00	146		126				272	
21:15	172		134				306	
21:30	221		143				364	
21:45	160	699	166	569			326	1268
22:00	136		152				288	
22:15	176		132				308	
22:30	180		132				312	
22:45	172	664	119	535			291	1199
23:00	217		165				382	
23:15	136		127				263	
23:30	106		115				221	
23:45	116	575	107	514			223	1089
TOTALS		12615		12295				24910
SPLIT %		50.6%		49.4%				54.4%

DAILY TOTALS	NB	SB	EB	WB	Total
	22,640	23,113	0	0	45,753

	NB	SB	EB	WB	Total
AM Peak Hour	10:00	11:45			11:45
AM Pk Volume	1265	1409			2592
Pk Hr Factor	0.947	0.831			0.963
7 - 9 Volume	2290	2577	0	0	4867
7 - 9 Peak Hour	07:45	07:45			07:45
7 - 9 Pk Volume	1163	1324	0	0	2487
Pk Hr Factor	0.926	0.959	0.000	0.000	0.964

	NB	SB	EB	WB	Total
PM Peak Hour	14:30	12:00			14:30
PM Pk Volume	1584	1481			3018
Pk Hr Factor	0.954	0.873			0.991
4 - 6 Volume	2509	2722	0	0	5231
4 - 6 Peak Hour	17:00	17:00			17:00
4 - 6 Pk Volume	1265	1381	0	0	2646
Pk Hr Factor	0.893	0.921	0.000	0.000	0.907

Prepared by NDS/ATD

VOLUME

S Riverside Ave Bet. Slover Ave & Santa Ana Ave

Day: Saturday
Date: 5/12/2018

City: Bloomington
Project #: CA18_6066_037

DAILY TOTALS	NB	SB	EB	WB	Total
	14,971	12,954	0	0	27,925

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	152		113				265		12:00	227		146				373	
00:15	156		91				247		12:15	244		187				431	
00:30	130		91				221		12:30	243		198				441	
00:45	83	521	94	389			177	910	12:45	250	964	169	700			419	1664
01:00	112		67				179		13:00	211		184				395	
01:15	111		83				194		13:15	206		202				408	
01:30	123		76				199		13:30	220		182				402	
01:45	109	455	77	303			186	758	13:45	213	850	215	783			428	1633
02:00	107		88				195		14:00	183		218				401	
02:15	115		71				186		14:15	196		191				387	
02:30	73		56				129		14:30	258		192				450	
02:45	93	388	69	284			162	672	14:45	212	849	187	788			399	1637
03:00	106		47				153		15:00	191		185				376	
03:15	107		101				208		15:15	208		154				362	
03:30	114		144				258		15:30	167		179				346	
03:45	75	402	146	438			221	840	15:45	197	763	201	719			398	1482
04:00	159		96				255		16:00	223		177				400	
04:15	122		107				229		16:15	223		143				366	
04:30	118		135				253		16:30	180		145				325	
04:45	110	509	139	477			249	986	16:45	139	765	164	629			303	1394
05:00	123		91				214		17:00	176		163				339	
05:15	92		119				211		17:15	181		136				317	
05:30	137		128				265		17:30	205		147				352	
05:45	126	478	155	493			281	971	17:45	155	717	170	616			325	1333
06:00	112		110				222		18:00	177		147				324	
06:15	108		133				241		18:15	188		126				314	
06:30	151		141				292		18:30	135		135				270	
06:45	128	499	166	550			294	1049	18:45	158	658	113	521			271	1179
07:00	103		134				237		19:00	163		113				276	
07:15	148		134				282		19:15	131		133				264	
07:30	161		170				331		19:30	126		104				230	
07:45	181	593	179	617			360	1210	19:45	114	534	103	453			217	987
08:00	198		114				312		20:00	126		97				223	
08:15	164		153				317		20:15	123		124				247	
08:30	199		145				344		20:30	117		108				225	
08:45	172	733	166	578			338	1311	20:45	94	460	80	409			174	869
09:00	176		156				332		21:00	107		103				210	
09:15	212		143				355		21:15	127		83				210	
09:30	200		187				387		21:30	96		93				189	
09:45	205	793	169	655			374	1448	21:45	96	426	120	399			216	825
10:00	215		174				389		22:00	105		102				207	
10:15	238		214				452		22:15	115		111				226	
10:30	230		145				375		22:30	147		98				245	
10:45	235	918	161	694			396	1612	22:45	117	484	106	417			223	901
11:00	196		174				370		23:00	111		85				196	
11:15	205		152				357		23:15	96		107				203	
11:30	188		190				378		23:30	119		81				200	
11:45	207	796	184	700			391	1496	23:45	90	416	69	342			159	758
TOTALS		7085		6178				**13263**	**TOTALS**		7886		6776				**14662**
SPLIT %		53.4%		46.6%				**47.5%**	**SPLIT %**		53.8%		46.2%				**52.5%**

DAILY TOTALS	NB	SB	EB	WB	Total
	14,971	12,954	0	0	27,925

	NB	SB	EB	WB	Total		NB	SB	EB	WB	Total
AM Peak Hour	11:45	09:30			**11:45**	**PM Peak Hour**	12:00	13:15			**12:15**
AM Pk Volume	921	744			**1636**	**PM Pk Volume**	964	817			**1686**
Pk Hr Factor	0.944	0.869			**0.927**	**Pk Hr Factor**	0.964	0.937			**0.956**
7 - 9 Volume	1326	1195	0	0	**2521**	**4 - 6 Volume**	1482	1245	0	0	**2727**
7 - 9 Peak Hour	07:45	07:00			**07:45**	**4 - 6 Peak Hour**	16:00	16:00			**16:00**
7 - 9 Pk Volume	742	617	0	0	**1333**	**4 - 6 Pk Volume**	765	629	0	0	**1394**
Pk Hr Factor	0.932	0.862	0.000	0.000	**0.926**	**Pk Hr Factor**	0.858	0.888	0.000	0.000	**0.871**

Appendix E – PCE Calculations

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:	LOCATION:	Rialto	PROJECT #:	SC2522
2/12/20	NORTH & SOUTH:	Riverside	LOCATION #:	1
WEDNESDAY	EAST & WEST:	Valley	CONTROL:	SIGNAL

PCE Adjusted	NOTES:										
	Class	1	2	3	4	5	6			AM	▲ N
	Factor	1	1.5	2	3	2	2			PM	◄ W E ►
										MD	S ▼
										OTHER	
										OTHER	

	NORTHBOUND Riverside			SOUTHBOUND Riverside			EASTBOUND Valley			WESTBOUND Valley				U-TURNS				
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB	TTL
LANES:	2	2.5	0.5	1	2.5	0.5	1	2	1	1	2	1						
AM 7:00 AM	73	147	36	17	286	8	5	51	130	41	49	12	853					0
7:15 AM	100	160	19	14	267	6	11	32	154	61	36	4	861					0
7:30 AM	90	164	42	12	326	7	8	51	142	44	51	13	948					0
7:45 AM	94	158	63	19	270	8	13	52	123	34	35	8	875					0
8:00 AM	64	146	52	10	264	17	10	77	125	34	36	16	849					0
8:15 AM	73	148	58	19	211	8	15	38	95	48	55	13	779					0
8:30 AM	76	164	55	14	202	14	16	45	106	34	37	22	783					0
8:45 AM	85	198	44	9	180	12	11	37	91	46	31	14	756					0
VOLUMES	654	1,282	368	114	2,004	80	89	381	965	340	328	101	6,703	0	0	0	0	0
APPROACH %	28%	56%	16%	5%	91%	4%	6%	27%	67%	44%	43%	13%						
APP/DEPART	2,303	/	1,472	2,197	/	3,309	1,434	/	862	769	/	1,061	0					
BEGIN PEAK HR		7:00 AM																
VOLUMES	357	628	160	62	1,148	29	37	185	548	179	170	37	3,537					
APPROACH %	31%	55%	14%	5%	93%	2%	5%	24%	71%	46%	44%	9%						
PEAK HR FACTOR		0.910			0.898			0.959			0.904		0.933					
APP/DEPART	1,145	/	701	1,238	/	1,875	769	/	406	385	/	555	0					
PM 4:00 PM	142	373	54	21	206	13	13	70	125	44	89	29	1,178					0
4:15 PM	130	295	38	19	209	13	22	69	114	46	52	29	1,034					0
4:30 PM	105	347	54	16	195	6	21	63	130	35	60	32	1,062					0
4:45 PM	135	311	41	23	202	15	25	64	126	54	80	29	1,103					0
5:00 PM	140	313	80	16	195	12	23	64	130	50	73	39	1,133					0
5:15 PM	148	319	34	22	169	9	14	78	133	50	93	32	1,100					0
5:30 PM	148	341	46	23	233	21	32	58	115	49	69	31	1,162					0
5:45 PM	131	286	36	21	189	17	25	53	98	37	59	24	974					0
VOLUMES	1,078	2,584	382	160	1,597	105	175	517	969	363	572	244	8,745	0	0	0	0	0
APPROACH %	27%	64%	9%	9%	86%	6%	11%	31%	58%	31%	49%	21%						
APP/DEPART	4,044	/	3,002	1,862	/	2,929	1,661	/	1,059	1,179	/	1,755	0					
BEGIN PEAK HR		4:45 PM																
VOLUMES	570	1,284	200	84	799	57	94	264	503	202	314	130	4,497					
APPROACH %	28%	63%	10%	9%	85%	6%	11%	31%	58%	31%	49%	20%						
PEAK HR FACTOR		0.960			0.849			0.955			0.922		0.968					
APP/DEPART	2,053	/	1,507	939	/	1,503	860	/	548	646	/	940	0					

Riverside

NORTH SIDE

Valley WEST SIDE

EAST SIDE **Valley**

SOUTH SIDE

Riverside

Approach	AM Peak Hour (7:00-8:00am) Passenger Vehicles	AM Truck Volumes 2-axle 1.5	AM Truck Volumes 3-axle 2.0	AM Truck Volumes 4-axle 3.0	AM Truck Volumes Total Trucks	AM Truck %	AM PCE	AM Average PCE	AM Total PCE Volume	PM Peak Hour (5:00-6:00pm) Passenger Vehicles	PM Truck Volumes 2-axle 1.5	PM Truck Volumes 3-axle 2.0	PM Truck Volumes 4-axle 3.0	PM Truck Volumes Total Trucks	PM Truck %	PM PCE	PM Average PCE	PM Total PCE Volume
SBL	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
SBT	972	18	2	5	25	2.5%	46	1.8	**1018**	1044	10	8	10	28	2.6%	61	2.2	**1105**
SBR	507	5	0	6	11	2.1%	26	2.4	**533**	369	3	3	2	8	2.1%	17	2.1	**386**
SBU	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
NBL	55	18	17	58	93	62.8%	235	2.5	**290**	173	2	10	35	47	21.4%	128	2.7	**301**
NBT	769	23	4	24	51	6.2%	115	2.3	**884**	1459	15	6	8	29	1.9%	59	2.0	**1518**
NBR	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
NBU	13	0	0	0	0	0.0%	0	0.0	**13**	0	0	0	0	0	0.0%	0	0.0	**0**
EBL	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
EBT	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
EBR	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
EBU	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
WBL	350	19	7	44	70	16.7%	175	2.5	**525**	380	13	12	59	84	18.1%	221	2.6	**601**
WBT	5	0	0	0	0	0.0%	0	0.0	**5**	3	0	0	0	0	0.0%	0	0.0	**3**
WBR	337	11	0	2	13	3.7%	23	1.8	**360**	459	4	1	5	10	2.1%	23	2.3	**482**
WBU	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
North Approach Volumes																		
Entering	1479	23	2	11	36	2.4%	72	2.0	**1551**	1413	13	11	12	36	2.5%	78	2.2	**1491**
Exiting	1106	34	4	26	64	5.5%	137	2.1	**1243**	1918	19	7	13	39	2.0%	82	2.1	**2000**
Total	2585	57	6	37	100	3.7%	209	2.1	**2794**	3331	32	18	25	75	2.2%	159	2.1	**3490**
South Approach Volumes																		
Entering	837	41	21	82	144	14.7%	350	2.4	**1187**	1632	17	16	43	76	4.4%	187	2.5	**1819**
Exiting	1335	37	9	49	95	6.6%	221	2.3	**1556**	1424	23	20	69	112	7.3%	282	2.5	**1706**
Total	2172	78	30	131	239	9.9%	570	2.4	**2742**	3056	40	36	112	188	5.8%	468	2.5	**3524**
West Approach Volumes																		
Entering	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
Exiting	567	23	17	64	104	15.5%	261	2.5	**828**	545	5	13	37	55	9.2%	145	2.6	**690**
Total	567	23	17	64	104	15.5%	261	2.5	**828**	545	5	13	37	55	9.2%	145	2.6	**690**
East Approach Volumes																		
Entering	692	30	7	46	83	10.7%	197	2.4	**889**	842	17	13	64	94	10.0%	244	2.6	**1086**
Exiting	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
Total	692	30	7	46	83	10.7%	197	2.4	**889**	842	17	13	64	94	10.0%	244	2.6	**1086**
Total Approach Volumes																		
Entering	3008	94	30	139	263	8.0%	618	2.3	**3626**	3887	47	40	119	206	5.0%	508	2.5	**4395**
Exiting	3008	94	30	139	263	8.0%	618	2.3	**3626**	3887	47	40	119	206	5.0%	508	2.5	**4395**
Total	6016	188	60	278	526	8.0%	1236	2.3	**7252**	7774	94	80	238	412	5.0%	1015	2.5	**8789**

Approach	AM Peak Hour (7:00-8:00am)									PM Peak Hour (5:00-6:00pm)								
	Passenger Vehicles	Truck Volumes 2-axle 1.5	3-axle 2.0	4-axle 3.0	Total Trucks	Truck %	PCE	Average PCE	**Total PCE Volume**	Passenger Vehicles	Truck Volumes 2-axle 1.5	3-axle 2.0	4-axle 3.0	Total Trucks	Truck %	PCE	Average PCE	**Total PCE Volume**
SBL	362	8	1	2	11	2.9%	20	1.8	**382**	431	2	0	3	5	1.1%	12	2.4	**443**
SBT	963	27	10	46	83	7.9%	199	2.4	**1162**	1015	21	20	66	107	9.5%	270	2.5	**1285**
SBR	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
SBU	2	0	0	0	0	0.0%	0	0.0	**2**	1	0	0	0	0	0.0%	0	0.0	**1**
NBL	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
NBT	534	34	20	79	133	19.9%	328	2.5	**862**	1103	13	15	39	67	5.7%	167	2.5	**1270**
NBR	195	12	10	51	73	27.2%	191	2.6	**386**	427	9	10	45	64	13.0%	169	2.6	**596**
NBU	1	0	0	0	0	0.0%	0	0.0	**1**	0	0	0	0	0	0.0%	0	0.0	**0**
EBL	299	9	2	2	13	4.2%	24	1.8	**323**	558	2	2	2	6	1.1%	13	2.2	**571**
EBT	5	2	0	0	2	28.6%	3	1.5	**8**	0	0	0	0	0	0.0%	0	0.0	**0**
EBR	246	11	10	56	77	23.8%	205	2.7	**451**	231	7	18	50	75	24.5%	197	2.6	**428**
EBU	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
WBL	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
WBT	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
WBR	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
WBU	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
North Approach Volumes																		
Entering	1327	35	11	48	94	6.6%	219	2.3	**1546**	1447	23	20	69	112	7.2%	282	2.5	**1729**
Exiting	835	43	22	81	146	14.9%	352	2.4	**1187**	1662	15	17	41	73	4.2%	180	2.5	**1842**
Total	2162	78	33	129	240	10.0%	570	2.4	**2732**	3109	38	37	110	185	5.6%	461	2.5	**3570**
South Approach Volumes																		
Entering	730	46	30	130	206	22.0%	519	2.5	**1249**	1530	22	25	84	131	7.9%	335	2.6	**1865**
Exiting	1210	38	20	102	160	11.7%	403	2.5	**1613**	1246	28	38	116	182	12.7%	466	2.6	**1712**
Total	1940	84	50	232	366	15.9%	922	2.5	**2862**	2776	50	63	200	313	10.1%	801	2.6	**3577**
West Approach Volumes																		
Entering	550	22	12	58	92	14.3%	231	2.5	**781**	789	9	20	52	81	9.3%	210	2.6	**999**
Exiting	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
Total	550	22	12	58	92	14.3%	231	2.5	**781**	789	9	20	52	81	9.3%	210	2.6	**999**
East Approach Volumes																		
Entering	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
Exiting	562	22	11	53	86	13.3%	214	2.5	**776**	858	11	10	48	69	7.4%	181	2.6	**1039**
Total	562	22	11	53	86	13.3%	214	2.5	**776**	858	11	10	48	69	7.4%	181	2.6	**1039**
Total Approach Volumes																		
Entering	2607	103	53	236	392	13.1%	969	2.5	**3576**	3766	54	65	205	324	7.9%	826	2.5	**4592**
Exiting	2607	103	53	236	392	13.1%	969	2.5	**3576**	3766	54	65	205	324	7.9%	826	2.5	**4592**
Total	5214	206	106	472	784	13.1%	1937	2.5	**7151**	7532	108	130	410	648	7.9%	1652	2.5	**9184**

Approach	AM Peak Hour (7:00-8:00am) Passenger Vehicles	Truck Volumes 2-axle 1.5	3-axle 2.0	4-axle 3.0	Total Trucks	Truck %	PCE	Average PCE	Total PCE Volume	PM Peak Hour (5:00-6:00pm) Passenger Vehicles	Truck Volumes 2-axle 1.5	3-axle 2.0	4-axle 3.0	Total Trucks	Truck %	PCE	Average PCE	Total PCE Volume
SBL	19	3	3	2	8	29.6%	17	2.1	**36**	5	3	2	4	9	64.3%	21	2.3	**26**
SBT	828	27	16	84	127	13.3%	325	2.6	**1153**	1035	23	31	92	146	12.4%	373	2.6	**1408**
SBR	348	11	1	15	27	7.2%	64	2.4	**412**	194	6	6	20	32	14.2%	81	2.5	**275**
SBU	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
NBL	48	3	3	7	13	21.3%	32	2.5	**80**	17	2	1	2	5	22.7%	11	2.2	**28**
NBT	471	36	22	113	171	26.6%	437	2.6	**908**	1066	15	19	71	105	9.0%	274	2.6	**1340**
NBR	8	1	1	5	7	46.7%	19	2.7	**27**	10	0	1	3	4	28.6%	11	2.8	**21**
NBU	1	0	0	0	0	0.0%	0	0.0	**1**	6	0	0	0	0	0.0%	0	0.0	**6**
EBL	208	8	4	6	18	8.0%	38	2.1	**246**	361	6	5	6	17	4.5%	37	2.2	**398**
EBT	16	2	0	0	2	11.1%	3	1.5	**19**	102	2	0	3	5	4.7%	12	2.4	**114**
EBR	20	3	8	9	20	50.0%	48	2.4	**68**	97	2	5	11	18	15.7%	46	2.6	**143**
EBU	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
WBL	12	3	1	3	7	36.8%	16	2.3	**28**	4	1	4	6	11	73.3%	28	2.5	**32**
WBT	17	1	1	2	4	19.0%	10	2.5	**27**	4	2	2	6	10	71.4%	25	2.5	**29**
WBR	14	2	3	2	7	33.3%	15	2.1	**29**	50	1	0	6	7	12.3%	20	2.9	**70**
WBU	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
North Approach Volumes																		
Entering	1195	41	20	101	162	11.9%	405	2.5	**1600**	1234	32	39	116	187	13.2%	474	2.5	**1708**
Exiting	693	46	29	121	196	22.0%	490	2.5	**1183**	1477	22	24	83	129	8.0%	330	2.6	**1807**
Total	1888	87	49	222	358	15.9%	895	2.5	**2783**	2711	54	63	199	316	10.4%	804	2.5	**3515**
South Approach Volumes																		
Entering	528	40	26	125	191	26.6%	487	2.5	**1015**	1099	17	21	76	114	9.4%	296	2.6	**1395**
Exiting	861	33	25	96	154	15.2%	388	2.5	**1249**	1142	26	40	109	175	13.3%	446	2.5	**1588**
Total	1389	73	51	221	345	19.9%	875	2.5	**2264**	2241	43	61	185	289	11.4%	742	2.6	**2983**
West Approach Volumes																		
Entering	244	13	12	15	40	14.1%	89	2.2	**333**	560	10	10	20	40	6.7%	95	2.4	**655**
Exiting	413	15	5	24	44	9.6%	105	2.4	**518**	215	10	9	28	47	17.9%	117	2.5	**332**
Total	657	28	17	39	84	11.3%	193	2.3	**850**	775	20	19	48	87	10.1%	212	2.4	**987**
East Approach Volumes																		
Entering	43	6	5	7	18	29.5%	40	2.2	**83**	58	4	6	18	28	32.6%	72	2.6	**130**
Exiting	43	6	4	7	17	28.3%	38	2.2	**81**	117	5	3	10	18	13.3%	44	2.4	**161**
Total	86	12	9	14	35	28.9%	78	2.2	**164**	175	9	9	28	46	20.8%	116	2.5	**291**
Total Approach Volumes																		
Entering	2010	100	63	248	411	17.0%	1020	2.5	**3030**	2951	63	76	230	369	11.1%	937	2.5	**3888**
Exiting	2010	100	63	248	411	17.0%	1020	2.5	**3030**	2951	63	76	230	369	11.1%	937	2.5	**3888**
Total	4020	200	126	496	822	17.0%	2040	2.5	**6060**	5902	126	152	460	738	11.1%	1873	2.5	**7775**

Approach	AM Peak Hour (7:00-8:00am) Passenger Vehicles	Truck Volumes 2-axle 1.5	3-axle 2.0	4-axle 3.0	Total Trucks	Truck %	PCE	Average PCE	Total PCE Volume	PM Peak Hour (5:00-6:00pm) Passenger Vehicles	Truck Volumes 2-axle 1.5	3-axle 2.0	4-axle 3.0	Total Trucks	Truck %	PCE	Average PCE	Total PCE Volume
SBL	22	2	1	11	14	38.9%	38	2.7	**60**	14	3	5	8	16	53.3%	39	2.4	**53**
SBT	749	32	15	73	120	13.8%	297	2.5	**1046**	1076	21	35	90	146	11.9%	372	2.5	**1448**
SBR	88	4	2	8	14	13.7%	34	2.4	**122**	61	4	1	2	7	10.3%	14	2.0	**75**
SBU	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
NBL	65	6	2	1	9	12.2%	16	1.8	**81**	63	1	1	5	7	10.0%	19	2.7	**82**
NBT	523	31	20	95	146	21.8%	372	2.5	**895**	952	14	20	63	97	9.2%	250	2.6	**1202**
NBR	6	0	2	7	9	60.0%	25	2.8	**31**	4	0	1	4	5	55.6%	14	2.8	**18**
NBU	1	0	0	0	0	0.0%	0	0.0	**1**	0	0	0	0	0	0.0%	0	0.0	**0**
EBL	37	4	2	5	11	22.9%	25	2.3	**62**	78	0	2	7	9	10.3%	25	2.8	**103**
EBT	3	2	18	3	23	88.5%	48	2.1	**51**	7	0	2	1	3	30.0%	7	2.3	**14**
EBR	41	0	1	5	6	12.8%	17	2.8	**58**	63	0	3	7	10	13.7%	27	2.7	**90**
EBU	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
WBL	3	0	6	6	12	80.0%	30	2.5	**33**	18	0	5	3	8	30.8%	19	2.4	**37**
WBT	2	0	1	14	15	88.2%	44	2.9	**46**	11	1	1	1	3	21.4%	7	2.3	**18**
WBR	4	4	4	21	29	87.9%	77	2.7	**81**	46	1	1	4	6	11.5%	16	2.7	**62**
WBU	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
North Approach Volumes																		
Entering	859	38	18	92	148	14.7%	369	2.5	**1228**	1151	28	41	100	169	12.8%	424	2.5	**1575**
Exiting	564	39	26	121	186	24.8%	474	2.5	**1038**	1076	15	23	74	112	9.4%	291	2.6	**1367**
Total	1423	77	44	213	334	19.0%	843	2.5	**2266**	2227	43	64	174	281	11.2%	715	2.5	**2942**
South Approach Volumes																		
Entering	595	37	24	103	164	21.6%	413	2.5	**1008**	1019	15	22	72	109	9.7%	283	2.6	**1302**
Exiting	794	32	22	84	138	14.8%	344	2.5	**1138**	1157	21	43	100	164	12.4%	418	2.5	**1575**
Total	1389	69	46	187	302	17.9%	757	2.5	**2146**	2176	36	65	172	273	11.1%	700	2.6	**2876**
West Approach Volumes																		
Entering	81	6	21	13	40	33.1%	90	2.3	**171**	148	0	7	15	22	12.9%	59	2.7	**207**
Exiting	155	10	5	23	38	19.7%	94	2.5	**249**	135	6	3	8	17	11.2%	39	2.3	**174**
Total	236	16	26	36	78	24.8%	184	2.4	**420**	283	6	10	23	39	12.1%	98	2.5	**381**
East Approach Volumes																		
Entering	9	4	11	41	56	86.2%	151	2.7	**160**	75	2	7	8	17	18.5%	41	2.4	**116**
Exiting	31	4	21	21	46	59.7%	111	2.4	**142**	25	3	8	13	24	49.0%	60	2.5	**85**
Total	40	8	32	62	102	71.8%	262	2.6	**302**	100	5	15	21	41	29.1%	101	2.5	**201**
Total Approach Volumes																		
Entering	1544	85	74	249	408	20.9%	1023	2.5	**2567**	2393	45	77	195	317	11.7%	807	2.5	**3200**
Exiting	1544	85	74	249	408	20.9%	1023	2.5	**2567**	2393	45	77	195	317	11.7%	807	2.5	**3200**
Total	3088	170	148	498	816	20.9%	2045	2.5	**5133**	4786	90	154	390	634	11.7%	1613	2.5	**6399**

Approach	AM Peak Hour (7:00-8:00am)									PM Peak Hour (5:00-6:00pm)								
	Passenger Vehicles	Truck Volumes 2-axle 1.5	3-axle 2.0	4-axle 3.0	Total Trucks	Truck %	PCE	Average PCE	**Total PCE Volume**	Passenger Vehicles	Truck Volumes 2-axle 1.5	3-axle 2.0	4-axle 3.0	Total Trucks	Truck %	PCE	Average PCE	**Total PCE Volume**
SBL	16	0	1	8	9	36.0%	26	2.9	**42**	9	0	2	7	9	50.0%	25	2.8	**34**
SBT	753	29	22	76	127	14.4%	316	2.5	**1069**	1174	21	39	94	154	11.6%	392	2.5	**1566**
SBR	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
SBU	0	0	0	0	0	0.0%	0	0.0	**0**	1	0	0	0	0	0.0%	0	0.0	**1**
NBL	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
NBT	582	32	24	91	147	20.2%	369	2.5	**951**	949	17	19	62	98	9.4%	250	2.6	**1199**
NBR	4	0	0	1	1	20.0%	3	3.0	**7**	6	0	0	1	1	14.3%	3	3.0	**9**
NBU	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
EBL	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
EBT	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
EBR	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
EBU	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
WBL	0	0	0	0	0	0.0%	0	0.0	**0**	3	0	0	0	0	0.0%	0	0.0	**3**
WBT	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
WBR	7	0	3	7	10	58.8%	27	2.7	**34**	14	0	4	4	8	36.4%	20	2.5	**34**
WBU	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
North Approach Volumes																		
Entering	769	29	23	84	136	15.0%	342	2.5	**1111**	1184	21	41	101	163	12.1%	417	2.6	**1601**
Exiting	589	32	27	98	157	21.0%	396	2.5	**985**	964	17	23	66	106	9.9%	270	2.5	**1234**
Total	1358	61	50	182	293	17.7%	738	2.5	**2096**	2148	38	64	167	269	11.1%	686	2.6	**2834**
South Approach Volumes																		
Entering	586	32	24	92	148	20.2%	372	2.5	**958**	955	17	19	63	99	9.4%	253	2.6	**1208**
Exiting	753	29	22	76	127	14.4%	316	2.5	**1069**	1177	21	39	94	154	11.6%	392	2.5	**1569**
Total	1339	61	46	168	275	17.0%	688	2.5	**2027**	2132	38	58	157	253	10.6%	644	2.5	**2776**
West Approach Volumes																		
Entering	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
Exiting	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
Total	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
East Approach Volumes																		
Entering	7	0	3	7	10	58.8%	27	2.7	**34**	17	0	4	4	8	32.0%	20	2.5	**37**
Exiting	20	0	1	9	10	33.3%	29	2.9	**49**	15	0	2	8	10	40.0%	28	2.8	**43**
Total	27	0	4	16	20	42.6%	56	2.8	**83**	32	0	6	12	18	36.0%	48	2.7	**80**
Total Approach Volumes																		
Entering	1362	61	50	183	294	17.8%	741	2.5	**2103**	2156	38	64	168	270	11.1%	689	2.6	**2845**
Exiting	1362	61	50	183	294	17.8%	741	2.5	**2103**	2156	38	64	168	270	11.1%	689	2.6	**2845**
Total	2724	122	100	366	588	17.8%	1481	2.5	**4205**	4312	76	128	336	540	11.1%	1378	2.6	**5690**

Approach	AM Peak Hour (7:00-8:00am)									PM Peak Hour (5:00-6:00pm)								
	Passenger Vehicles	Truck Volumes 2-axle 1.5	3-axle 2.0	4-axle 3.0	Total Trucks	Truck %	PCE	Average PCE	**Total PCE Volume**	Passenger Vehicles	Truck Volumes 2-axle 1.5	3-axle 2.0	4-axle 3.0	Total Trucks	Truck %	PCE	Average PCE	**Total PCE Volume**
SBL	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
SBT	632	28	31	104	163	20.5%	416	2.6	**1048**	1149	12	42	87	141	10.9%	363	2.6	**1512**
SBR	31	2	0	2	4	11.4%	9	2.3	**40**	39	4	0	2	6	13.3%	12	2.0	**51**
SBU	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
NBL	56	4	2	2	8	12.5%	16	2.0	**72**	68	1	3	6	10	12.8%	26	2.6	**94**
NBT	476	29	27	118	174	26.8%	452	2.6	**928**	935	13	17	58	88	8.6%	228	2.6	**1163**
NBR	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
NBU	0	0	0	0	0	0.0%	0	0.0	**0**	2	0	0	0	0	0.0%	0	0.0	**2**
EBL	35	3	3	3	9	20.5%	20	2.2	**55**	29	0	0	0	0	0.0%	0	0.0	**29**
EBT	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
EBR	57	15	6	13	34	37.4%	74	2.2	**131**	130	0	2	5	7	5.1%	19	2.7	**149**
EBU	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
WBL					0	0.0%	0	0.0	**0**					0	0.0%	0	0.0	**0**
WBT					0	0.0%	0	0.0	**0**					0	0.0%	0	0.0	**0**
WBR					0	0.0%	0	0.0	**0**					0	0.0%	0	0.0	**0**
WBU					0	0.0%	0	0.0	**0**					0	0.0%	0	0.0	**0**
North Approach Volumes																		
Entering	663	30	31	106	167	20.1%	425	2.5	**1088**	1188	16	42	89	147	11.0%	375	2.6	**1563**
Exiting	511	32	30	121	183	26.4%	471	2.6	**982**	964	13	17	58	88	8.4%	228	2.6	**1192**
Total	1174	62	61	227	350	23.0%	896	2.6	**2070**	2152	29	59	147	235	9.8%	603	2.6	**2755**
South Approach Volumes																		
Entering	532	33	29	120	182	25.5%	468	2.6	**1000**	1005	14	20	64	98	8.9%	253	2.6	**1258**
Exiting	689	43	37	117	197	22.2%	490	2.5	**1179**	1281	12	44	92	148	10.4%	382	2.6	**1663**
Total	1221	76	66	237	379	23.7%	957	2.5	**2178**	2286	26	64	156	246	9.7%	635	2.6	**2921**
West Approach Volumes																		
Entering	92	18	9	16	43	31.9%	93	2.2	**185**	159	0	2	5	7	4.2%	19	2.7	**178**
Exiting	87	6	2	4	12	12.1%	25	2.1	**112**	107	5	3	8	16	13.0%	38	2.4	**145**
Total	179	24	11	20	55	23.5%	118	2.1	**297**	266	5	5	13	23	8.0%	57	2.5	**323**
East Approach Volumes																		
Entering	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
Exiting	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
Total	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
Total Approach Volumes																		
Entering	1287	81	69	242	392	23.3%	986	2.5	**2273**	2352	30	64	158	252	9.7%	647	2.6	**2999**
Exiting	1287	81	69	242	392	23.3%	986	2.5	**2273**	2352	30	64	158	252	9.7%	647	2.6	**2999**
Total	2574	162	138	484	784	23.3%	1971	2.5	**4545**	4704	60	128	316	504	9.7%	1294	2.6	**5998**

Approach	AM Peak Hour (7:00-8:00am)									PM Peak Hour (5:00-6:00pm)								
	Passenger Vehicles	Truck Volumes 2-axle 1.5	3-axle 2.0	4-axle 3.0	Total Trucks	Truck %	PCE	Average PCE*	Total PCE Volume	Passenger Vehicles	Truck Volumes 2-axle 1.5	3-axle 2.0	4-axle 3.0	Total Trucks	Truck %	PCE	Average PCE*	Total PCE Volume
SBL	2	Data not available			2	50.0%	5	2.5	**7**	4	Data not available			6	60.0%	15	2.6	**19**
SBT	771				139	15.3%	350		**1121**	820				121	12.9%	310		**1130**
SBR	107				49	31.4%	123		**230**	140				35	20.0%	90		**230**
SBU	1				0	0.0%	0		**1**	1				0	0.0%	0		**1**
NBL	9				9	50.0%	23	2.5	**32**	21				2	8.7%	5	2.6	**26**
NBT	583				121	17.2%	304		**887**	755				95	11.2%	243		**998**
NBR	12				4	25.0%	10		**22**	14				3	17.6%	8		**22**
NBU	0				0	0.0%	0		**0**	0				0	0.0%	0		**0**
EBL	65				49	43.0%	123	2.5	**188**	178				20	10.1%	50	2.5	**228**
EBT	4				13	76.5%	33		**37**	0				17	0.0%	43		**43**
EBR	19				3	13.6%	8		**27**	46				9	16.4%	23		**69**
EBU	0				0	0.0%	0		**0**	3				1	25.0%	3		**6**
WBL	3				4	57.1%	11	2.7	**14**	6				0	0.0%	0	2.5	**6**
WBT	0				1	0.0%	3		**3**	1				0	0.0%	0		**1**
WBR	2				1	33.3%	3		**5**	1				2	66.7%	5		**6**
WBU	0				0	0.0%	0		**0**	1				0	0.0%	0		**1**
North Approach Volumes																		
Entering	881	Data not available			190	17.7%	478	2.5	**1359**	965	Data not available			162	14.4%	414	2.6	**1379**
Exiting	651				171	20.8%	431	2.5	**1082**	935				117	11.1%	298	2.5	**1233**
Total	1532				361	19.1%	909	2.5	**2441**	1900				279	12.8%	712	2.6	**2612**
South Approach Volumes																		
Entering	604	Data not available			134	18.2%	337	2.5	**941**	790	Data not available			100	11.2%	256	2.6	**1046**
Exiting	793				146	15.5%	363	2.5	**1156**	872				130	13.0%	331	2.5	**1203**
Total	1397				280	16.7%	701	2.5	**2098**	1662				230	12.2%	585	2.5	**2247**
West Approach Volumes																		
Entering	88	Data not available			65	42.5%	176	2.7	**264**	227	Data not available			47	17.2%	118	2.5	**345**
Exiting	116				59	33.7%	171	2.9	**287**	165				38	18.7%	106	2.8	**271**
Total	204				124	37.8%	347	2.8	**551**	392				85	17.8%	227	2.7	**619**
East Approach Volumes																		
Entering	5	Data not available			6	54.5%	16	2.7	**21**	9	Data not available			2	18.2%	5	2.5	**14**
Exiting	18				19	51.4%	55	2.9	**73**	19				26	57.8%	73	2.8	**92**
Total	23				25	52.1%	70	2.8	**93**	28				28	50.0%	75	2.7	**103**
Total Approach Volumes																		
Entering	1578	Data not available			395	20.0%	996	2.5	**2574**	1991	Data not available			311	13.5%	794	2.6	**2785**
Exiting	1578				395	20.0%	996	2.5	**2574**	1991				311	13.5%	794	2.6	**2785**
Total	3156				790	20.0%	1990	2.5	**5146**	3982				622	13.5%	1587	2.6	**5569**

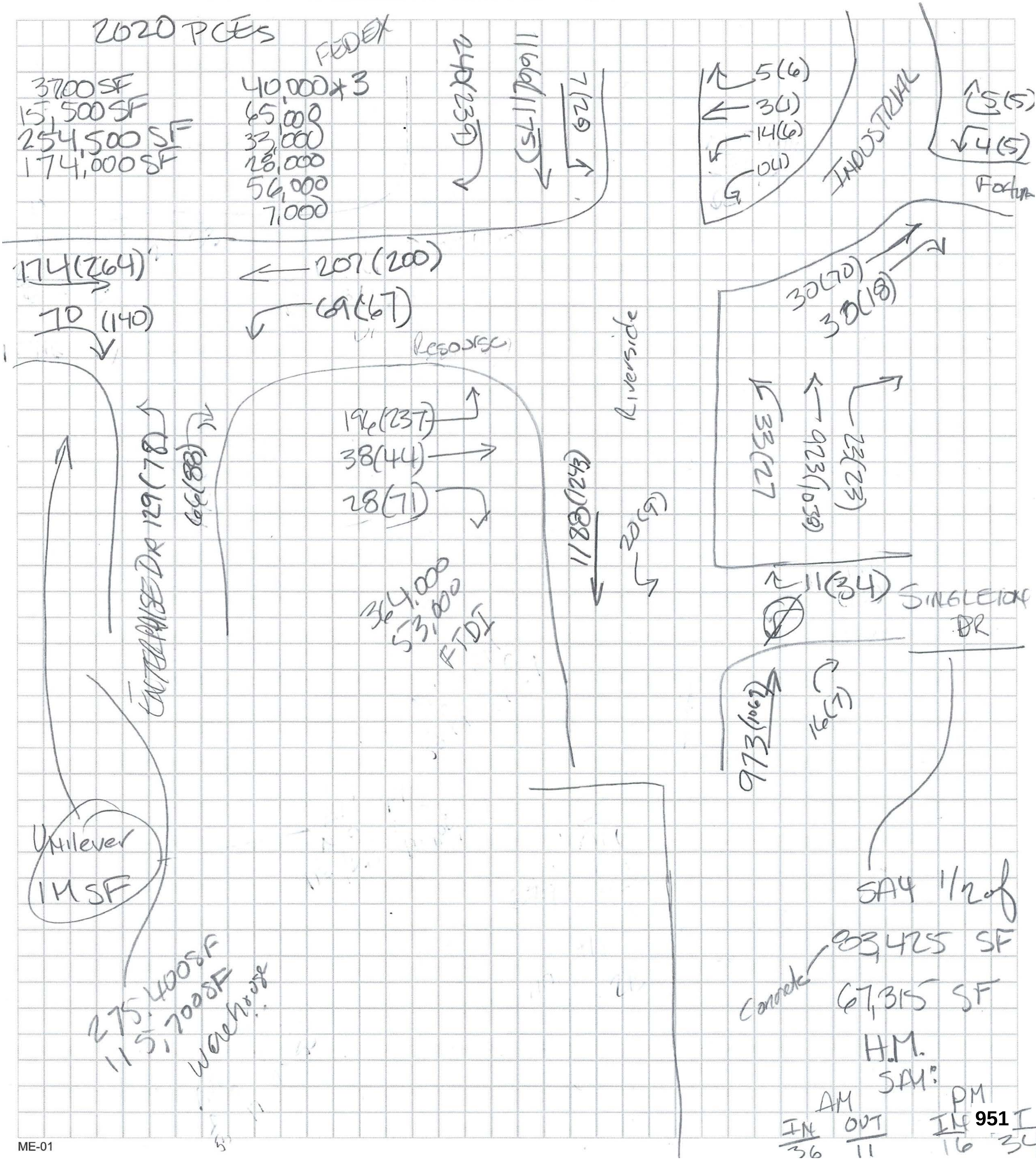
*PCE average taken from nearby intersection of S Riverside with Industrial Dr (#5 of this study)

CALCULATION SHEET

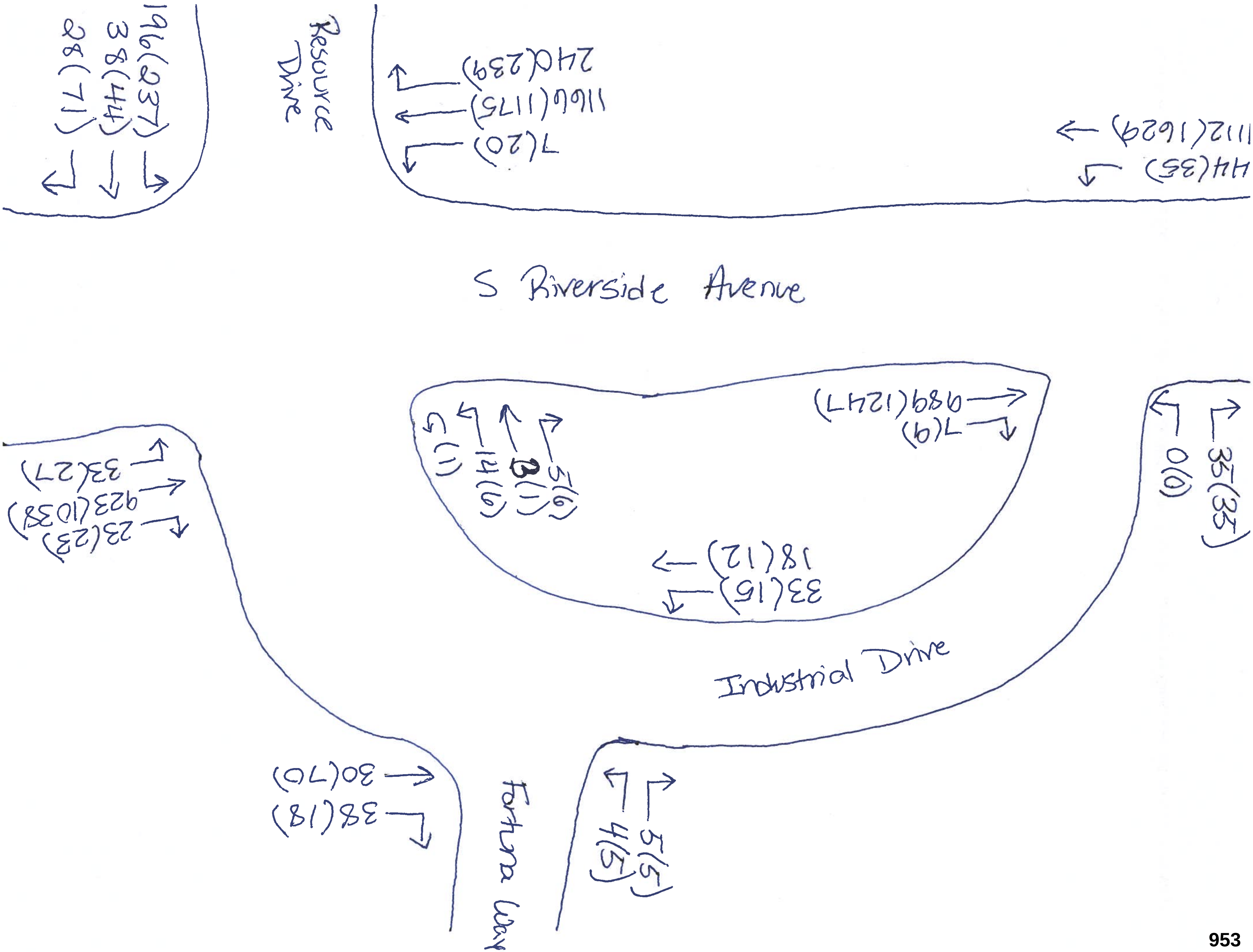
PAGE OF

CLIENT SUBJECT Prepared By Date

PROJECT No. Use 154 Reviewed By Date



Approach	AM Peak Hour (7:00-8:00am)									PM Peak Hour (5:00-6:00pm)								
	Passenger Vehicles	Truck Volumes 2-axle 1.5	3-axle 2.0	4-axle 3.0	Total Trucks	Truck %	PCE	Average PCE	**Total PCE Volume**	Passenger Vehicles	Truck Volumes 2-axle 1.5	3-axle 2.0	4-axle 3.0	Total Trucks	Truck %	PCE	Average PCE	**Total PCE Volume**
SBL	23	4	3	5	12	34.3%	27	2.3	**50**	64	0	1	11	12	15.8%	35	2.9	**99**
SBT	731	17	10	34	61	7.7%	148	2.4	**879**	843	12	18	20	50	5.6%	114	2.3	**957**
SBR	66	6	5	20	31	32.0%	79	2.5	**145**	65	2	11	15	28	30.1%	70	2.5	**135**
SBU	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
NBL	76	10	1	8	19	20.0%	41	2.2	**117**	79	9	4	4	17	17.7%	34	2.0	**113**
NBT	514	30	7	24	61	10.6%	131	2.1	**645**	599	10	11	25	46	7.1%	112	2.4	**711**
NBR	8	8	3	3	14	63.6%	27	1.9	**35**	60	1	6	1	8	11.8%	17	2.1	**77**
NBU	7	0	0	0	0	0.0%	0	0.0	**7**	12	0	0	0	0	0.0%	0	0.0	**12**
EBL	81	6	5	12	23	22.1%	55	2.4	**136**	79	3	1	23	27	25.5%	76	2.8	**155**
EBT	73	5	3	2	10	12.0%	20	2.0	**93**	368	8	2	5	15	3.9%	31	2.1	**399**
EBR	42	6	4	5	15	26.3%	32	2.1	**74**	141	6	3	6	15	9.6%	33	2.2	**174**
EBU	0	0	0	0	0	0.0%	0	0.0	**0**	1	0	0	0	0	0.0%	0	0.0	**1**
WBL	69	5	7	1	13	15.9%	25	1.9	**94**	60	1	2	2	5	7.7%	12	2.4	**72**
WBT	222	5	4	12	21	8.6%	52	2.5	**274**	123	7	2	9	18	12.8%	42	2.3	**165**
WBR	22	4	7	12	23	51.1%	56	2.4	**78**	26	0	5	23	28	51.9%	79	2.8	**105**
WBU	0	0	0	0	0	0.0%	0	0.0	**0**	0	0	0	0	0	0.0%	0	0.0	**0**
North Approach Volumes																		
Entering	820	27	18	59	104	11.3%	254	2.4	**1074**	972	14	30	46	90	8.5%	219	2.4	**1191**
Exiting	617	40	19	48	107	14.8%	242	2.3	**859**	704	13	17	71	101	12.5%	267	2.6	**971**
Total	1437	67	37	107	211	12.8%	496	2.4	**1933**	1676	27	47	117	191	10.2%	486	2.5	**2162**
South Approach Volumes																		
Entering	605	48	11	35	94	13.4%	199	2.1	**804**	750	20	21	30	71	8.6%	162	2.3	**912**
Exiting	849	28	21	40	89	9.5%	204	2.3	**1053**	1056	19	23	28	70	6.2%	159	2.3	**1215**
Total	1454	76	32	75	183	11.2%	403	2.2	**1857**	1806	39	44	58	141	7.2%	321	2.3	**2127**
West Approach Volumes																		
Entering	196	17	12	19	48	19.7%	107	2.2	**303**	589	17	6	34	57	8.8%	140	2.5	**729**
Exiting	364	21	10	40	71	16.3%	172	2.4	**536**	268	18	17	28	63	19.0%	145	2.3	**413**
Total	560	38	22	59	119	17.5%	278	2.3	**838**	857	35	23	62	120	12.3%	285	2.4	**1142**
East Approach Volumes																		
Entering	313	14	18	25	57	15.4%	132	2.3	**445**	209	8	9	34	51	19.6%	132	2.6	**341**
Exiting	104	17	9	10	36	25.7%	74	2.1	**178**	492	9	9	17	35	6.6%	83	2.4	**575**
Total	417	31	27	35	93	18.2%	206	2.2	**623**	701	17	18	51	86	10.9%	215	2.5	**916**
Total Approach Volumes																		
Entering	1934	106	59	138	303	13.5%	691	2.3	**2625**	2520	59	66	144	269	9.6%	653	2.4	**3173**
Exiting	1934	106	59	138	303	13.5%	691	2.3	**2625**	2520	59	66	144	269	9.6%	653	2.4	**3173**
Total	3868	212	118	276	606	13.5%	1382	2.3	**5250**	5040	118	132	288	538	9.6%	1305	2.4	**6345**

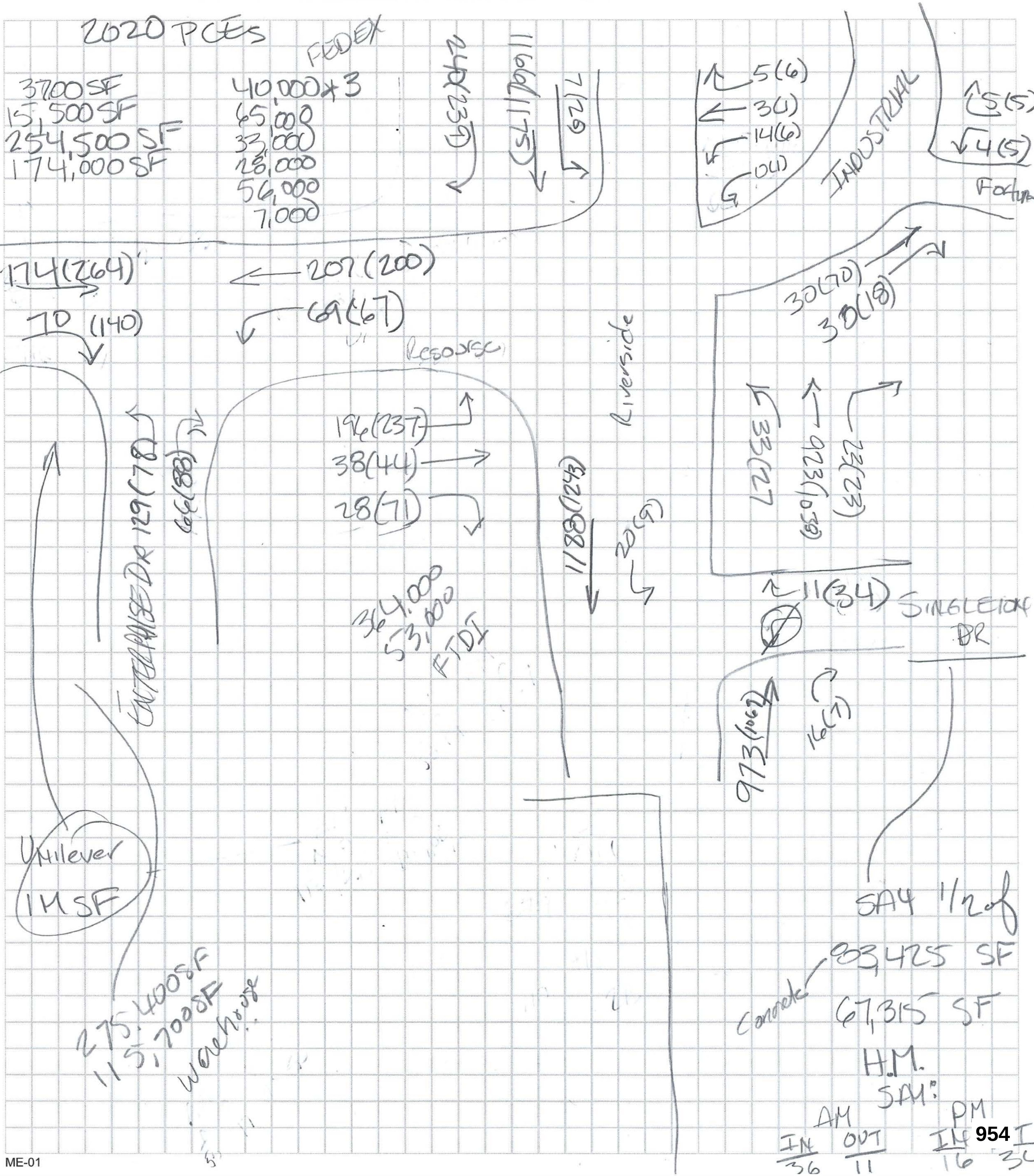

S Riverside Avenue
Industrial Drive
Resource Drive
Fortuna Way
44(35)
1112(1629)
7(20)
1166(1175)
240(239)
196(237)
38(44)
28(71)
7(9)
989(1247)
5(6)
3(1)
14(6)
G(1)
33(15)
18(12)
35(35)
0(0)
5(5)
4(5)
38(18)
30(70)
23(23)
923(1038)
33(27)

CALCULATION SHEET

PAGE _____ OF _____

CLIENT _______________ SUBJECT _______________ Prepared By ________ Date ________

PROJECT No. Use 154 _______________ Reviewed By ________ Date ________



Appendix F – Synchro Analysis Outputs

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	37	185	548	179	170	37	357	628	160	62	1148	29
Future Volume (veh/h)	37	185	548	179	170	37	357	628	160	62	1148	29
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	40	201	596	195	185	40	388	683	174	67	1248	32
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	130	819	596	258	1075	480	503	1383	347	107	1304	33
Arrive On Green	0.07	0.23	0.23	0.14	0.30	0.30	0.15	0.34	0.34	0.06	0.25	0.25
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	3456	4069	1022	1781	5120	131
Grp Volume(v), veh/h	40	201	596	195	185	40	388	570	287	67	830	450
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1728	1702	1686	1781	1702	1847
Q Serve(g_s), s	1.8	3.8	19.0	8.7	3.2	1.5	8.9	10.9	11.2	3.0	19.8	19.8
Cycle Q Clear(g_c), s	1.8	3.8	19.0	8.7	3.2	1.5	8.9	10.9	11.2	3.0	19.8	19.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.61	1.00		0.07
Lane Grp Cap(c), veh/h	130	819	596	258	1075	480	503	1157	573	107	867	470
V/C Ratio(X)	0.31	0.25	1.00	0.75	0.17	0.08	0.77	0.49	0.50	0.62	0.96	0.96
Avail Cap(c_a), veh/h	410	819	596	410	1075	480	524	1157	573	205	867	470
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.3	25.9	25.7	33.8	21.2	20.6	33.9	21.6	21.6	37.8	30.3	30.3
Incr Delay (d2), s/veh	1.3	0.2	36.9	4.5	0.1	0.1	6.7	1.5	3.1	5.8	21.8	32.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	1.5	16.6	3.9	1.2	0.5	4.0	4.3	4.6	1.4	10.2	12.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.6	26.0	62.6	38.3	21.2	20.6	40.6	23.1	24.8	43.7	52.1	62.4
LnGrp LOS	D	C	F	D	C	C	D	C	C	D	D	E
Approach Vol, veh/h		837			420			1245			1347	
Approach Delay, s/veh		52.6			29.1			28.9			55.1	
Approach LOS		D			C			C			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.5	33.0	17.0	24.0	15.5	26.0	11.0	30.0				
Change Period (Y+Rc), s	4.5	6.0	6.0	6.0	4.5	6.0	6.0	6.0				
Max Green Setting (Gmax), s	8.5	23.0	18.0	18.0	11.5	20.0	18.0	18.0				
Max Q Clear Time (g_c+I1), s	5.0	13.2	10.7	21.0	10.9	21.8	3.8	5.2				
Green Ext Time (p_c), s	0.0	3.7	0.3	0.0	0.1	0.0	0.0	0.9				
Intersection Summary												
HCM 6th Ctrl Delay			43.3									
HCM 6th LOS			D									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	546	5	375	316	920	0	0	1059	555
Future Volume (veh/h)	0	0	0	546	5	375	316	920	0	0	1059	555
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1737	1737	1737	1678	1678	0	0	1870	1870
Adj Flow Rate, veh/h				678	0	257	322	939	0	0	1081	566
Peak Hour Factor				0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %				11	11	11	15	15	0	0	2	2
Cap, veh/h				878	0	391	440	2794	0	0	2612	643
Arrive On Green				0.27	0.00	0.27	0.14	0.61	0.00	0.00	0.41	0.41
Sat Flow, veh/h				3309	0	1472	3100	4731	0	0	6696	1585
Grp Volume(v), veh/h				678	0	257	322	939	0	0	1081	566
Grp Sat Flow(s),veh/h/ln				1654	0	1472	1550	1527	0	0	1609	1585
Q Serve(g_s), s				15.2	0.0	12.5	8.0	8.1	0.0	0.0	9.6	26.5
Cycle Q Clear(g_c), s				15.2	0.0	12.5	8.0	8.1	0.0	0.0	9.6	26.5
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				878	0	391	440	2794	0	0	2612	643
V/C Ratio(X)				0.77	0.00	0.66	0.73	0.34	0.00	0.00	0.41	0.88
Avail Cap(c_a), veh/h				1277	0	568	579	2794	0	0	2612	643
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				27.3	0.0	26.3	33.0	7.7	0.0	0.0	17.0	22.0
Incr Delay (d2), s/veh				1.8	0.0	1.9	3.3	0.3	0.0	0.0	0.5	15.8
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				6.0	0.0	4.4	2.9	1.9	0.0	0.0	3.1	11.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				29.1	0.0	28.1	36.3	8.0	0.0	0.0	17.5	37.9
LnGrp LOS				C	A	C	D	A	A	A	B	D
Approach Vol, veh/h					935			1261			1647	
Approach Delay, s/veh					28.8			15.2			24.5	
Approach LOS					C			B			C	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		54.0			16.4	37.6		26.3				
Change Period (Y+Rc), s		6.0			6.0	6.0		6.0				
Max Green Setting (Gmax), s		48.0			14.0	28.0		30.0				
Max Q Clear Time (g_c+I1), s		10.1			10.0	28.5		17.2				
Green Ext Time (p_c), s		6.7			0.4	0.0		3.1				
Intersection Summary												
HCM 6th Ctrl Delay			22.5									
HCM 6th LOS			C									

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	336	8	469	0	0	0	0	897	402	399	1209	0
Future Volume (veh/h)	336	8	469	0	0	0	0	897	402	399	1209	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1693	1693	1693				0	1574	1574	1796	1796	0
Adj Flow Rate, veh/h	538	0	312				0	954	428	424	1286	0
Peak Hour Factor	0.94	0.94	0.94				0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	14	14	14				0	22	22	7	7	0
Cap, veh/h	856	0	381				0	1143	512	541	2102	0
Arrive On Green	0.27	0.00	0.27				0.00	0.39	0.39	0.16	0.62	0.00
Sat Flow, veh/h	3224	0	1434				0	3044	1302	3319	3503	0
Grp Volume(v), veh/h	538	0	312				0	942	440	424	1286	0
Grp Sat Flow(s),veh/h/ln	1612	0	1434				0	1432	1340	1659	1706	0
Q Serve(g_s), s	12.4	0.0	17.2				0.0	25.1	25.1	10.3	19.6	0.0
Cycle Q Clear(g_c), s	12.4	0.0	17.2				0.0	25.1	25.1	10.3	19.6	0.0
Prop In Lane	1.00		1.00				0.00		0.97	1.00		0.00
Lane Grp Cap(c), veh/h	856	0	381				0	1128	527	541	2102	0
V/C Ratio(X)	0.63	0.00	0.82				0.00	0.83	0.84	0.78	0.61	0.00
Avail Cap(c_a), veh/h	1069	0	476				0	1128	527	629	2102	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	27.3	0.0	29.1				0.0	23.1	23.1	33.9	10.0	0.0
Incr Delay (d2), s/veh	0.8	0.0	8.9				0.0	7.3	14.5	5.6	1.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.7	0.0	6.7				0.0	8.3	8.8	4.2	5.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.1	0.0	38.0				0.0	30.5	37.6	39.4	11.3	0.0
LnGrp LOS	C	A	D				A	C	D	D	B	A
Approach Vol, veh/h		850						1382			1710	
Approach Delay, s/veh		31.7						32.7			18.3	
Approach LOS		C						C			B	

Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	18.8	38.2		27.4		57.0						
Change Period (Y+Rc), s	6.0	6.0		6.0		6.0						
Max Green Setting (Gmax), s	15.0	30.0		27.0		51.0						
Max Q Clear Time (g_c+I1), s	12.3	27.1		19.2		21.6						
Green Ext Time (p_c), s	0.4	2.1		2.2		9.8						

Intersection Summary			
HCM 6th Ctrl Delay			26.3
HCM 6th LOS			C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	256	20	71	29	28	30	84	945	28	37	1200	429
Future Volume (veh/h)	256	20	71	29	28	30	84	945	28	37	1200	429
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1693	1693	1693	1455	1455	1455	1500	1500	1500	1722	1722	1722
Adj Flow Rate, veh/h	272	21	76	31	30	32	89	1005	30	39	1277	456
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	14	14	14	30	30	30	27	27	27	12	12	12
Cap, veh/h	324	376	319	295	307	274	95	1597	48	75	1300	448
Arrive On Green	0.22	0.22	0.22	0.22	0.22	0.22	0.07	0.57	0.57	0.05	0.54	0.54
Sat Flow, veh/h	1213	1693	1434	1010	1383	1233	1428	2825	84	1640	2388	822
Grp Volume(v), veh/h	272	21	76	31	30	32	89	507	528	39	860	873
Grp Sat Flow(s),veh/h/ln	1213	1693	1434	1010	1383	1233	1428	1425	1485	1640	1636	1574
Q Serve(g_s), s	18.1	0.9	3.9	2.2	1.6	1.9	5.6	21.6	21.6	2.1	45.4	49.0
Cycle Q Clear(g_c), s	20.0	0.9	3.9	3.1	1.6	1.9	5.6	21.6	21.6	2.1	45.4	49.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.06	1.00		0.52
Lane Grp Cap(c), veh/h	324	376	319	295	307	274	95	806	839	75	891	857
V/C Ratio(X)	0.84	0.06	0.24	0.11	0.10	0.12	0.93	0.63	0.63	0.52	0.97	1.02
Avail Cap(c_a), veh/h	324	376	319	295	307	274	95	806	839	109	891	857
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.9	27.6	28.7	28.8	27.8	27.9	41.8	13.2	13.2	42.0	19.7	20.5
Incr Delay (d2), s/veh	17.4	0.1	0.4	0.2	0.1	0.2	71.0	1.6	1.5	5.5	22.1	35.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.3	0.3	1.3	0.5	0.5	0.5	3.7	5.7	6.0	0.9	18.8	22.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.2	27.6	29.1	28.9	28.0	28.1	112.8	14.8	14.7	47.5	41.7	56.0
LnGrp LOS	D	C	C	C	C	C	F	B	B	D	D	F
Approach Vol, veh/h		369			93			1124			1772	
Approach Delay, s/veh		47.5			28.4			22.5			48.9	
Approach LOS		D			C			C			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.1	55.9		25.0	11.0	54.0		25.0
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0
Max Green Setting (Gmax), s	5.0	48.0		19.0	5.0	48.0		19.0
Max Q Clear Time (g_c+I1), s	4.1	23.6		22.0	7.6	51.0		5.1
Green Ext Time (p_c), s	0.0	6.3		0.0	0.0	0.0		0.3

Intersection Summary			
HCM 6th Ctrl Delay			39.3
HCM 6th LOS			D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	65	53	60	34	48	84	85	931	32	62	1088	127
Future Volume (veh/h)	65	53	60	34	48	84	85	931	32	62	1088	127
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1411	1411	1411	625	625	625	1574	1574	1574	1678	1678	1678
Adj Flow Rate, veh/h	71	58	65	37	52	91	92	1012	35	67	1183	138
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	33	33	33	86	86	86	22	22	22	15	15	15
Cap, veh/h	134	95	81	172	143	121	132	1470	51	104	1367	159
Arrive On Green	0.23	0.23	0.23	0.23	0.23	0.23	0.09	0.50	0.50	0.06	0.48	0.48
Sat Flow, veh/h	288	413	353	424	625	530	1499	2949	102	1598	2877	335
Grp Volume(v), veh/h	194	0	0	37	52	91	92	513	534	67	654	667
Grp Sat Flow(s),veh/h/ln	1054	0	0	424	625	530	1499	1495	1556	1598	1594	1617
Q Serve(g_s), s	7.9	0.0	0.0	0.0	5.1	11.6	4.3	18.9	18.9	3.0	26.4	26.6
Cycle Q Clear(g_c), s	12.9	0.0	0.0	8.3	5.1	11.6	4.3	18.9	18.9	3.0	26.4	26.6
Prop In Lane	0.37		0.34	1.00		1.00	1.00		0.07	1.00		0.21
Lane Grp Cap(c), veh/h	310	0	0	172	143	121	132	745	775	104	758	769
V/C Ratio(X)	0.63	0.00	0.00	0.22	0.36	0.75	0.70	0.69	0.69	0.65	0.86	0.87
Avail Cap(c_a), veh/h	442	0	0	221	216	183	249	827	861	221	838	850
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.6	0.0	0.0	24.7	23.4	25.9	32.0	13.8	13.8	33.0	16.9	16.9
Incr Delay (d2), s/veh	2.1	0.0	0.0	0.6	1.5	8.9	6.4	2.1	2.0	6.5	8.6	8.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	0.0	0.0	0.5	0.7	1.6	1.6	5.2	5.4	1.2	9.1	9.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.6	0.0	0.0	25.3	25.0	34.8	38.5	16.0	15.9	39.5	25.5	25.8
LnGrp LOS	C	A	A	C	C	C	D	B	B	D	C	C
Approach Vol, veh/h		194			180			1139			1388	
Approach Delay, s/veh		28.6			30.0			17.8			26.3	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.7	41.0		21.6	11.4	39.4		21.6				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	9.0	39.0		24.0	11.0	37.0		24.0				
Max Q Clear Time (g_c+I1), s	5.0	20.9		14.9	6.3	28.6		13.6				
Green Ext Time (p_c), s	0.0	5.7		0.7	0.1	4.7		0.7				

Intersection Summary			
HCM 6th Ctrl Delay			23.3
HCM 6th LOS			C

Intersection	
Int Delay, s/veh	0.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	35	989	7	44	1112
Future Vol, veh/h	0	35	989	7	44	1112
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	200	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	59	59	20	20	15	15
Mvmt Flow	0	38	1063	8	47	1196

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1759	536	0	0	1071	0
Stage 1	1067	-	-	-	-	-
Stage 2	692	-	-	-	-	-
Critical Hdwy	7.98	8.08	-	-	4.4	-
Critical Hdwy Stg 1	6.98	-	-	-	-	-
Critical Hdwy Stg 2	6.98	-	-	-	-	-
Follow-up Hdwy	4.09	3.89	-	-	2.35	-
Pot Cap-1 Maneuver	41	366	-	-	575	-
Stage 1	192	-	-	-	-	-
Stage 2	332	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	38	366	-	-	575	-
Mov Cap-2 Maneuver	124	-	-	-	-	-
Stage 1	192	-	-	-	-	-
Stage 2	305	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16	0	0.4
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	366	575	-
HCM Lane V/C Ratio	-	-	0.103	0.082	-
HCM Control Delay (s)	-	-	16	11.8	-
HCM Lane LOS	-	-	C	B	-
HCM 95th %tile Q(veh)	-	-	0.3	0.3	-

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	57	136	75	965	1090	42
Future Volume (veh/h)	57	136	75	965	1090	42
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	61	146	81	1038	1172	45
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	232	206	126	2713	2199	84
Arrive On Green	0.13	0.13	0.07	0.76	0.63	0.63
Sat Flow, veh/h	1781	1585	1781	3647	3583	134
Grp Volume(v), veh/h	61	146	81	1038	597	620
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1777	1777	1846
Q Serve(g_s), s	2.5	7.1	3.5	7.8	14.9	14.9
Cycle Q Clear(g_c), s	2.5	7.1	3.5	7.8	14.9	14.9
Prop In Lane	1.00	1.00	1.00			0.07
Lane Grp Cap(c), veh/h	232	206	126	2713	1120	1164
V/C Ratio(X)	0.26	0.71	0.64	0.38	0.53	0.53
Avail Cap(c_a), veh/h	457	407	201	2713	1120	1164
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.3	33.3	36.1	3.2	8.2	8.2
Incr Delay (d2), s/veh	0.6	4.4	5.4	0.4	1.8	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	6.3	1.6	1.1	4.3	4.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	31.9	37.7	41.5	3.6	10.0	10.0
LnGrp LOS	C	D	D	A	B	A
Approach Vol, veh/h	207			1119	1217	
Approach Delay, s/veh	36.0			6.3	10.0	
Approach LOS	D			A	B	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		66.0		13.9	10.6	55.4
Change Period (Y+Rc), s		6.0		4.5	6.0	6.0
Max Green Setting (Gmax), s		60.0		19.5	8.0	46.0
Max Q Clear Time (g_c+I1), s		9.8		9.1	5.5	16.9
Green Ext Time (p_c), s		7.8		0.4	0.0	8.0

Intersection Summary			
HCM 6th Ctrl Delay			10.5
HCM 6th LOS			B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	196	38	28	14	3	5	33	923	23	8	1166	240
Future Volume (veh/h)	196	38	28	14	3	5	33	923	23	8	1166	240
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1337	1337	1337	1085	1085	1085	1633	1633	1633	1633	1633	1633
Adj Flow Rate, veh/h	218	42	31	16	3	6	37	1026	26	9	1296	267
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	38	38	38	55	55	55	18	18	18	18	18	18
Cap, veh/h	306	176	130	155	27	42	59	1885	48	30	1518	309
Arrive On Green	0.25	0.25	0.25	0.25	0.25	0.25	0.04	0.61	0.61	0.02	0.59	0.59
Sat Flow, veh/h	1005	715	527	430	111	171	1555	3092	78	1555	2568	522
Grp Volume(v), veh/h	218	0	73	25	0	0	37	515	537	9	776	787
Grp Sat Flow(s),veh/h/ln	1005	0	1242	712	0	0	1555	1552	1619	1555	1552	1539
Q Serve(g_s), s	18.1	0.0	5.6	1.5	0.0	0.0	2.8	23.3	23.3	0.7	49.1	51.3
Cycle Q Clear(g_c), s	25.2	0.0	5.6	7.2	0.0	0.0	2.8	23.3	23.3	0.7	49.1	51.3
Prop In Lane	1.00		0.42	0.64		0.24	1.00		0.05	1.00		0.34
Lane Grp Cap(c), veh/h	306	0	306	224	0	0	59	946	987	30	917	910
V/C Ratio(X)	0.71	0.00	0.24	0.11	0.00	0.00	0.63	0.54	0.54	0.30	0.85	0.86
Avail Cap(c_a), veh/h	410	0	435	311	0	0	91	946	987	78	917	910
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.97	0.00	0.97	1.00	0.00	0.00	0.93	0.93	0.93	0.83	0.83	0.83
Uniform Delay (d), s/veh	43.7	0.0	36.2	36.8	0.0	0.0	56.9	13.7	13.7	58.1	20.1	20.5
Incr Delay (d2), s/veh	3.6	0.0	0.4	0.2	0.0	0.0	9.8	2.1	2.0	4.6	8.1	9.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.6	0.0	1.8	0.6	0.0	0.0	1.2	7.5	7.8	0.3	17.0	17.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.3	0.0	36.6	37.0	0.0	0.0	66.7	15.8	15.7	62.7	28.1	29.7
LnGrp LOS	D	A	D	D	A	A	E	B	B	E	C	C
Approach Vol, veh/h		291			25			1089			1572	
Approach Delay, s/veh		44.6			37.0			17.5			29.1	
Approach LOS		D			D			B			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.3	78.2		34.5	9.5	75.9		34.5				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	5.0	56.0		41.0	6.0	55.0		41.0				
Max Q Clear Time (g_c+I1), s	2.7	25.3		27.2	4.8	53.3		9.2				
Green Ext Time (p_c), s	0.0	6.7		1.3	0.0	1.3		0.1				
Intersection Summary												
HCM 6th Ctrl Delay			26.4									
HCM 6th LOS			C									

Intersection						
Int Delay, s/veh	0.2					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	11	973	16	20	1188
Future Vol, veh/h	0	11	973	16	20	1188
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	12	1081	18	22	1320

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	550	0	0	1099	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	4.14	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	0	479	-	-	631	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	479	-	-	631	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.7	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	479	631	-
HCM Lane V/C Ratio	-	-	0.026	0.035	-
HCM Control Delay (s)	-	-	12.7	10.9	-
HCM Lane LOS	-	-	B	B	-
HCM 95th %tile Q(veh)	-	-	0.1	0.1	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	139	95	75	96	279	80	126	658	36	51	897	148
Future Volume (veh/h)	139	95	75	96	279	80	126	658	36	51	897	148
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1604	1604	1604	1678	1678	1678	1693	1693	1693	1737	1737	1737
Adj Flow Rate, veh/h	148	101	80	102	297	85	134	700	38	54	954	157
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	20	20	20	15	15	15	14	14	14	11	11	11
Cap, veh/h	183	292	247	137	362	102	170	1604	87	80	1519	677
Arrive On Green	0.12	0.18	0.18	0.09	0.15	0.15	0.11	0.52	0.52	0.10	0.92	0.92
Sat Flow, veh/h	1527	1604	1359	1598	2457	691	1612	3102	168	1654	3300	1472
Grp Volume(v), veh/h	148	101	80	102	191	191	134	363	375	54	954	157
Grp Sat Flow(s),veh/h/ln	1527	1604	1359	1598	1594	1553	1612	1608	1662	1654	1650	1472
Q Serve(g_s), s	11.3	6.6	6.1	7.5	13.9	14.4	9.7	16.9	16.9	3.8	6.6	1.3
Cycle Q Clear(g_c), s	11.3	6.6	6.1	7.5	13.9	14.4	9.7	16.9	16.9	3.8	6.6	1.3
Prop In Lane	1.00		1.00	1.00		0.44	1.00		0.10	1.00		1.00
Lane Grp Cap(c), veh/h	183	292	247	137	235	229	170	832	860	80	1519	677
V/C Ratio(X)	0.81	0.35	0.32	0.75	0.81	0.83	0.79	0.44	0.44	0.67	0.63	0.23
Avail Cap(c_a), veh/h	255	307	260	213	252	246	215	832	860	124	1519	677
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.5	42.8	42.7	53.6	49.5	49.7	52.3	18.1	18.1	53.2	2.8	2.6
Incr Delay (d2), s/veh	12.4	0.7	0.7	7.9	17.0	20.2	13.9	1.7	1.6	9.3	2.0	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.9	2.6	2.1	3.2	6.5	6.7	4.4	6.0	6.2	1.7	1.4	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.8	43.5	43.4	61.5	66.5	70.0	66.3	19.7	19.7	62.5	4.8	3.4
LnGrp LOS	E	D	D	E	E	E	E	B	B	E	A	A
Approach Vol, veh/h		329			484			872			1165	
Approach Delay, s/veh		52.6			66.8			26.9			7.3	
Approach LOS		D			E			C			A	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.8	67.1	15.3	26.8	17.7	60.2	19.4	22.7
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	8.0	51.0	15.0	22.0	15.0	44.0	19.0	18.0
Max Q Clear Time (g_c+I1), s	5.8	18.9	9.5	8.6	11.7	8.6	13.3	16.4
Green Ext Time (p_c), s	0.0	4.2	0.1	0.5	0.1	7.4	0.2	0.3

Intersection Summary	
HCM 6th Ctrl Delay	28.6
HCM 6th LOS	C

Intersection						
Int Delay, s/veh	2.7					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	4	5	30	38	33	18
Future Vol, veh/h	4	5	30	38	33	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	50	50	50	50	50	50
Mvmt Flow	4	6	33	42	37	20

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	148	54	0	0	75	0
Stage 1	54	-	-	-	-	-
Stage 2	94	-	-	-	-	-
Critical Hdwy	6.9	6.7	-	-	4.6	-
Critical Hdwy Stg 1	5.9	-	-	-	-	-
Critical Hdwy Stg 2	5.9	-	-	-	-	-
Follow-up Hdwy	3.95	3.75	-	-	2.65	-
Pot Cap-1 Maneuver	744	893	-	-	1269	-
Stage 1	859	-	-	-	-	-
Stage 2	822	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	722	893	-	-	1269	-
Mov Cap-2 Maneuver	722	-	-	-	-	-
Stage 1	859	-	-	-	-	-
Stage 2	798	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.5	0	5.1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	808	1269	-
HCM Lane V/C Ratio	-	-	0.012	0.029	-
HCM Control Delay (s)	-	-	9.5	7.9	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0.1	-

Intersection	
Int Delay, s/veh	4.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	174	70	69	207	129	66
Future Vol, veh/h	174	70	69	207	129	66
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	200	-	200	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	193	78	77	230	143	73

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	271	0	616	232
Stage 1	-	-	-	-	232	-
Stage 2	-	-	-	-	384	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1292	-	454	807
Stage 1	-	-	-	-	807	-
Stage 2	-	-	-	-	688	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1292	-	427	807
Mov Cap-2 Maneuver	-	-	-	-	517	-
Stage 1	-	-	-	-	807	-
Stage 2	-	-	-	-	647	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2	13
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	517	807	-	-	1292	-
HCM Lane V/C Ratio	0.277	0.091	-	-	0.059	-
HCM Control Delay (s)	14.6	9.9	-	-	8	-
HCM Lane LOS	B	A	-	-	A	-
HCM 95th %tile Q(veh)	1.1	0.3	-	-	0.2	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	94	253	476	186	294	126	567	1259	196	82	786	59
Future Volume (veh/h)	94	253	476	186	294	126	567	1259	196	82	786	59
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	97	261	491	192	303	130	585	1298	202	85	810	61
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	165	686	568	259	874	390	572	1487	231	131	1171	88
Arrive On Green	0.09	0.19	0.19	0.15	0.25	0.25	0.17	0.33	0.33	0.07	0.24	0.24
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	3456	4456	693	1781	4846	363
Grp Volume(v), veh/h	97	261	491	192	303	130	585	992	508	85	568	303
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1728	1702	1746	1781	1702	1805
Q Serve(g_s), s	4.1	5.0	10.3	8.1	5.5	5.3	13.0	21.5	21.5	3.6	11.9	12.0
Cycle Q Clear(g_c), s	4.1	5.0	10.3	8.1	5.5	5.3	13.0	21.5	21.5	3.6	11.9	12.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.40	1.00		0.20
Lane Grp Cap(c), veh/h	165	686	568	259	874	390	572	1136	583	131	823	436
V/C Ratio(X)	0.59	0.38	0.86	0.74	0.35	0.33	1.02	0.87	0.87	0.65	0.69	0.69
Avail Cap(c_a), veh/h	431	859	645	431	874	390	572	1136	583	136	823	436
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.2	27.6	7.1	32.2	24.4	24.3	32.8	24.6	24.6	35.4	27.1	27.2
Incr Delay (d2), s/veh	3.3	0.3	10.7	4.2	0.2	0.5	43.8	9.3	16.5	9.9	4.7	8.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	2.1	4.2	3.7	2.3	2.0	8.7	9.6	11.0	1.9	5.2	6.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.6	28.0	17.8	36.3	24.7	24.8	76.6	34.0	41.1	45.4	31.8	36.0
LnGrp LOS	D	C	B	D	C	C	F	C	D	D	C	D
Approach Vol, veh/h		849			625			2085			956	
Approach Delay, s/veh		23.2			28.3			47.6			34.4	
Approach LOS		C			C			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.8	31.2	16.4	20.2	18.0	24.0	12.3	24.3
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	5.0	25.0	18.0	18.0	12.0	18.0	18.0	18.0
Max Q Clear Time (g_c+I1), s	5.6	23.5	10.1	12.3	15.0	14.0	6.1	7.5
Green Ext Time (p_c), s	0.0	1.2	0.3	1.9	0.0	2.0	0.2	1.7

Intersection Summary	
HCM 6th Ctrl Delay	37.6
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	625	3	501	313	1579	0	0	1150	402
Future Volume (veh/h)	0	0	0	625	3	501	313	1579	0	0	1150	402
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1752	1752	1752	1841	1841	0	0	1856	1856
Adj Flow Rate, veh/h				815	0	349	326	1645	0	0	1198	419
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %				10	10	10	4	4	0	0	3	3
Cap, veh/h				1056	0	470	461	2786	0	0	2263	557
Arrive On Green				0.32	0.00	0.32	0.14	0.55	0.00	0.00	0.35	0.35
Sat Flow, veh/h				3337	0	1485	3401	5191	0	0	6643	1572
Grp Volume(v), veh/h				815	0	349	326	1645	0	0	1198	419
Grp Sat Flow(s),veh/h/ln				1668	0	1485	1700	1675	0	0	1596	1572
Q Serve(g_s), s				17.1	0.0	16.3	7.1	16.8	0.0	0.0	11.6	18.2
Cycle Q Clear(g_c), s				17.1	0.0	16.3	7.1	16.8	0.0	0.0	11.6	18.2
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				1056	0	470	461	2786	0	0	2263	557
V/C Ratio(X)				0.77	0.00	0.74	0.71	0.59	0.00	0.00	0.53	0.75
Avail Cap(c_a), veh/h				1592	0	708	614	2786	0	0	2263	557
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				24.0	0.0	23.7	32.1	11.4	0.0	0.0	19.9	22.0
Incr Delay (d2), s/veh				1.3	0.0	2.3	2.5	0.9	0.0	0.0	0.9	9.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				6.6	0.0	5.7	2.8	4.8	0.0	0.0	3.8	7.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				25.3	0.0	26.0	34.5	12.4	0.0	0.0	20.8	31.1
LnGrp LOS				C	A	C	C	B	A	A	C	C
Approach Vol, veh/h					1164			1971			1617	
Approach Delay, s/veh					25.5			16.0			23.4	
Approach LOS					C			B			C	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		48.0			15.5	32.5		29.5				
Change Period (Y+Rc), s		6.0			6.0	6.0		6.0				
Max Green Setting (Gmax), s		42.0			13.0	23.0		36.0				
Max Q Clear Time (g_c+I1), s		18.8			9.1	20.2		19.1				
Green Ext Time (p_c), s		11.7			0.4	2.1		4.4				
Intersection Summary												
HCM 6th Ctrl Delay			20.9									
HCM 6th LOS			C									

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	594	0	445	0	0	0	0	1321	620	462	1337	0
Future Volume (veh/h)	594	0	445	0	0	0	0	1321	620	462	1337	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1767	1767	1767				0	1781	1781	1796	1796	0
Adj Flow Rate, veh/h	755	0	306				0	1362	639	476	1378	0
Peak Hour Factor	0.97	0.97	0.97				0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	9	9	9				0	8	8	7	7	0
Cap, veh/h	823	0	366				0	1412	649	516	2199	0
Arrive On Green	0.24	0.00	0.24				0.00	0.43	0.43	0.16	0.64	0.00
Sat Flow, veh/h	3365	0	1497				0	3418	1497	3319	3503	0
Grp Volume(v), veh/h	755	0	306				0	1355	646	476	1378	0
Grp Sat Flow(s),veh/h/ln	1682	0	1497				0	1621	1512	1659	1706	0
Q Serve(g_s), s	19.7	0.0	17.5				0.0	36.6	38.0	12.7	21.7	0.0
Cycle Q Clear(g_c), s	19.7	0.0	17.5				0.0	36.6	38.0	12.7	21.7	0.0
Prop In Lane	1.00		1.00				0.00		0.99	1.00		0.00
Lane Grp Cap(c), veh/h	823	0	366				0	1405	655	516	2199	0
V/C Ratio(X)	0.92	0.00	0.84				0.00	0.96	0.99	0.92	0.63	0.00
Avail Cap(c_a), veh/h	823	0	366				0	1405	655	516	2199	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	33.1	0.0	32.3				0.0	24.8	25.2	37.5	9.5	0.0
Incr Delay (d2), s/veh	15.1	0.0	15.4				0.0	17.0	31.7	22.2	1.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.5	0.0	7.7				0.0	15.1	17.2	6.3	6.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.2	0.0	47.7				0.0	41.8	57.0	59.6	10.9	0.0
LnGrp LOS	D	A	D				A	D	E	E	B	A
Approach Vol, veh/h		1061						2001			1854	
Approach Delay, s/veh		48.1						46.7			23.4	
Approach LOS		D						D			C	

Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	19.0	44.0		27.0		63.0						
Change Period (Y+Rc), s	6.0	6.0		6.0		6.0						
Max Green Setting (Gmax), s	13.0	38.0		21.0		57.0						
Max Q Clear Time (g_c+I1), s	14.7	40.0		21.7		23.7						
Green Ext Time (p_c), s	0.0	0.0		0.0		11.3						

Intersection Summary			
HCM 6th Ctrl Delay			38.2
HCM 6th LOS			D

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	414	119	149	33	30	73	35	1394	22	27	1465	286
Future Volume (veh/h)	414	119	149	33	30	73	35	1394	22	27	1465	286
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1411	1411	1411	1767	1767	1767	1707	1707	1707
Adj Flow Rate, veh/h	440	127	159	35	32	78	37	1483	23	29	1559	304
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	7	7	7	33	33	33	9	9	9	13	13	13
Cap, veh/h	385	531	450	281	396	353	76	1670	26	65	1330	252
Arrive On Green	0.30	0.30	0.30	0.30	0.30	0.30	0.05	0.49	0.49	0.04	0.49	0.49
Sat Flow, veh/h	1232	1796	1522	825	1340	1196	1682	3383	52	1626	2720	516
Grp Volume(v), veh/h	440	127	159	35	32	78	37	735	771	29	912	951
Grp Sat Flow(s),veh/h/ln	1232	1796	1522	825	1340	1196	1682	1678	1757	1626	1622	1614
Q Serve(g_s), s	21.7	4.7	7.2	3.0	1.5	4.3	1.9	34.7	34.8	1.5	43.0	43.0
Cycle Q Clear(g_c), s	26.0	4.7	7.2	7.7	1.5	4.3	1.9	34.7	34.8	1.5	43.0	43.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.03	1.00		0.32
Lane Grp Cap(c), veh/h	385	531	450	281	396	353	76	829	868	65	793	789
V/C Ratio(X)	1.14	0.24	0.35	0.12	0.08	0.22	0.49	0.89	0.89	0.44	1.15	1.21
Avail Cap(c_a), veh/h	385	531	450	281	396	353	115	829	868	111	793	789
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.5	23.5	24.4	26.4	22.4	23.4	41.0	20.1	20.1	41.3	22.5	22.5
Incr Delay (d2), s/veh	90.2	0.2	0.5	0.2	0.1	0.3	4.8	11.5	11.2	4.7	82.0	104.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	17.7	1.9	2.5	0.6	0.5	1.2	0.8	13.6	14.2	0.7	31.2	35.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	125.7	23.7	24.8	26.6	22.4	23.7	45.8	31.5	31.3	45.9	104.5	126.7
LnGrp LOS	F	C	C	C	C	C	D	C	C	D	F	F
Approach Vol, veh/h		726			145			1543			1892	
Approach Delay, s/veh		85.8			24.1			31.7			114.8	
Approach LOS		F			C			C			F	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.5	48.4		31.0	9.0	48.0		31.0				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	5.0	42.0		25.0	5.0	42.0		25.0				
Max Q Clear Time (g_c+I1), s	3.5	36.8		28.0	3.9	45.0		9.7				
Green Ext Time (p_c), s	0.0	3.6		0.0	0.0	0.0		0.6				
Intersection Summary												
HCM 6th Ctrl Delay			77.1									
HCM 6th LOS			E									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	107	15	94	38	19	65	85	1251	19	55	1506	78
Future Volume (veh/h)	107	15	94	38	19	65	85	1251	19	55	1506	78
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1707	1707	1707	1633	1633	1633	1752	1752	1752	1707	1707	1707
Adj Flow Rate, veh/h	115	16	101	41	20	70	91	1345	20	59	1619	84
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	13	13	13	18	18	18	10	10	10	13	13	13
Cap, veh/h	192	32	122	282	342	290	134	1845	27	93	1653	85
Arrive On Green	0.21	0.21	0.21	0.21	0.21	0.21	0.08	0.55	0.55	0.06	0.53	0.53
Sat Flow, veh/h	604	154	584	1113	1633	1384	1668	3357	50	1626	3138	162
Grp Volume(v), veh/h	232	0	0	41	20	70	91	666	699	59	833	870
Grp Sat Flow(s),veh/h/ln	1342	0	0	1113	1633	1384	1668	1664	1743	1626	1622	1678
Q Serve(g_s), s	12.1	0.0	0.0	0.0	0.8	3.4	4.3	24.6	24.6	2.9	40.8	41.6
Cycle Q Clear(g_c), s	13.4	0.0	0.0	3.2	0.8	3.4	4.3	24.6	24.6	2.9	40.8	41.6
Prop In Lane	0.50		0.44	1.00		1.00	1.00		0.03	1.00		0.10
Lane Grp Cap(c), veh/h	347	0	0	282	342	290	134	915	958	93	854	884
V/C Ratio(X)	0.67	0.00	0.00	0.15	0.06	0.24	0.68	0.73	0.73	0.63	0.97	0.98
Avail Cap(c_a), veh/h	443	0	0	363	460	390	184	915	958	159	854	884
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.7	0.0	0.0	26.8	25.8	26.9	36.5	13.8	13.8	37.6	18.8	19.0
Incr Delay (d2), s/veh	2.6	0.0	0.0	0.2	0.1	0.4	5.9	3.0	2.8	6.9	24.7	26.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.3	0.0	0.0	0.6	0.3	1.1	1.8	7.6	8.0	1.2	17.4	18.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.3	0.0	0.0	27.0	25.9	27.3	42.4	16.8	16.7	44.5	43.4	45.3
LnGrp LOS	C	A	A	C	C	C	D	B	B	D	D	D
Approach Vol, veh/h		232			131			1456			1762	
Approach Delay, s/veh		33.3			27.0			18.3			44.4	
Approach LOS		C			C			B			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.7	49.9		22.1	11.5	48.0		22.1				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	7.0	43.0		22.0	8.0	42.0		22.0				
Max Q Clear Time (g_c+I1), s	4.9	26.6		15.4	6.3	43.6		5.4				
Green Ext Time (p_c), s	0.0	7.5		0.7	0.0	0.0		0.4				

Intersection Summary			
HCM 6th Ctrl Delay			32.4
HCM 6th LOS			C

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	3	35	1247	9	36	1629
Future Vol, veh/h	3	35	1247	9	36	1629
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	200	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	32	32	9	9	12	12
Mvmt Flow	3	38	1355	10	39	1771

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2324	683	0	0	1365	0
Stage 1	1360	-	-	-	-	-
Stage 2	964	-	-	-	-	-
Critical Hdwy	7.44	7.54	-	-	4.34	-
Critical Hdwy Stg 1	6.44	-	-	-	-	-
Critical Hdwy Stg 2	6.44	-	-	-	-	-
Follow-up Hdwy	3.82	3.62	-	-	2.32	-
Pot Cap-1 Maneuver	21	329	-	-	450	-
Stage 1	156	-	-	-	-	-
Stage 2	268	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	19	329	-	-	450	-
Mov Cap-2 Maneuver	95	-	-	-	-	-
Stage 1	156	-	-	-	-	-
Stage 2	245	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	20.4	0	0.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	275	450	-
HCM Lane V/C Ratio	-	-	0.15	0.087	-
HCM Control Delay (s)	-	-	20.4	13.8	-
HCM Lane LOS	-	-	C	B	-
HCM 95th %tile Q(veh)	-	-	0.5	0.3	-

Movement	EBL	EBR	NBU	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (veh/h)	30	155	2	98	1210	1573	53
Future Volume (veh/h)	30	155	2	98	1210	1573	53
Initial Q (Qb), veh	0	0		0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00			1.00
Parking Bus, Adj	1.00	1.00		1.00	1.00	1.00	1.00
Work Zone On Approach	No				No	No	
Adj Sat Flow, veh/h/ln	1870	1870		1870	1870	1870	1870
Adj Flow Rate, veh/h	33	170		108	1330	1729	58
Peak Hour Factor	0.91	0.91		0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2		2	2	2	2
Cap, veh/h	252	225		157	2629	2079	69
Arrive On Green	0.14	0.14		0.09	0.74	0.59	0.59
Sat Flow, veh/h	1781	1585		1781	3647	3602	117
Grp Volume(v), veh/h	33	170		108	1330	872	915
Grp Sat Flow(s),veh/h/ln	1781	1585		1781	1777	1777	1849
Q Serve(g_s), s	1.4	8.7		5.0	13.1	33.1	33.6
Cycle Q Clear(g_c), s	1.4	8.7		5.0	13.1	33.1	33.6
Prop In Lane	1.00	1.00		1.00			0.06
Lane Grp Cap(c), veh/h	252	225		157	2629	1053	1096
V/C Ratio(X)	0.13	0.76		0.69	0.51	0.83	0.83
Avail Cap(c_a), veh/h	401	357		160	2629	1053	1096
HCM Platoon Ratio	1.00	1.00		1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00		1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.7	34.8		37.4	4.6	13.7	13.9
Incr Delay (d2), s/veh	0.2	5.2		11.5	0.7	7.5	7.5
Initial Q Delay(d3),s/veh	0.0	0.0		0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	7.7		2.6	3.7	13.6	14.3
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	31.9	40.0		48.9	5.3	21.3	21.4
LnGrp LOS	C	D		D	A	C	C
Approach Vol, veh/h	203				1438	1787	
Approach Delay, s/veh	38.6				8.5	21.3	
Approach LOS	D				A	C	

Timer - Assigned Phs		2		4	5	6	
Phs Duration (G+Y+Rc), s		67.4		17.0	12.4	55.0	
Change Period (Y+Rc), s		6.0		6.0	6.0	6.0	
Max Green Setting (Gmax), s		61.4		18.0	6.6	48.8	
Max Q Clear Time (g_c+I1), s		15.1		10.7	7.0	35.6	
Green Ext Time (p_c), s		14.5		0.3	0.0	9.9	

Intersection Summary			
HCM 6th Ctrl Delay			17.0
HCM 6th LOS			B

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	243	44	71	7	1	6	27	1038	23	21	1175	239
Future Volume (veh/h)	243	44	71	7	1	6	27	1038	23	21	1175	239
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1648	1648	1648	1826	1826	1826	1737	1737	1737	1678	1678	1678
Adj Flow Rate, veh/h	270	49	79	8	1	7	30	1153	26	23	1306	266
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	17	17	17	5	5	5	11	11	11	15	15	15
Cap, veh/h	388	149	240	187	36	131	63	1829	41	54	1453	292
Arrive On Green	0.26	0.26	0.26	0.26	0.26	0.26	0.04	0.55	0.55	0.03	0.55	0.55
Sat Flow, veh/h	1240	568	915	508	136	501	1654	3299	74	1598	2644	532
Grp Volume(v), veh/h	270	0	128	16	0	0	30	577	602	23	780	792
Grp Sat Flow(s),veh/h/ln	1240	0	1483	1145	0	0	1654	1650	1724	1598	1594	1582
Q Serve(g_s), s	14.5	0.0	7.0	0.1	0.0	0.0	1.8	24.0	24.0	1.4	43.2	45.2
Cycle Q Clear(g_c), s	21.5	0.0	7.0	7.0	0.0	0.0	1.8	24.0	24.0	1.4	43.2	45.2
Prop In Lane	1.00		0.62	0.50		0.44	1.00		0.04	1.00		0.34
Lane Grp Cap(c), veh/h	388	0	389	354	0	0	63	915	955	54	876	869
V/C Ratio(X)	0.70	0.00	0.33	0.05	0.00	0.00	0.47	0.63	0.63	0.43	0.89	0.91
Avail Cap(c_a), veh/h	608	0	652	600	0	0	99	915	955	96	876	869
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.4	0.0	29.8	27.6	0.0	0.0	47.1	15.3	15.3	47.4	19.9	20.3
Incr Delay (d2), s/veh	2.3	0.0	0.5	0.1	0.0	0.0	5.4	3.3	3.2	5.3	13.2	15.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.5	0.0	2.6	0.3	0.0	0.0	0.8	8.3	8.6	0.6	16.2	17.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.7	0.0	30.3	27.7	0.0	0.0	52.6	18.6	18.4	52.7	33.1	35.6
LnGrp LOS	D	A	C	C	A	A	D	B	B	D	C	D
Approach Vol, veh/h		398			16			1209			1595	
Approach Delay, s/veh		35.3			27.7			19.4			34.6	
Approach LOS		D			C			B			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.4	60.5		31.2	8.8	60.0		31.2				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	5.0	54.0		43.0	5.0	54.0		43.0				
Max Q Clear Time (g_c+I1), s	3.4	26.0		23.5	3.8	47.2		9.0				
Green Ext Time (p_c), s	0.0	7.6		1.8	0.0	4.8		0.1				

Intersection Summary			
HCM 6th Ctrl Delay			28.9
HCM 6th LOS			C

Intersection						
Int Delay, s/veh	0.3					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	34	1069	7	9	1243
Future Vol, veh/h	0	34	1069	7	9	1243
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	38	1188	8	10	1381

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	598	0	0	1196	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	4.14	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	0	445	-	-	579	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	445	-	-	579	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.8	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	445	579	-
HCM Lane V/C Ratio	-	-	0.085	0.017	-
HCM Control Delay (s)	-	-	13.8	11.3	-
HCM Lane LOS	-	-	B	B	-
HCM 95th %tile Q(veh)	-	-	0.3	0.1	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	159	407	177	73	168	107	127	725	79	101	976	138
Future Volume (veh/h)	159	407	177	73	168	107	127	725	79	101	976	138
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1767	1767	1767	1604	1604	1604	1767	1767	1767	1781	1781	1781
Adj Flow Rate, veh/h	169	433	188	78	179	114	135	771	84	107	1038	147
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	9	9	9	20	20	20	9	9	9	8	8	8
Cap, veh/h	211	485	411	108	401	242	174	1204	131	145	1274	568
Arrive On Green	0.13	0.27	0.27	0.07	0.22	0.22	0.10	0.39	0.39	0.09	0.38	0.38
Sat Flow, veh/h	1682	1767	1497	1527	1825	1104	1682	3053	332	1697	3385	1510
Grp Volume(v), veh/h	169	433	188	78	148	145	135	424	431	107	1038	147
Grp Sat Flow(s),veh/h/ln	1682	1767	1497	1527	1523	1405	1682	1678	1707	1697	1692	1510
Q Serve(g_s), s	11.2	26.9	11.9	5.7	9.6	10.3	8.9	23.4	23.4	7.0	31.5	7.7
Cycle Q Clear(g_c), s	11.2	26.9	11.9	5.7	9.6	10.3	8.9	23.4	23.4	7.0	31.5	7.7
Prop In Lane	1.00		1.00	1.00		0.79	1.00		0.19	1.00		1.00
Lane Grp Cap(c), veh/h	211	485	411	108	335	309	174	662	673	145	1274	568
V/C Ratio(X)	0.80	0.89	0.46	0.72	0.44	0.47	0.78	0.64	0.64	0.74	0.81	0.26
Avail Cap(c_a), veh/h	309	541	459	120	335	309	191	662	673	178	1274	568
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.6	39.8	34.4	52.0	38.5	38.8	49.9	28.0	28.0	51.0	32.0	24.6
Incr Delay (d2), s/veh	9.0	16.0	0.8	17.2	0.9	1.1	16.5	4.7	4.6	11.8	5.8	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.1	13.3	4.3	2.6	3.6	3.5	4.4	9.5	9.6	3.3	12.8	2.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.6	55.8	35.2	69.2	39.4	39.9	66.5	32.7	32.7	62.8	37.8	25.7
LnGrp LOS	E	E	D	E	D	D	E	C	C	E	D	C
Approach Vol, veh/h		790			371			990			1292	
Approach Delay, s/veh		51.3			45.9			37.3			38.5	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.8	50.0	13.1	36.4	16.8	48.0	19.3	30.1
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	11.0	43.0	8.0	34.0	12.0	42.0	20.0	22.0
Max Q Clear Time (g_c+I1), s	9.0	25.4	7.7	28.9	10.9	33.5	13.2	12.3
Green Ext Time (p_c), s	0.0	4.4	0.0	1.4	0.0	4.3	0.2	1.0

Intersection Summary	
HCM 6th Ctrl Delay	41.9
HCM 6th LOS	D

Intersection	
Int Delay, s/veh	1.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	5	70	18	15	12
Future Vol, veh/h	5	5	70	18	15	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	50	50	50	50	50	50
Mvmt Flow	6	6	78	20	17	13

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	135	88	0	0	98	0
Stage 1	88	-	-	-	-	-
Stage 2	47	-	-	-	-	-
Critical Hdwy	6.9	6.7	-	-	4.6	-
Critical Hdwy Stg 1	5.9	-	-	-	-	-
Critical Hdwy Stg 2	5.9	-	-	-	-	-
Follow-up Hdwy	3.95	3.75	-	-	2.65	-
Pot Cap-1 Maneuver	757	853	-	-	1242	-
Stage 1	828	-	-	-	-	-
Stage 2	866	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	746	853	-	-	1242	-
Mov Cap-2 Maneuver	746	-	-	-	-	-
Stage 1	828	-	-	-	-	-
Stage 2	854	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.6	0	4.4
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	796	1242	-
HCM Lane V/C Ratio	-	-	0.014	0.013	-
HCM Control Delay (s)	-	-	9.6	7.9	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	3.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	264	140	67	200	78	88
Future Vol, veh/h	264	140	67	200	78	88
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	200	-	200	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	293	156	74	222	87	98

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	449	0	741	371
Stage 1	-	-	-	-	371	-
Stage 2	-	-	-	-	370	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1111	-	384	675
Stage 1	-	-	-	-	698	-
Stage 2	-	-	-	-	699	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1111	-	358	675
Mov Cap-2 Maneuver	-	-	-	-	471	-
Stage 1	-	-	-	-	698	-
Stage 2	-	-	-	-	652	-

Approach	EB		WB		NB
HCM Control Delay, s	0		2.1		12.7
HCM LOS					B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	471	675	-	-	1111	-
HCM Lane V/C Ratio	0.184	0.145	-	-	0.067	-
HCM Control Delay (s)	14.4	11.2	-	-	8.5	-
HCM Lane LOS	B	B	-	-	A	-
HCM 95th %tile Q(veh)	0.7	0.5	-	-	0.2	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	192	570	186	177	38	371	653	166	65	1194	30
Future Volume (veh/h)	38	192	570	186	177	38	371	653	166	65	1194	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	38	192	570	186	177	38	371	653	166	65	1194	30
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	81	766	564	238	1079	481	486	1491	373	103	1452	36
Arrive On Green	0.05	0.22	0.22	0.13	0.30	0.30	0.14	0.37	0.37	0.06	0.28	0.28
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	3456	4072	1019	1781	5123	129
Grp Volume(v), veh/h	38	192	570	186	177	38	371	544	275	65	793	431
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1728	1702	1687	1781	1702	1847
Q Serve(g_s), s	1.8	4.0	19.0	8.9	3.2	1.5	9.1	10.6	10.9	3.1	19.2	19.2
Cycle Q Clear(g_c), s	1.8	4.0	19.0	8.9	3.2	1.5	9.1	10.6	10.9	3.1	19.2	19.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.60	1.00		0.07
Lane Grp Cap(c), veh/h	81	766	564	238	1079	481	486	1246	617	103	965	524
V/C Ratio(X)	0.47	0.25	1.01	0.78	0.16	0.08	0.76	0.44	0.45	0.63	0.82	0.82
Avail Cap(c_a), veh/h	121	766	564	242	1079	481	549	1246	617	162	965	524
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.0	28.7	28.4	36.9	22.5	21.9	36.5	21.1	21.2	40.6	29.5	29.5
Incr Delay (d2), s/veh	4.1	0.2	40.4	14.8	0.1	0.1	5.6	1.1	2.3	6.2	7.9	13.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	1.7	17.6	4.8	1.3	0.6	4.2	4.3	4.6	1.5	8.6	10.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.2	28.9	68.8	51.8	22.6	22.0	42.1	22.2	23.5	46.8	37.4	43.1
LnGrp LOS	D	C	F	D	C	C	D	C	C	D	D	D
Approach Vol, veh/h		800			401			1190			1289	
Approach Delay, s/veh		58.1			36.1			28.7			39.8	
Approach LOS		E			D			C			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.1	37.3	16.8	24.0	17.4	30.0	9.0	31.8				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	7.0	30.0	11.0	18.0	13.0	24.0	5.0	24.0				
Max Q Clear Time (g_c+I1), s	5.1	12.9	10.9	21.0	11.1	21.2	3.8	5.2				
Green Ext Time (p_c), s	0.0	5.2	0.0	0.0	0.3	1.9	0.0	1.1				
Intersection Summary												
HCM 6th Ctrl Delay			39.8									
HCM 6th LOS			D									

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	568	5	390	329	957	0	0	1102	577
Future Volume (veh/h)	0	0	0	568	5	390	329	957	0	0	1102	577
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1737	1737	1737	1678	1678	0	0	1870	1870
Adj Flow Rate, veh/h				691	0	262	329	957	0	0	1102	577
Peak Hour Factor				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %				11	11	11	15	15	0	0	2	2
Cap, veh/h				890	0	396	449	2781	0	0	2576	635
Arrive On Green				0.27	0.00	0.27	0.14	0.61	0.00	0.00	0.40	0.40
Sat Flow, veh/h				3309	0	1472	3100	4731	0	0	6696	1585
Grp Volume(v), veh/h				691	0	262	329	957	0	0	1102	577
Grp Sat Flow(s),veh/h/ln				1654	0	1472	1550	1527	0	0	1609	1585
Q Serve(g_s), s				15.6	0.0	12.8	8.2	8.4	0.0	0.0	10.0	27.7
Cycle Q Clear(g_c), s				15.6	0.0	12.8	8.2	8.4	0.0	0.0	10.0	27.7
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				890	0	396	449	2781	0	0	2576	635
V/C Ratio(X)				0.78	0.00	0.66	0.73	0.34	0.00	0.00	0.43	0.91
Avail Cap(c_a), veh/h				1271	0	565	615	2781	0	0	2576	635
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				27.3	0.0	26.2	33.0	7.9	0.0	0.0	17.5	22.8
Incr Delay (d2), s/veh				2.0	0.0	1.9	2.9	0.3	0.0	0.0	0.5	19.3
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				6.1	0.0	4.5	3.0	2.0	0.0	0.0	3.2	11.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				29.2	0.0	28.1	35.9	8.2	0.0	0.0	18.0	42.1
LnGrp LOS				C	A	C	D	A	A	A	B	D
Approach Vol, veh/h					953			1286			1679	
Approach Delay, s/veh					28.9			15.3			26.3	
Approach LOS					C			B			C	

Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		54.0			16.7	37.3		26.7				
Change Period (Y+Rc), s		6.0			6.0	6.0		6.0				
Max Green Setting (Gmax), s		48.0			15.0	27.0		30.0				
Max Q Clear Time (g_c+I1), s		10.4			10.2	29.7		17.6				
Green Ext Time (p_c), s		6.8			0.5	0.0		3.1				

Intersection Summary			
HCM 6th Ctrl Delay			23.3
HCM 6th LOS			C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	350	8	488	0	0	0	0	933	418	415	1258	0
Future Volume (veh/h)	350	8	488	0	0	0	0	933	418	415	1258	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1693	1693	1693				0	1574	1574	1796	1796	0
Adj Flow Rate, veh/h	527	0	305				0	933	418	415	1258	0
Peak Hour Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	14	14	14				0	22	22	7	7	0
Cap, veh/h	805	0	358				0	1223	548	527	2173	0
Arrive On Green	0.25	0.00	0.25				0.00	0.42	0.42	0.16	0.64	0.00
Sat Flow, veh/h	3224	0	1434				0	3046	1300	3319	3503	0
Grp Volume(v), veh/h	527	0	305				0	920	431	415	1258	0
Grp Sat Flow(s),veh/h/ln	1612	0	1434				0	1432	1340	1659	1706	0
Q Serve(g_s), s	12.9	0.0	17.8				0.0	24.1	24.1	10.6	18.7	0.0
Cycle Q Clear(g_c), s	12.9	0.0	17.8				0.0	24.1	24.1	10.6	18.7	0.0
Prop In Lane	1.00		1.00				0.00		0.97	1.00		0.00
Lane Grp Cap(c), veh/h	805	0	358				0	1207	564	527	2173	0
V/C Ratio(X)	0.65	0.00	0.85				0.00	0.76	0.76	0.79	0.58	0.00
Avail Cap(c_a), veh/h	880	0	391				0	1207	564	604	2173	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	29.6	0.0	31.5				0.0	21.7	21.7	35.6	9.2	0.0
Incr Delay (d2), s/veh	1.6	0.0	15.4				0.0	4.6	9.4	6.1	1.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.0	0.0	7.5				0.0	7.6	7.9	4.4	5.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.2	0.0	46.8				0.0	26.3	31.2	41.7	10.3	0.0
LnGrp LOS	C	A	D				A	C	C	D	B	A
Approach Vol, veh/h		832						1351			1673	
Approach Delay, s/veh		36.9						27.9			18.1	
Approach LOS		D						C			B	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	19.0	42.0		27.0		61.0
Change Period (Y+Rc), s	6.0	6.0		6.0		6.0
Max Green Setting (Gmax), s	15.0	34.0		23.0		55.0
Max Q Clear Time (g_c+I1), s	12.6	26.1		19.8		20.7
Green Ext Time (p_c), s	0.4	4.7		1.1		9.9

Intersection Summary		
HCM 6th Ctrl Delay		25.6
HCM 6th LOS		C

Notes
User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	266	21	74	30	29	31	87	983	29	38	1248	446
Future Volume (veh/h)	266	21	74	30	29	31	87	983	29	38	1248	446
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1693	1693	1693	1455	1455	1455	1500	1500	1500	1722	1722	1722
Adj Flow Rate, veh/h	266	21	74	30	29	31	87	983	29	38	1248	446
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	14	14	14	30	30	30	27	27	27	12	12	12
Cap, veh/h	339	395	335	306	323	288	95	1568	46	74	1272	440
Arrive On Green	0.23	0.23	0.23	0.23	0.23	0.23	0.07	0.55	0.55	0.05	0.53	0.53
Sat Flow, veh/h	1215	1693	1434	1012	1383	1233	1428	2826	83	1640	2385	825
Grp Volume(v), veh/h	266	21	74	30	29	31	87	496	516	38	843	851
Grp Sat Flow(s),veh/h/ln	1215	1693	1434	1012	1383	1233	1428	1425	1485	1640	1636	1574
Q Serve(g_s), s	19.2	0.9	3.8	2.1	1.5	1.8	5.4	21.4	21.4	2.0	44.6	48.0
Cycle Q Clear(g_c), s	21.0	0.9	3.8	3.0	1.5	1.8	5.4	21.4	21.4	2.0	44.6	48.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.06	1.00		0.52
Lane Grp Cap(c), veh/h	339	395	335	306	323	288	95	791	824	74	873	839
V/C Ratio(X)	0.78	0.05	0.22	0.10	0.09	0.11	0.91	0.63	0.63	0.51	0.97	1.01
Avail Cap(c_a), veh/h	339	395	335	306	323	288	95	791	824	109	873	839
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.6	26.8	27.9	27.9	27.0	27.1	41.7	13.7	13.7	42.0	20.2	21.0
Incr Delay (d2), s/veh	11.4	0.1	0.3	0.1	0.1	0.2	64.8	1.6	1.5	5.4	22.5	34.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.6	0.3	1.2	0.5	0.5	0.5	3.5	5.8	6.0	0.9	18.8	21.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.0	26.8	28.2	28.1	27.1	27.3	106.5	15.2	15.2	47.4	42.7	55.6
LnGrp LOS	D	C	C	C	C	C	F	B	B	D	D	F
Approach Vol, veh/h		361			90			1099			1732	
Approach Delay, s/veh		42.0			27.5			22.4			49.1	
Approach LOS		D			C			C			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.1	54.9		26.0	11.0	53.0		26.0				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	5.0	47.0		20.0	5.0	47.0		20.0				
Max Q Clear Time (g_c+I1), s	4.0	23.4		23.0	7.4	50.0		5.0				
Green Ext Time (p_c), s	0.0	6.0		0.0	0.0	0.0		0.3				
Intersection Summary												
HCM 6th Ctrl Delay			38.8									
HCM 6th LOS			D									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	68	55	62	35	50	87	88	969	33	65	1132	132
Future Volume (veh/h)	68	55	62	35	50	87	88	969	33	65	1132	132
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1411	1411	1411	625	625	625	1574	1574	1574	1678	1678	1678
Adj Flow Rate, veh/h	68	55	62	35	50	87	88	969	33	65	1132	132
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	33	33	33	86	86	86	22	22	22	15	15	15
Cap, veh/h	133	91	78	173	137	116	127	1482	50	104	1389	162
Arrive On Green	0.22	0.22	0.22	0.22	0.22	0.22	0.08	0.50	0.50	0.07	0.48	0.48
Sat Flow, veh/h	288	414	354	426	625	530	1499	2951	100	1598	2876	335
Grp Volume(v), veh/h	185	0	0	35	50	87	88	491	511	65	626	638
Grp Sat Flow(s),veh/h/ln	1057	0	0	426	625	530	1499	1495	1556	1598	1594	1617
Q Serve(g_s), s	7.2	0.0	0.0	0.0	4.8	10.8	4.0	17.1	17.1	2.8	23.6	23.7
Cycle Q Clear(g_c), s	12.0	0.0	0.0	7.4	4.8	10.8	4.0	17.1	17.1	2.8	23.6	23.7
Prop In Lane	0.37		0.34	1.00		1.00	1.00		0.06	1.00		0.21
Lane Grp Cap(c), veh/h	302	0	0	173	137	116	127	751	782	104	770	781
V/C Ratio(X)	0.61	0.00	0.00	0.20	0.36	0.75	0.69	0.65	0.65	0.62	0.81	0.82
Avail Cap(c_a), veh/h	392	0	0	207	187	158	192	935	973	227	1020	1035
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.2	0.0	0.0	24.3	23.3	25.7	31.3	13.0	13.0	32.0	15.5	15.5
Incr Delay (d2), s/veh	2.0	0.0	0.0	0.6	1.6	12.3	6.6	1.1	1.1	5.9	3.9	3.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	0.0	0.0	0.5	0.7	1.6	1.5	4.4	4.6	1.1	7.1	7.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.2	0.0	0.0	24.9	24.9	37.9	37.9	14.1	14.1	38.0	19.4	19.4
LnGrp LOS	C	A	A	C	C	D	D	B	B	D	B	B
Approach Vol, veh/h		185			172			1090			1329	
Approach Delay, s/veh		28.2			31.5			16.0			20.3	
Approach LOS		C			C			B			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.6	40.3		20.4	11.0	39.0		20.4				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	9.0	43.0		20.0	8.0	44.0		20.0				
Max Q Clear Time (g_c+I1), s	4.8	19.1		14.0	6.0	25.7		12.8				
Green Ext Time (p_c), s	0.0	5.9		0.5	0.0	7.3		0.5				
Intersection Summary												
HCM 6th Ctrl Delay			19.8									
HCM 6th LOS			B									

Intersection	
Int Delay, s/veh	0.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	36	1029	7	46	1157
Future Vol, veh/h	0	36	1029	7	46	1157
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	200	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	59	59	20	20	15	15
Mvmt Flow	0	36	1029	7	46	1157

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1704	518	0	0	1036	0
Stage 1	1033	-	-	-	-	-
Stage 2	671	-	-	-	-	-
Critical Hdwy	7.98	8.08	-	-	4.4	-
Critical Hdwy Stg 1	6.98	-	-	-	-	-
Critical Hdwy Stg 2	6.98	-	-	-	-	-
Follow-up Hdwy	4.09	3.89	-	-	2.35	-
Pot Cap-1 Maneuver	46	378	-	-	594	-
Stage 1	202	-	-	-	-	-
Stage 2	342	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	42	378	-	-	594	-
Mov Cap-2 Maneuver	131	-	-	-	-	-
Stage 1	202	-	-	-	-	-
Stage 2	316	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.5	0	0.4
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	378	594	-
HCM Lane V/C Ratio	-	-	0.095	0.077	-
HCM Control Delay (s)	-	-	15.5	11.6	-
HCM Lane LOS	-	-	C	B	-
HCM 95th %tile Q(veh)	-	-	0.3	0.3	-

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	59	141	78	1004	1134	44
Future Volume (veh/h)	59	141	78	1004	1134	44
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	59	141	78	1004	1134	44
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	225	201	122	2661	2219	86
Arrive On Green	0.13	0.13	0.07	0.75	0.64	0.64
Sat Flow, veh/h	1781	1585	1781	3647	3581	135
Grp Volume(v), veh/h	59	141	78	1004	578	600
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1777	1777	1846
Q Serve(g_s), s	2.4	6.8	3.4	7.9	14.0	14.0
Cycle Q Clear(g_c), s	2.4	6.8	3.4	7.9	14.0	14.0
Prop In Lane	1.00	1.00	1.00			0.07
Lane Grp Cap(c), veh/h	225	201	122	2661	1131	1175
V/C Ratio(X)	0.26	0.70	0.64	0.38	0.51	0.51
Avail Cap(c_a), veh/h	445	396	233	2661	1131	1175
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.6	33.6	36.3	3.5	7.9	7.9
Incr Delay (d2), s/veh	0.6	4.4	5.4	0.4	1.7	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.2	1.6	2.0	5.0	5.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	32.2	38.0	41.8	3.9	9.5	9.4
LnGrp LOS	C	D	D	A	A	A
Approach Vol, veh/h	200			1082	1178	
Approach Delay, s/veh	36.3			6.7	9.5	
Approach LOS	D			A	A	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		65.0		15.1	9.0	56.0
Change Period (Y+Rc), s		6.0		6.0	4.5	6.0
Max Green Setting (Gmax), s		59.0		19.0	9.5	45.0
Max Q Clear Time (g_c+I1), s		9.9		8.8	5.4	16.0
Green Ext Time (p_c), s		9.4		0.4	0.0	9.5
Intersection Summary						
HCM 6th Ctrl Delay			10.4			
HCM 6th LOS			B			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	204	40	29	15	3	5	34	960	24	8	1213	250
Future Volume (veh/h)	204	40	29	15	3	5	34	960	24	8	1213	250
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1337	1337	1337	1085	1085	1085	1633	1633	1633	1633	1633	1633
Adj Flow Rate, veh/h	204	40	29	15	3	5	34	960	24	8	1213	250
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	38	38	38	55	55	55	18	18	18	18	18	18
Cap, veh/h	288	164	119	148	27	35	57	1948	49	28	1569	320
Arrive On Green	0.23	0.23	0.23	0.23	0.23	0.23	0.04	0.63	0.63	0.02	0.61	0.61
Sat Flow, veh/h	1006	720	522	434	119	154	1555	3094	77	1555	2566	524
Grp Volume(v), veh/h	204	0	69	23	0	0	34	481	503	8	729	734
Grp Sat Flow(s),veh/h/ln	1006	0	1243	707	0	0	1555	1552	1619	1555	1552	1539
Q Serve(g_s), s	16.7	0.0	5.5	1.4	0.0	0.0	2.6	20.0	20.0	0.6	41.3	42.5
Cycle Q Clear(g_c), s	23.6	0.0	5.5	6.9	0.0	0.0	2.6	20.0	20.0	0.6	41.3	42.5
Prop In Lane	1.00		0.42	0.65		0.22	1.00		0.05	1.00		0.34
Lane Grp Cap(c), veh/h	288	0	282	210	0	0	57	977	1020	28	949	941
V/C Ratio(X)	0.71	0.00	0.24	0.11	0.00	0.00	0.60	0.49	0.49	0.28	0.77	0.78
Avail Cap(c_a), veh/h	328	0	331	243	0	0	78	977	1020	78	949	941
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.84	0.84	0.84
Uniform Delay (d), s/veh	45.0	0.0	38.0	38.5	0.0	0.0	56.9	11.9	11.9	58.1	17.1	17.3
Incr Delay (d2), s/veh	5.9	0.0	0.4	0.2	0.0	0.0	9.6	1.8	1.7	4.5	5.1	5.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.4	0.0	1.7	0.6	0.0	0.0	1.1	6.3	6.6	0.3	13.6	14.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.8	0.0	38.4	38.7	0.0	0.0	66.6	13.7	13.6	62.7	22.1	22.7
LnGrp LOS	D	A	D	D	A	A	E	B	B	E	C	C
Approach Vol, veh/h		273			23			1018			1471	
Approach Delay, s/veh		47.7			38.7			15.4			22.7	
Approach LOS		D			D			B			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.2	80.6		32.2	9.4	78.4		32.2				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	5.0	66.0		31.0	5.0	66.0		31.0				
Max Q Clear Time (g_c+I1), s	2.6	22.0		25.6	4.6	44.5		8.9				
Green Ext Time (p_c), s	0.0	6.3		0.7	0.0	9.7		0.1				

Intersection Summary			
HCM 6th Ctrl Delay			22.6
HCM 6th LOS			C

Intersection						
Int Delay, s/veh	0.2					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	11	1012	17	21	1236
Future Vol, veh/h	0	11	1012	17	21	1236
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	11	1012	17	21	1236

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	515	0	0	1029	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	4.14	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	0	505	-	-	671	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	505	-	-	671	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB		NB		SB	
HCM Control Delay, s	12.3		0		0.2	
HCM LOS	B					

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	505	671	-
HCM Lane V/C Ratio	-	-	0.022	0.031	-
HCM Control Delay (s)	-	-	12.3	10.5	-
HCM Lane LOS	-	-	B	B	-
HCM 95th %tile Q(veh)	-	-	0.1	0.1	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	145	99	78	100	290	83	131	685	37	53	933	154
Future Volume (veh/h)	145	99	78	100	290	83	131	685	37	53	933	154
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1604	1604	1604	1678	1678	1678	1693	1693	1693	1737	1737	1737
Adj Flow Rate, veh/h	145	99	78	100	290	83	131	685	37	53	933	154
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	20	20	20	15	15	15	14	14	14	11	11	11
Cap, veh/h	180	287	243	134	357	100	167	1621	88	79	1540	687
Arrive On Green	0.12	0.18	0.18	0.08	0.15	0.15	0.10	0.52	0.52	0.10	0.93	0.93
Sat Flow, veh/h	1527	1604	1359	1598	2457	690	1612	3103	167	1654	3300	1472
Grp Volume(v), veh/h	145	99	78	100	186	187	131	355	367	53	933	154
Grp Sat Flow(s),veh/h/ln	1527	1604	1359	1598	1594	1553	1612	1608	1662	1654	1650	1472
Q Serve(g_s), s	11.1	6.5	6.0	7.3	13.6	14.0	9.5	16.2	16.2	3.7	5.2	1.1
Cycle Q Clear(g_c), s	11.1	6.5	6.0	7.3	13.6	14.0	9.5	16.2	16.2	3.7	5.2	1.1
Prop In Lane	1.00		1.00	1.00		0.44	1.00		0.10	1.00		1.00
Lane Grp Cap(c), veh/h	180	287	243	134	231	225	167	840	868	79	1540	687
V/C Ratio(X)	0.81	0.34	0.32	0.75	0.81	0.83	0.78	0.42	0.42	0.67	0.61	0.22
Avail Cap(c_a), veh/h	242	321	272	186	252	246	215	840	868	124	1540	687
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.6	43.1	42.9	53.7	49.6	49.8	52.5	17.6	17.6	53.3	2.3	2.2
Incr Delay (d2), s/veh	13.4	0.7	0.8	9.9	16.0	19.2	13.3	1.6	1.5	9.3	1.8	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.8	2.6	2.0	3.2	6.3	6.5	4.3	5.8	6.0	1.6	1.2	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	65.0	43.8	43.6	63.6	65.7	69.1	65.7	19.1	19.1	62.7	4.1	2.9
LnGrp LOS	E	D	D	E	E	E	E	B	B	E	A	A
Approach Vol, veh/h		322			473			853			1140	
Approach Delay, s/veh		53.3			66.6			26.3			6.7	
Approach LOS		D			E			C			A	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.7	67.7	15.1	26.5	17.5	61.0	19.1	22.4
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	8.0	52.0	13.0	23.0	15.0	45.0	18.0	18.0
Max Q Clear Time (g_c+I1), s	5.7	18.2	9.3	8.5	11.5	7.2	13.1	16.0
Green Ext Time (p_c), s	0.0	4.1	0.1	0.6	0.1	7.3	0.1	0.4

Intersection Summary	
HCM 6th Ctrl Delay	28.2
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	2.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	4	5	31	40	34	19
Future Vol, veh/h	4	5	31	40	34	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	50	50	50	50	50	50
Mvmt Flow	4	5	31	40	34	19

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	138	51	0	0	71	0
Stage 1	51	-	-	-	-	-
Stage 2	87	-	-	-	-	-
Critical Hdwy	6.9	6.7	-	-	4.6	-
Critical Hdwy Stg 1	5.9	-	-	-	-	-
Critical Hdwy Stg 2	5.9	-	-	-	-	-
Follow-up Hdwy	3.95	3.75	-	-	2.65	-
Pot Cap-1 Maneuver	754	896	-	-	1273	-
Stage 1	862	-	-	-	-	-
Stage 2	829	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	734	896	-	-	1273	-
Mov Cap-2 Maneuver	734	-	-	-	-	-
Stage 1	862	-	-	-	-	-
Stage 2	807	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.5	0	5.1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	816	1273	-
HCM Lane V/C Ratio	-	-	0.011	0.027	-
HCM Control Delay (s)	-	-	9.5	7.9	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0.1	-

Intersection						
Int Delay, s/veh	4.2					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	181	73	72	215	134	69
Future Vol, veh/h	181	73	72	215	134	69
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	200	-	200	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	181	73	72	215	134	69

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	254	0	577	218
Stage 1	-	-	-	-	218	-
Stage 2	-	-	-	-	359	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1311	-	478	822
Stage 1	-	-	-	-	818	-
Stage 2	-	-	-	-	707	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1311	-	452	822
Mov Cap-2 Maneuver	-	-	-	-	537	-
Stage 1	-	-	-	-	818	-
Stage 2	-	-	-	-	668	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2	12.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	537	822	-	-	1311	-
HCM Lane V/C Ratio	0.25	0.084	-	-	0.055	-
HCM Control Delay (s)	13.9	9.8	-	-	7.9	-
HCM Lane LOS	B	A	-	-	A	-
HCM 95th %tile Q(veh)	1	0.3	-	-	0.2	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	98	263	495	194	306	131	590	1310	204	85	818	61
Future Volume (veh/h)	98	263	495	194	306	131	590	1310	204	85	818	61
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	98	263	495	194	306	131	590	1310	204	85	818	61
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	144	758	654	246	962	429	689	1569	244	128	1089	81
Arrive On Green	0.08	0.21	0.21	0.14	0.27	0.27	0.20	0.35	0.35	0.07	0.22	0.22
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	3456	4456	694	1781	4849	360
Grp Volume(v), veh/h	98	263	495	194	306	131	590	1001	513	85	573	306
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1728	1702	1745	1781	1702	1806
Q Serve(g_s), s	4.8	5.6	19.0	9.4	6.1	5.9	14.7	24.0	24.0	4.1	14.0	14.1
Cycle Q Clear(g_c), s	4.8	5.6	19.0	9.4	6.1	5.9	14.7	24.0	24.0	4.1	14.0	14.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.40	1.00		0.20
Lane Grp Cap(c), veh/h	144	758	654	246	962	429	689	1199	615	128	764	405
V/C Ratio(X)	0.68	0.35	0.76	0.79	0.32	0.31	0.86	0.83	0.83	0.66	0.75	0.75
Avail Cap(c_a), veh/h	200	758	654	260	962	429	698	1199	615	140	764	405
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.8	29.8	22.3	37.1	25.9	25.8	34.4	26.5	26.5	40.3	32.2	32.3
Incr Delay (d2), s/veh	5.5	0.3	5.1	14.2	0.2	0.4	10.1	6.9	12.6	10.1	6.7	12.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	2.4	9.3	5.0	2.6	2.2	7.0	10.5	11.7	2.2	6.3	7.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.4	30.1	27.4	51.3	26.1	26.2	44.6	33.4	39.1	50.4	38.9	44.5
LnGrp LOS	D	C	C	D	C	C	D	C	D	D	D	D
Approach Vol, veh/h		856			631			2104			964	
Approach Delay, s/veh		30.3			33.9			37.9			41.7	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.4	36.4	17.3	24.0	22.8	25.0	12.2	29.1
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	6.0	30.0	12.0	18.0	17.0	19.0	9.0	21.0
Max Q Clear Time (g_c+I1), s	6.1	26.0	11.4	21.0	16.7	16.1	6.8	8.1
Green Ext Time (p_c), s	0.0	3.1	0.0	0.0	0.1	1.6	0.0	2.0

Intersection Summary	
HCM 6th Ctrl Delay	36.7
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	650	3	521	326	1643	0	0	1196	418
Future Volume (veh/h)	0	0	0	650	3	521	326	1643	0	0	1196	418
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1752	1752	1752	1841	1841	0	0	1856	1856
Adj Flow Rate, veh/h				813	0	348	326	1643	0	0	1196	418
Peak Hour Factor				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %				10	10	10	4	4	0	0	3	3
Cap, veh/h				1054	0	469	461	2789	0	0	2265	558
Arrive On Green				0.32	0.00	0.32	0.14	0.55	0.00	0.00	0.35	0.35
Sat Flow, veh/h				3337	0	1485	3401	5191	0	0	6643	1572
Grp Volume(v), veh/h				813	0	348	326	1643	0	0	1196	418
Grp Sat Flow(s),veh/h/ln				1668	0	1485	1700	1675	0	0	1596	1572
Q Serve(g_s), s				17.1	0.0	16.2	7.1	16.8	0.0	0.0	11.5	18.1
Cycle Q Clear(g_c), s				17.1	0.0	16.2	7.1	16.8	0.0	0.0	11.5	18.1
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				1054	0	469	461	2789	0	0	2265	558
V/C Ratio(X)				0.77	0.00	0.74	0.71	0.59	0.00	0.00	0.53	0.75
Avail Cap(c_a), veh/h				1593	0	709	614	2789	0	0	2265	558
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				24.0	0.0	23.7	32.0	11.4	0.0	0.0	19.8	22.0
Incr Delay (d2), s/veh				1.3	0.0	2.3	2.4	0.9	0.0	0.0	0.9	8.9
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				6.6	0.0	5.7	2.8	4.8	0.0	0.0	3.8	7.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				25.3	0.0	26.0	34.5	12.3	0.0	0.0	20.7	30.9
LnGrp LOS				C	A	C	C	B	A	A	C	C
Approach Vol, veh/h					1161			1969			1614	
Approach Delay, s/veh					25.5			16.0			23.4	
Approach LOS					C			B			C	

Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		48.0			15.5	32.5		29.5				
Change Period (Y+Rc), s		6.0			6.0	6.0		6.0				
Max Green Setting (Gmax), s		42.0			13.0	23.0		36.0				
Max Q Clear Time (g_c+I1), s		18.8			9.1	20.1		19.1				
Green Ext Time (p_c), s		11.7			0.4	2.1		4.4				

Intersection Summary			
HCM 6th Ctrl Delay			20.8
HCM 6th LOS			C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	618	0	463	0	0	0	0	1374	645	481	1391	0
Future Volume (veh/h)	618	0	463	0	0	0	0	1374	645	481	1391	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1767	1767	1767				0	1781	1781	1796	1796	0
Adj Flow Rate, veh/h	762	0	309				0	1374	645	481	1391	0
Peak Hour Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	9	9	9				0	8	8	7	7	0
Cap, veh/h	823	0	366				0	1412	648	516	2199	0
Arrive On Green	0.24	0.00	0.24				0.00	0.43	0.43	0.16	0.64	0.00
Sat Flow, veh/h	3365	0	1497				0	3419	1496	3319	3503	0
Grp Volume(v), veh/h	762	0	309				0	1367	652	481	1391	0
Grp Sat Flow(s),veh/h/ln	1682	0	1497				0	1621	1512	1659	1706	0
Q Serve(g_s), s	19.9	0.0	17.7				0.0	37.2	38.7	12.9	22.0	0.0
Cycle Q Clear(g_c), s	19.9	0.0	17.7				0.0	37.2	38.7	12.9	22.0	0.0
Prop In Lane	1.00		1.00				0.00		0.99	1.00		0.00
Lane Grp Cap(c), veh/h	823	0	366				0	1405	655	516	2199	0
V/C Ratio(X)	0.93	0.00	0.84				0.00	0.97	1.00	0.93	0.63	0.00
Avail Cap(c_a), veh/h	823	0	366				0	1405	655	516	2199	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	33.2	0.0	32.4				0.0	25.0	25.4	37.5	9.6	0.0
Incr Delay (d2), s/veh	16.3	0.0	16.4				0.0	18.4	34.0	23.9	1.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.7	0.0	7.9				0.0	15.6	17.8	6.5	6.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.5	0.0	48.7				0.0	43.4	59.4	61.4	11.0	0.0
LnGrp LOS	D	A	D				A	D	E	E	B	A
Approach Vol, veh/h		1071						2019			1872	
Approach Delay, s/veh		49.3						48.5			24.0	
Approach LOS		D						D			C	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	19.0	44.0		27.0		63.0						
Change Period (Y+Rc), s	6.0	6.0		6.0		6.0						
Max Green Setting (Gmax), s	13.0	38.0		21.0		57.0						
Max Q Clear Time (g_c+I1), s	14.9	40.7		21.9		24.0						
Green Ext Time (p_c), s	0.0	0.0		0.0		11.4						
Intersection Summary												
HCM 6th Ctrl Delay			39.4									
HCM 6th LOS			D									
Notes												

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	431	124	155	34	31	76	36	1450	23	28	1524	298
Future Volume (veh/h)	431	124	155	34	31	76	36	1450	23	28	1524	298
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1411	1411	1411	1767	1767	1767	1707	1707	1707
Adj Flow Rate, veh/h	431	124	155	34	31	76	36	1450	23	28	1524	298
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	7	7	7	33	33	33	9	9	9	13	13	13
Cap, veh/h	403	552	467	294	412	367	75	1633	26	64	1298	248
Arrive On Green	0.31	0.31	0.31	0.31	0.31	0.31	0.04	0.48	0.48	0.04	0.48	0.48
Sat Flow, veh/h	1236	1796	1522	830	1340	1196	1682	3382	54	1626	2718	518
Grp Volume(v), veh/h	431	124	155	34	31	76	36	719	754	28	894	928
Grp Sat Flow(s),veh/h/ln	1236	1796	1522	830	1340	1196	1682	1678	1757	1626	1622	1614
Q Serve(g_s), s	22.9	4.5	6.9	2.8	1.4	4.1	1.8	34.1	34.2	1.5	42.0	42.0
Cycle Q Clear(g_c), s	27.0	4.5	6.9	7.3	1.4	4.1	1.8	34.1	34.2	1.5	42.0	42.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.03	1.00		0.32
Lane Grp Cap(c), veh/h	403	552	467	294	412	367	75	810	848	64	775	771
V/C Ratio(X)	1.07	0.22	0.33	0.12	0.08	0.21	0.48	0.89	0.89	0.44	1.15	1.20
Avail Cap(c_a), veh/h	403	552	467	294	412	367	115	810	848	111	775	771
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.9	22.7	23.5	25.4	21.6	22.5	41.0	20.6	20.6	41.3	23.0	23.0
Incr Delay (d2), s/veh	64.3	0.2	0.4	0.2	0.1	0.3	4.7	11.7	11.4	4.6	83.6	103.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.6	1.8	2.4	0.5	0.4	1.1	0.8	13.5	14.1	0.6	31.0	35.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	99.2	22.9	23.9	25.6	21.7	22.8	45.7	32.3	32.0	45.8	106.6	126.8
LnGrp LOS	F	C	C	C	C	C	D	C	C	D	F	F
Approach Vol, veh/h		710			141			1509			1850	
Approach Delay, s/veh		69.4			23.2			32.5			115.8	
Approach LOS		E			C			C			F	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.5	47.4		32.0	8.9	47.0		32.0				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	5.0	41.0		26.0	5.0	41.0		26.0				
Max Q Clear Time (g_c+I1), s	3.5	36.2		29.0	3.8	44.0		9.3				
Green Ext Time (p_c), s	0.0	3.3		0.0	0.0	0.0		0.6				

Intersection Summary			
HCM 6th Ctrl Delay			75.0
HCM 6th LOS			E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	111	16	98	40	20	68	88	1302	20	57	1567	81
Future Volume (veh/h)	111	16	98	40	20	68	88	1302	20	57	1567	81
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1707	1707	1707	1633	1633	1633	1752	1752	1752	1707	1707	1707
Adj Flow Rate, veh/h	111	16	98	40	20	68	88	1302	20	57	1567	81
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	13	13	13	18	18	18	10	10	10	13	13	13
Cap, veh/h	183	31	116	267	325	275	118	1912	29	90	1741	90
Arrive On Green	0.20	0.20	0.20	0.20	0.20	0.20	0.07	0.57	0.57	0.06	0.55	0.55
Sat Flow, veh/h	603	155	585	1116	1633	1384	1668	3355	52	1626	3139	162
Grp Volume(v), veh/h	225	0	0	40	20	68	88	646	676	57	807	841
Grp Sat Flow(s),veh/h/ln	1343	0	0	1116	1633	1384	1668	1664	1743	1626	1622	1678
Q Serve(g_s), s	12.4	0.0	0.0	0.0	0.8	3.5	4.4	23.2	23.2	2.9	37.5	38.1
Cycle Q Clear(g_c), s	13.7	0.0	0.0	3.3	0.8	3.5	4.4	23.2	23.2	2.9	37.5	38.1
Prop In Lane	0.49		0.44	1.00		1.00	1.00		0.03	1.00		0.10
Lane Grp Cap(c), veh/h	330	0	0	267	325	275	118	948	993	90	899	931
V/C Ratio(X)	0.68	0.00	0.00	0.15	0.06	0.25	0.75	0.68	0.68	0.63	0.90	0.90
Avail Cap(c_a), veh/h	362	0	0	294	364	309	118	958	1003	134	952	985
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.7	0.0	0.0	28.6	27.7	28.7	38.8	12.9	12.9	39.4	16.8	16.9
Incr Delay (d2), s/veh	4.6	0.0	0.0	0.3	0.1	0.5	23.0	2.0	1.9	7.2	10.7	11.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.6	0.0	0.0	0.7	0.3	1.1	2.4	7.0	7.3	1.3	13.2	13.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.3	0.0	0.0	28.9	27.7	29.2	61.8	14.8	14.8	46.6	27.5	28.1
LnGrp LOS	D	A	A	C	C	C	E	B	B	D	C	C
Approach Vol, veh/h		225			128			1410			1705	
Approach Delay, s/veh		37.3			28.9			17.7			28.4	
Approach LOS		D			C			B			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.7	53.5		21.9	11.0	52.2		21.9				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	6.0	48.0		18.0	5.0	49.0		18.0				
Max Q Clear Time (g_c+I1), s	4.9	25.2		15.7	6.4	40.1		5.5				
Green Ext Time (p_c), s	0.0	8.4		0.3	0.0	6.1		0.3				
Intersection Summary												
HCM 6th Ctrl Delay			24.7									
HCM 6th LOS			C									

Intersection						
Int Delay, s/veh	0.4					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	3	36	1297	9	37	1695
Future Vol, veh/h	3	36	1297	9	37	1695
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	200	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	32	32	9	9	12	12
Mvmt Flow	3	36	1297	9	37	1695

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2224	653	0	0	1306	0
Stage 1	1302	-	-	-	-	-
Stage 2	922	-	-	-	-	-
Critical Hdwy	7.44	7.54	-	-	4.34	-
Critical Hdwy Stg 1	6.44	-	-	-	-	-
Critical Hdwy Stg 2	6.44	-	-	-	-	-
Follow-up Hdwy	3.82	3.62	-	-	2.32	-
Pot Cap-1 Maneuver	25	345	-	-	475	-
Stage 1	169	-	-	-	-	-
Stage 2	284	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	23	345	-	-	475	-
Mov Cap-2 Maneuver	104	-	-	-	-	-
Stage 1	169	-	-	-	-	-
Stage 2	262	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	19.2	0	0.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	293	475	-
HCM Lane V/C Ratio	-	-	0.133	0.078	-
HCM Control Delay (s)	-	-	19.2	13.2	-
HCM Lane LOS	-	-	C	B	-
HCM 95th %tile Q(veh)	-	-	0.5	0.3	-

Movement	EBL	EBR	NBU	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (veh/h)	31	161	2	102	1259	1637	55
Future Volume (veh/h)	31	161	2	102	1259	1637	55
Initial Q (Qb), veh	0	0		0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00			1.00
Parking Bus, Adj	1.00	1.00		1.00	1.00	1.00	1.00
Work Zone On Approach	No				No	No	
Adj Sat Flow, veh/h/ln	1870	1870		1870	1870	1870	1870
Adj Flow Rate, veh/h	31	161		102	1259	1637	55
Peak Hour Factor	1.00	1.00		1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2		2	2	2	2
Cap, veh/h	243	217		151	2636	2156	72
Arrive On Green	0.14	0.14		0.08	0.74	0.61	0.61
Sat Flow, veh/h	1781	1585		1781	3647	3602	118
Grp Volume(v), veh/h	31	161		102	1259	826	866
Grp Sat Flow(s),veh/h/ln	1781	1585		1781	1777	1777	1849
Q Serve(g_s), s	1.3	8.0		4.6	11.7	27.6	27.9
Cycle Q Clear(g_c), s	1.3	8.0		4.6	11.7	27.6	27.9
Prop In Lane	1.00	1.00		1.00			0.06
Lane Grp Cap(c), veh/h	243	217		151	2636	1092	1136
V/C Ratio(X)	0.13	0.74		0.68	0.48	0.76	0.76
Avail Cap(c_a), veh/h	412	366		193	2636	1092	1136
HCM Platoon Ratio	1.00	1.00		1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00		1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.2	34.1		36.6	4.2	11.4	11.5
Incr Delay (d2), s/veh	0.2	5.0		6.3	0.6	4.9	4.8
Initial Q Delay(d3),s/veh	0.0	0.0		0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.3		2.2	3.2	10.6	11.1
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	31.4	39.1		42.8	4.9	16.3	16.3
LnGrp LOS	C	D		D	A	B	B
Approach Vol, veh/h	192				1361	1692	
Approach Delay, s/veh	37.9				7.7	16.3	
Approach LOS	D				A	B	
Timer - Assigned Phs		2		4	5	6	
Phs Duration (G+Y+Rc), s		66.0		16.2	10.5	55.5	
Change Period (Y+Rc), s		6.0		6.0	4.5	6.0	
Max Green Setting (Gmax), s		60.0		18.0	7.9	47.6	
Max Q Clear Time (g_c+I1), s		13.7		10.0	6.6	29.9	
Green Ext Time (p_c), s		13.2		0.3	0.0	11.8	
Intersection Summary							
HCM 6th Ctrl Delay			14.0				
HCM 6th LOS			B				
Notes							

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	253	46	74	7	1	6	28	1080	24	22	1222	249
Future Volume (veh/h)	253	46	74	7	1	6	28	1080	24	22	1222	249
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1648	1648	1648	1826	1826	1826	1737	1737	1737	1678	1678	1678
Adj Flow Rate, veh/h	253	46	74	7	1	6	28	1080	24	22	1222	249
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	17	17	17	5	5	5	11	11	11	15	15	15
Cap, veh/h	344	136	219	165	33	115	56	1998	44	48	1590	321
Arrive On Green	0.24	0.24	0.24	0.24	0.24	0.24	0.07	1.00	1.00	0.03	0.60	0.60
Sat Flow, veh/h	1241	569	915	501	139	480	1654	3301	73	1598	2642	533
Grp Volume(v), veh/h	253	0	120	14	0	0	28	540	564	22	733	738
Grp Sat Flow(s),veh/h/ln	1241	0	1483	1120	0	0	1654	1650	1724	1598	1594	1582
Q Serve(g_s), s	16.9	0.0	8.0	0.1	0.0	0.0	2.0	0.0	0.0	1.6	40.7	41.8
Cycle Q Clear(g_c), s	25.0	0.0	8.0	8.1	0.0	0.0	2.0	0.0	0.0	1.6	40.7	41.8
Prop In Lane	1.00		0.62	0.50		0.43	1.00		0.04	1.00		0.34
Lane Grp Cap(c), veh/h	344	0	355	313	0	0	56	999	1044	48	959	952
V/C Ratio(X)	0.74	0.00	0.34	0.04	0.00	0.00	0.50	0.54	0.54	0.46	0.76	0.78
Avail Cap(c_a), veh/h	388	0	408	363	0	0	83	999	1044	80	959	952
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.62	0.62	0.62
Uniform Delay (d), s/veh	44.6	0.0	37.7	35.1	0.0	0.0	55.0	0.0	0.0	57.2	17.6	17.8
Incr Delay (d2), s/veh	6.3	0.0	0.6	0.1	0.0	0.0	6.9	2.1	2.0	4.2	3.6	3.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.9	0.0	3.0	0.3	0.0	0.0	0.9	0.6	0.6	0.7	13.5	13.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.9	0.0	38.3	35.2	0.0	0.0	61.9	2.1	2.0	61.4	21.3	21.7
LnGrp LOS	D	A	D	D	A	A	E	A	A	E	C	C
Approach Vol, veh/h		373			14			1132			1493	
Approach Delay, s/veh		46.8			35.2			3.5			22.1	
Approach LOS		D			D			A			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.6	77.6		33.8	9.0	77.2		33.8				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	5.0	65.0		32.0	5.0	65.0		32.0				
Max Q Clear Time (g_c+I1), s	3.6	2.0		27.0	4.0	43.8		10.1				
Green Ext Time (p_c), s	0.0	7.6		0.8	0.0	9.7		0.0				
Intersection Summary												
HCM 6th Ctrl Delay			18.2									
HCM 6th LOS			B									

Intersection						
Int Delay, s/veh	0.2					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	35	1112	7	9	1293
Future Vol, veh/h	0	35	1112	7	9	1293
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	35	1112	7	9	1293

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	560	0	0	1119	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	4.14	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	0	472	-	-	620	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	472	-	-	620	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.2	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	472	620	-
HCM Lane V/C Ratio	-	-	0.074	0.015	-
HCM Control Delay (s)	-	-	13.2	10.9	-
HCM Lane LOS	-	-	B	B	-
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	165	423	184	76	175	111	132	754	82	105	1015	144
Future Volume (veh/h)	165	423	184	76	175	111	132	754	82	105	1015	144
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1767	1767	1767	1604	1604	1604	1767	1767	1767	1781	1781	1781
Adj Flow Rate, veh/h	165	423	184	76	175	111	132	754	82	105	1015	144
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	9	9	9	20	20	20	9	9	9	8	8	8
Cap, veh/h	205	468	396	105	387	233	169	1277	139	139	1352	603
Arrive On Green	0.12	0.26	0.26	0.07	0.21	0.21	0.10	0.42	0.42	0.16	0.80	0.80
Sat Flow, veh/h	1682	1767	1497	1527	1829	1100	1682	3053	332	1697	3385	1510
Grp Volume(v), veh/h	165	423	184	76	144	142	132	414	422	105	1015	144
Grp Sat Flow(s),veh/h/ln	1682	1767	1497	1527	1523	1406	1682	1678	1707	1697	1692	1510
Q Serve(g_s), s	11.5	27.8	12.4	5.9	9.9	10.6	9.2	22.9	22.9	7.1	18.1	2.8
Cycle Q Clear(g_c), s	11.5	27.8	12.4	5.9	9.9	10.6	9.2	22.9	22.9	7.1	18.1	2.8
Prop In Lane	1.00		1.00	1.00		0.78	1.00		0.19	1.00		1.00
Lane Grp Cap(c), veh/h	205	468	396	105	322	297	169	702	714	139	1352	603
V/C Ratio(X)	0.81	0.90	0.46	0.73	0.45	0.48	0.78	0.59	0.59	0.76	0.75	0.24
Avail Cap(c_a), veh/h	294	501	424	115	322	297	182	702	714	156	1352	603
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.3	42.7	37.0	54.8	41.2	41.5	52.7	27.0	27.0	49.0	9.1	7.5
Incr Delay (d2), s/veh	10.1	19.1	0.8	18.6	1.0	1.2	18.1	3.6	3.6	17.0	3.9	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.3	14.1	4.5	2.7	3.7	3.7	4.6	9.2	9.3	3.4	3.7	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.4	61.8	37.8	73.4	42.2	42.7	70.7	30.6	30.5	66.0	12.9	8.5
LnGrp LOS	E	E	D	E	D	D	E	C	C	E	B	A
Approach Vol, veh/h		772			362			968			1264	
Approach Delay, s/veh		56.0			48.9			36.0			16.8	
Approach LOS		E			D			D			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.8	55.2	13.2	36.8	17.1	52.9	19.6	30.4				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	10.0	45.0	8.0	33.0	12.0	43.0	20.0	21.0				
Max Q Clear Time (g_c+I1), s	9.1	24.9	7.9	29.8	11.2	20.1	13.5	12.6				
Green Ext Time (p_c), s	0.0	4.4	0.0	1.0	0.0	7.1	0.2	0.9				
Intersection Summary												
HCM 6th Ctrl Delay			34.8									
HCM 6th LOS			C									

Intersection	
Int Delay, s/veh	1.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	5	73	19	16	12
Future Vol, veh/h	5	5	73	19	16	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	50	50	50	50	50	50
Mvmt Flow	5	5	73	19	16	12

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	127	83	0	0	92	0
Stage 1	83	-	-	-	-	-
Stage 2	44	-	-	-	-	-
Critical Hdwy	6.9	6.7	-	-	4.6	-
Critical Hdwy Stg 1	5.9	-	-	-	-	-
Critical Hdwy Stg 2	5.9	-	-	-	-	-
Follow-up Hdwy	3.95	3.75	-	-	2.65	-
Pot Cap-1 Maneuver	765	859	-	-	1249	-
Stage 1	832	-	-	-	-	-
Stage 2	869	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	755	859	-	-	1249	-
Mov Cap-2 Maneuver	755	-	-	-	-	-
Stage 1	832	-	-	-	-	-
Stage 2	858	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.5	0	4.5
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	804	1249	-
HCM Lane V/C Ratio	-	-	0.012	0.013	-
HCM Control Delay (s)	-	-	9.5	7.9	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	3.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	275	146	70	208	81	92
Future Vol, veh/h	275	146	70	208	81	92
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	200	-	200	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	275	146	70	208	81	92

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	421	0	696	348
Stage 1	-	-	-	-	348	-
Stage 2	-	-	-	-	348	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1138	-	408	695
Stage 1	-	-	-	-	715	-
Stage 2	-	-	-	-	715	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1138	-	383	695
Mov Cap-2 Maneuver	-	-	-	-	490	-
Stage 1	-	-	-	-	715	-
Stage 2	-	-	-	-	671	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.1	12.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	490	695	-	-	1138	-
HCM Lane V/C Ratio	0.165	0.132	-	-	0.062	-
HCM Control Delay (s)	13.8	11	-	-	8.4	-
HCM Lane LOS	B	B	-	-	A	-
HCM 95th %tile Q(veh)	0.6	0.5	-	-	0.2	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	192	570	186	177	38	371	657	166	65	1208	30
Future Volume (veh/h)	38	192	570	186	177	38	371	657	166	65	1208	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	38	192	570	186	177	38	371	657	166	65	1208	30
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	81	766	564	238	1079	481	486	1493	371	103	1453	36
Arrive On Green	0.05	0.22	0.22	0.13	0.30	0.30	0.14	0.37	0.37	0.06	0.28	0.28
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	3456	4078	1014	1781	5124	127
Grp Volume(v), veh/h	38	192	570	186	177	38	371	547	276	65	802	436
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1728	1702	1688	1781	1702	1847
Q Serve(g_s), s	1.8	4.0	19.0	8.9	3.2	1.5	9.1	10.7	10.9	3.1	19.5	19.5
Cycle Q Clear(g_c), s	1.8	4.0	19.0	8.9	3.2	1.5	9.1	10.7	10.9	3.1	19.5	19.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.60	1.00		0.07
Lane Grp Cap(c), veh/h	81	766	564	238	1079	481	486	1246	618	103	965	524
V/C Ratio(X)	0.47	0.25	1.01	0.78	0.16	0.08	0.76	0.44	0.45	0.63	0.83	0.83
Avail Cap(c_a), veh/h	121	766	564	242	1079	481	549	1246	618	162	965	524
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.0	28.7	28.4	36.9	22.5	21.9	36.5	21.1	21.2	40.6	29.6	29.6
Incr Delay (d2), s/veh	4.1	0.2	40.4	14.8	0.1	0.1	5.6	1.1	2.3	6.2	8.3	14.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	1.7	17.6	4.8	1.3	0.6	4.2	4.3	4.6	1.5	8.8	10.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.2	28.9	68.8	51.8	22.6	22.0	42.1	22.2	23.5	46.8	37.9	43.9
LnGrp LOS	D	C	F	D	C	C	D	C	C	D	D	D
Approach Vol, veh/h		800			401			1194			1303	
Approach Delay, s/veh		58.1			36.1			28.7			40.4	
Approach LOS		E			D			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.1	37.3	16.8	24.0	17.4	30.0	9.0	31.8
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	7.0	30.0	11.0	18.0	13.0	24.0	5.0	24.0
Max Q Clear Time (g_c+I1), s	5.1	12.9	10.9	21.0	11.1	21.5	3.8	5.2
Green Ext Time (p_c), s	0.0	5.2	0.0	0.0	0.3	1.8	0.0	1.1

Intersection Summary	
HCM 6th Ctrl Delay	40.0
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	605	5	390	340	961	0	0	1116	577
Future Volume (veh/h)	0	0	0	605	5	390	340	961	0	0	1116	577
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1737	1737	1737	1678	1678	0	0	1870	1870
Adj Flow Rate, veh/h				728	0	262	340	961	0	0	1116	577
Peak Hour Factor				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %				11	11	11	15	15	0	0	2	2
Cap, veh/h				922	0	410	451	2744	0	0	2525	622
Arrive On Green				0.28	0.00	0.28	0.15	0.60	0.00	0.00	0.39	0.39
Sat Flow, veh/h				3309	0	1472	3100	4731	0	0	6696	1585
Grp Volume(v), veh/h				728	0	262	340	961	0	0	1116	577
Grp Sat Flow(s),veh/h/ln				1654	0	1472	1550	1527	0	0	1609	1585
Q Serve(g_s), s				16.6	0.0	12.8	8.6	8.7	0.0	0.0	10.4	28.4
Cycle Q Clear(g_c), s				16.6	0.0	12.8	8.6	8.7	0.0	0.0	10.4	28.4
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				922	0	410	451	2744	0	0	2525	622
V/C Ratio(X)				0.79	0.00	0.64	0.75	0.35	0.00	0.00	0.44	0.93
Avail Cap(c_a), veh/h				1254	0	558	531	2744	0	0	2525	622
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				27.3	0.0	25.9	33.5	8.3	0.0	0.0	18.3	23.7
Incr Delay (d2), s/veh				2.4	0.0	1.7	5.1	0.4	0.0	0.0	0.6	22.1
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				6.6	0.0	4.5	3.3	2.2	0.0	0.0	3.4	12.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				29.7	0.0	27.5	38.7	8.7	0.0	0.0	18.8	45.8
LnGrp LOS				C	A	C	D	A	A	A	B	D
Approach Vol, veh/h					990			1301			1693	
Approach Delay, s/veh					29.2			16.5			28.0	
Approach LOS					C			B			C	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		54.0			16.9	37.1		27.8				
Change Period (Y+Rc), s		6.0			6.0	6.0		6.0				
Max Green Setting (Gmax), s		48.0			13.0	29.0		30.0				
Max Q Clear Time (g_c+I1), s		10.7			10.6	30.4		18.6				
Green Ext Time (p_c), s		6.8			0.3	0.0		3.1				
Intersection Summary												
HCM 6th Ctrl Delay			24.5									
HCM 6th LOS			C									
Notes												

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	350	8	525	0	0	0	0	948	429	415	1308	0
Future Volume (veh/h)	350	8	525	0	0	0	0	948	429	415	1308	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1693	1693	1693				0	1574	1574	1796	1796	0
Adj Flow Rate, veh/h	236	0	652				0	948	429	415	1308	0
Peak Hour Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	14	14	14				0	22	22	7	7	0
Cap, veh/h	425	0	756				0	1189	538	516	2126	0
Arrive On Green	0.26	0.00	0.26				0.00	0.41	0.41	0.16	0.62	0.00
Sat Flow, veh/h	1612	0	2869				0	3036	1309	3319	3503	0
Grp Volume(v), veh/h	236	0	652				0	938	439	415	1308	0
Grp Sat Flow(s),veh/h/ln	1612	0	1434				0	1432	1338	1659	1706	0
Q Serve(g_s), s	11.1	0.0	19.1				0.0	25.3	25.3	10.7	20.7	0.0
Cycle Q Clear(g_c), s	11.1	0.0	19.1				0.0	25.3	25.3	10.7	20.7	0.0
Prop In Lane	1.00		1.00				0.00		0.98	1.00		0.00
Lane Grp Cap(c), veh/h	425	0	756				0	1177	550	516	2126	0
V/C Ratio(X)	0.56	0.00	0.86				0.00	0.80	0.80	0.80	0.62	0.00
Avail Cap(c_a), veh/h	456	0	812				0	1177	550	526	2126	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	28.0	0.0	31.0				0.0	22.8	22.8	36.0	10.2	0.0
Incr Delay (d2), s/veh	1.3	0.0	9.0				0.0	5.7	11.4	8.7	1.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.3	0.0	7.3				0.0	8.2	8.5	4.6	5.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.3	0.0	39.9				0.0	28.4	34.2	44.7	11.5	0.0
LnGrp LOS	C	A	D				A	C	C	D	B	A
Approach Vol, veh/h		888						1377			1723	
Approach Delay, s/veh		37.1						30.3			19.5	
Approach LOS		D						C			B	

Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	18.7	41.3		28.3		60.0						
Change Period (Y+Rc), s	6.0	6.0		6.0		6.0						
Max Green Setting (Gmax), s	13.0	35.0		24.0		54.0						
Max Q Clear Time (g_c+I1), s	12.7	27.3		21.1		22.7						
Green Ext Time (p_c), s	0.1	4.7		1.2		10.2						

Intersection Summary			
HCM 6th Ctrl Delay			27.1
HCM 6th LOS			C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	266	21	79	35	29	31	89	1009	31	38	1335	446
Future Volume (veh/h)	266	21	79	35	29	31	89	1009	31	38	1335	446
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1693	1693	1693	1455	1455	1455	1500	1500	1500	1722	1722	1722
Adj Flow Rate, veh/h	266	21	79	35	29	31	89	1009	31	38	1335	446
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	14	14	14	30	30	30	27	27	27	12	12	12
Cap, veh/h	316	361	306	286	295	263	96	1616	50	75	1340	431
Arrive On Green	0.21	0.21	0.21	0.21	0.21	0.21	0.07	0.57	0.57	0.05	0.55	0.55
Sat Flow, veh/h	1215	1693	1434	1008	1383	1233	1428	2822	87	1640	2435	783
Grp Volume(v), veh/h	266	21	79	35	29	31	89	509	531	38	880	901
Grp Sat Flow(s),veh/h/ln	1215	1693	1434	1008	1383	1233	1428	1425	1484	1640	1636	1581
Q Serve(g_s), s	17.2	0.9	4.1	2.6	1.5	1.8	5.5	21.2	21.2	2.0	46.5	49.0
Cycle Q Clear(g_c), s	19.0	0.9	4.1	3.4	1.5	1.8	5.5	21.2	21.2	2.0	46.5	49.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.06	1.00		0.49
Lane Grp Cap(c), veh/h	316	361	306	286	295	263	96	816	850	75	901	871
V/C Ratio(X)	0.84	0.06	0.26	0.12	0.10	0.12	0.92	0.62	0.62	0.51	0.98	1.04
Avail Cap(c_a), veh/h	316	361	306	286	295	263	96	816	850	111	901	871
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.9	27.9	29.1	29.2	28.1	28.2	41.3	12.7	12.7	41.5	19.4	20.0
Incr Delay (d2), s/veh	18.3	0.1	0.4	0.2	0.1	0.2	67.4	1.5	1.4	5.3	24.3	39.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.2	0.3	1.4	0.6	0.5	0.5	3.6	5.5	5.8	0.9	19.6	23.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.2	27.9	29.6	29.4	28.3	28.4	108.7	14.2	14.1	46.8	43.8	59.9
LnGrp LOS	E	C	C	C	C	C	F	B	B	D	D	F
Approach Vol, veh/h		366			95			1129			1819	
Approach Delay, s/veh		48.1			28.7			21.6			51.8	
Approach LOS		D			C			C			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.0	56.0		24.0	11.0	54.0		24.0				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	5.0	49.0		18.0	5.0	48.0		18.0				
Max Q Clear Time (g_c+I1), s	4.0	23.2		21.0	7.5	51.0		5.4				
Green Ext Time (p_c), s	0.0	6.4		0.0	0.0	0.0		0.3				
Intersection Summary												
HCM 6th Ctrl Delay			40.8									
HCM 6th LOS			D									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	68	55	65	35	50	87	89	998	33	65	1230	132
Future Volume (veh/h)	68	55	65	35	50	87	89	998	33	65	1230	132
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1411	1411	1411	625	625	625	1574	1574	1574	1678	1678	1678
Adj Flow Rate, veh/h	68	55	65	35	50	87	89	998	33	65	1230	132
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	33	33	33	86	86	86	22	22	22	15	15	15
Cap, veh/h	126	88	79	160	137	116	126	1548	51	100	1459	156
Arrive On Green	0.22	0.22	0.22	0.22	0.22	0.22	0.08	0.52	0.52	0.06	0.50	0.50
Sat Flow, veh/h	283	401	362	425	625	530	1499	2954	98	1598	2905	311
Grp Volume(v), veh/h	188	0	0	35	50	87	89	505	526	65	673	689
Grp Sat Flow(s),veh/h/ln	1046	0	0	425	625	530	1499	1495	1556	1598	1594	1622
Q Serve(g_s), s	8.3	0.0	0.0	0.0	5.2	11.8	4.4	18.7	18.7	3.1	28.0	28.3
Cycle Q Clear(g_c), s	13.5	0.0	0.0	8.7	5.2	11.8	4.4	18.7	18.7	3.1	28.0	28.3
Prop In Lane	0.36		0.35	1.00		1.00	1.00		0.06	1.00		0.19
Lane Grp Cap(c), veh/h	292	0	0	160	137	116	126	784	816	100	801	815
V/C Ratio(X)	0.64	0.00	0.00	0.22	0.37	0.75	0.70	0.64	0.64	0.65	0.84	0.85
Avail Cap(c_a), veh/h	339	0	0	178	162	138	156	874	910	208	973	990
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.0	0.0	0.0	26.9	25.6	28.1	34.3	13.2	13.2	35.3	16.5	16.6
Incr Delay (d2), s/veh	3.3	0.0	0.0	0.7	1.6	17.2	10.3	1.4	1.3	6.9	5.7	5.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	0.0	0.0	0.6	0.8	1.9	1.8	5.0	5.2	1.3	9.0	9.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.2	0.0	0.0	27.6	27.2	45.4	44.6	14.6	14.5	42.1	22.2	22.4
LnGrp LOS	C	A	A	C	C	D	D	B	B	D	C	C
Approach Vol, veh/h		188			172			1120			1427	
Approach Delay, s/veh		32.2			36.5			16.9			23.2	
Approach LOS		C			D			B			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.8	45.4		21.8	11.5	43.7		21.8				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	9.0	44.0		19.0	7.0	46.0		19.0				
Max Q Clear Time (g_c+I1), s	5.1	20.7		15.5	6.4	30.3		13.8				
Green Ext Time (p_c), s	0.0	6.1		0.3	0.0	7.4		0.4				
Intersection Summary												
HCM 6th Ctrl Delay			22.2									
HCM 6th LOS			C									

Intersection	
Int Delay, s/veh	1.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	66	1029	7	146	1157
Future Vol, veh/h	0	66	1029	7	146	1157
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	200	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	59	59	20	20	15	15
Mvmt Flow	0	66	1029	7	146	1157

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1904	518	0	0	1036	0
Stage 1	1033	-	-	-	-	-
Stage 2	871	-	-	-	-	-
Critical Hdwy	7.98	8.08	-	-	4.4	-
Critical Hdwy Stg 1	6.98	-	-	-	-	-
Critical Hdwy Stg 2	6.98	-	-	-	-	-
Follow-up Hdwy	4.09	3.89	-	-	2.35	-
Pot Cap-1 Maneuver	32	378	-	-	594	-
Stage 1	202	-	-	-	-	-
Stage 2	256	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	24	378	-	-	594	-
Mov Cap-2 Maneuver	101	-	-	-	-	-
Stage 1	202	-	-	-	-	-
Stage 2	193	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.5	0	1.5
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	378	594	-
HCM Lane V/C Ratio	-	-	0.175	0.246	-
HCM Control Delay (s)	-	-	16.5	13	-
HCM Lane LOS	-	-	C	B	-
HCM 95th %tile Q(veh)	-	-	0.6	1	-

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	59	141	78	1004	1134	44
Future Volume (veh/h)	59	141	78	1004	1134	44
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	59	141	78	1004	1134	44
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	225	201	122	2661	2219	86
Arrive On Green	0.13	0.13	0.07	0.75	0.64	0.64
Sat Flow, veh/h	1781	1585	1781	3647	3581	135
Grp Volume(v), veh/h	59	141	78	1004	578	600
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1777	1777	1846
Q Serve(g_s), s	2.4	6.8	3.4	7.9	14.0	14.0
Cycle Q Clear(g_c), s	2.4	6.8	3.4	7.9	14.0	14.0
Prop In Lane	1.00	1.00	1.00			0.07
Lane Grp Cap(c), veh/h	225	201	122	2661	1131	1175
V/C Ratio(X)	0.26	0.70	0.64	0.38	0.51	0.51
Avail Cap(c_a), veh/h	445	396	233	2661	1131	1175
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.6	33.6	36.3	3.5	7.9	7.9
Incr Delay (d2), s/veh	0.6	4.4	5.4	0.4	1.7	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.2	1.6	2.0	5.0	5.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	32.2	38.0	41.8	3.9	9.5	9.4
LnGrp LOS	C	D	D	A	A	A
Approach Vol, veh/h	200			1082	1178	
Approach Delay, s/veh	36.3			6.7	9.5	
Approach LOS	D			A	A	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		65.0		15.1	9.0	56.0
Change Period (Y+Rc), s		6.0		6.0	4.5	6.0
Max Green Setting (Gmax), s		59.0		19.0	9.5	45.0
Max Q Clear Time (g_c+I1), s		9.9		8.8	5.4	16.0
Green Ext Time (p_c), s		9.4		0.4	0.0	9.5

Intersection Summary			
HCM 6th Ctrl Delay			10.4
HCM 6th LOS			B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	204	45	29	29	5	5	34	960	69	8	1213	250
Future Volume (veh/h)	204	45	29	29	5	5	34	960	69	8	1213	250
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1337	1337	1337	1085	1085	1085	1633	1633	1633	1633	1633	1633
Adj Flow Rate, veh/h	204	45	29	29	5	5	34	960	69	8	1213	250
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	38	38	38	55	55	55	18	18	18	18	18	18
Cap, veh/h	289	172	111	161	24	19	57	1849	133	28	1569	320
Arrive On Green	0.23	0.23	0.23	0.23	0.23	0.23	0.07	1.00	1.00	0.02	0.61	0.61
Sat Flow, veh/h	1004	759	489	477	106	86	1555	2936	211	1555	2566	524
Grp Volume(v), veh/h	204	0	74	39	0	0	34	507	522	8	729	734
Grp Sat Flow(s),veh/h/ln	1004	0	1249	668	0	0	1555	1552	1595	1555	1552	1539
Q Serve(g_s), s	13.6	0.0	5.8	4.0	0.0	0.0	2.5	0.0	0.0	0.6	41.3	42.5
Cycle Q Clear(g_c), s	23.5	0.0	5.8	9.8	0.0	0.0	2.5	0.0	0.0	0.6	41.3	42.5
Prop In Lane	1.00		0.39	0.74		0.13	1.00		0.13	1.00		0.34
Lane Grp Cap(c), veh/h	289	0	284	204	0	0	57	977	1005	28	949	941
V/C Ratio(X)	0.71	0.00	0.26	0.19	0.00	0.00	0.60	0.52	0.52	0.28	0.77	0.78
Avail Cap(c_a), veh/h	337	0	343	243	0	0	78	977	1005	78	949	941
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.84	0.84	0.84
Uniform Delay (d), s/veh	44.9	0.0	38.1	41.0	0.0	0.0	54.8	0.0	0.0	58.1	17.1	17.3
Incr Delay (d2), s/veh	5.4	0.0	0.5	0.4	0.0	0.0	9.6	2.0	1.9	4.5	5.0	5.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.3	0.0	1.9	1.0	0.0	0.0	1.1	0.5	0.5	0.3	13.6	14.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.3	0.0	38.6	41.4	0.0	0.0	64.4	2.0	1.9	62.7	22.1	22.7
LnGrp LOS	D	A	D	D	A	A	E	A	A	E	C	C
Approach Vol, veh/h		278			39			1063			1471	
Approach Delay, s/veh		47.2			41.4			3.9			22.7	
Approach LOS		D			D			A			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.2	80.6		32.2	9.4	78.4		32.2				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	5.0	65.0		32.0	5.0	65.0		32.0				
Max Q Clear Time (g_c+I1), s	2.6	2.0		25.5	4.5	44.5		11.8				
Green Ext Time (p_c), s	0.0	6.9		0.8	0.0	9.5		0.1				

Intersection Summary		
HCM 6th Ctrl Delay		18.3
HCM 6th LOS		B

Notes

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	11	1057	17	21	1250
Future Vol, veh/h	0	11	1057	17	21	1250
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	11	1057	17	21	1250

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	537	0	0	1074	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	4.14	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	0	488	-	-	645	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	488	-	-	645	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.5	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	488	645	-
HCM Lane V/C Ratio	-	-	0.023	0.033	-
HCM Control Delay (s)	-	-	12.5	10.8	-
HCM Lane LOS	-	-	B	B	-
HCM 95th %tile Q(veh)	-	-	0.1	0.1	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↑↱		↰	↑↱		↰	↑↑	↱
Traffic Volume (veh/h)	158	99	78	100	290	91	131	709	37	55	941	158
Future Volume (veh/h)	158	99	78	100	290	91	131	709	37	55	941	158
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1604	1604	1604	1678	1678	1678	1693	1693	1693	1737	1737	1737
Adj Flow Rate, veh/h	158	99	78	100	290	91	131	709	37	55	941	158
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	20	20	20	15	15	15	14	14	14	11	11	11
Cap, veh/h	193	305	259	134	354	109	167	1585	83	82	1503	670
Arrive On Green	0.13	0.19	0.19	0.08	0.15	0.15	0.10	0.51	0.51	0.10	0.91	0.91
Sat Flow, veh/h	1527	1604	1359	1598	2400	738	1612	3109	162	1654	3300	1472
Grp Volume(v), veh/h	158	99	78	100	191	190	131	367	379	55	941	158
Grp Sat Flow(s),veh/h/ln	1527	1604	1359	1598	1594	1545	1612	1608	1663	1654	1650	1472
Q Serve(g_s), s	12.1	6.4	5.9	7.3	13.9	14.4	9.5	17.4	17.4	3.9	7.1	1.5
Cycle Q Clear(g_c), s	12.1	6.4	5.9	7.3	13.9	14.4	9.5	17.4	17.4	3.9	7.1	1.5
Prop In Lane	1.00		1.00	1.00		0.48	1.00		0.10	1.00		1.00
Lane Grp Cap(c), veh/h	193	305	259	134	235	228	167	820	848	82	1503	670
V/C Ratio(X)	0.82	0.32	0.30	0.75	0.81	0.83	0.78	0.45	0.45	0.67	0.63	0.24
Avail Cap(c_a), veh/h	255	334	283	186	252	245	215	820	848	138	1503	670
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.1	41.9	41.7	53.7	49.5	49.7	52.5	18.7	18.7	53.1	3.2	3.0
Incr Delay (d2), s/veh	14.4	0.6	0.6	9.9	16.8	20.4	13.3	1.8	1.7	9.2	2.0	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.3	2.5	2.0	3.2	6.5	6.7	4.3	6.3	6.5	1.7	1.6	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	65.5	42.5	42.4	63.6	66.3	70.1	65.7	20.4	20.4	62.3	5.2	3.8
LnGrp LOS	E	D	D	E	E	E	E	C	C	E	A	A
Approach Vol, veh/h		335			481			877			1154	
Approach Delay, s/veh		53.3			67.3			27.2			7.7	
Approach LOS		D			E			C			A	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.9	66.2	15.1	27.8	17.5	59.6	20.2	22.7
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	9.0	50.0	13.0	24.0	15.0	44.0	19.0	18.0
Max Q Clear Time (g_c+I1), s	5.9	19.4	9.3	8.4	11.5	9.1	14.1	16.4
Green Ext Time (p_c), s	0.0	4.2	0.1	0.6	0.1	7.3	0.2	0.3

Intersection Summary		
HCM 6th Ctrl Delay		29.2
HCM 6th LOS		C

Intersection						
Int Delay, s/veh	5.2					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	19	35	31	91	134	19
Future Vol, veh/h	19	35	31	91	134	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	50	50	50	50	50	50
Mvmt Flow	19	35	31	91	134	19

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	364	77	0	0	122	0
Stage 1	77	-	-	-	-	-
Stage 2	287	-	-	-	-	-
Critical Hdwy	6.9	6.7	-	-	4.6	-
Critical Hdwy Stg 1	5.9	-	-	-	-	-
Critical Hdwy Stg 2	5.9	-	-	-	-	-
Follow-up Hdwy	3.95	3.75	-	-	2.65	-
Pot Cap-1 Maneuver	550	866	-	-	1215	-
Stage 1	838	-	-	-	-	-
Stage 2	664	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	489	866	-	-	1215	-
Mov Cap-2 Maneuver	489	-	-	-	-	-
Stage 1	838	-	-	-	-	-
Stage 2	590	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.7	0	7.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	681	1215	-
HCM Lane V/C Ratio	-	-	0.079	0.11	-
HCM Control Delay (s)	-	-	10.7	8.3	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0.4	-

Intersection						
Int Delay, s/veh	4.2					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	181	73	74	215	134	74
Future Vol, veh/h	181	73	74	215	134	74
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	200	-	200	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	181	73	74	215	134	74

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	254	0	581	218
Stage 1	-	-	-	-	218	-
Stage 2	-	-	-	-	363	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1311	-	476	822
Stage 1	-	-	-	-	818	-
Stage 2	-	-	-	-	704	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1311	-	449	822
Mov Cap-2 Maneuver	-	-	-	-	534	-
Stage 1	-	-	-	-	818	-
Stage 2	-	-	-	-	665	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2	12.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	534	822	-	-	1311	-
HCM Lane V/C Ratio	0.251	0.09	-	-	0.056	-
HCM Control Delay (s)	14	9.8	-	-	7.9	-
HCM Lane LOS	B	A	-	-	A	-
HCM 95th %tile Q(veh)	1	0.3	-	-	0.2	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	98	263	495	194	306	131	590	1323	204	85	824	61
Future Volume (veh/h)	98	263	495	194	306	131	590	1323	204	85	824	61
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	98	263	495	194	306	131	590	1323	204	85	824	61
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	144	758	654	246	962	429	689	1572	242	128	1089	80
Arrive On Green	0.08	0.21	0.21	0.14	0.27	0.27	0.20	0.35	0.35	0.07	0.22	0.22
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	3456	4463	688	1781	4852	358
Grp Volume(v), veh/h	98	263	495	194	306	131	590	1009	518	85	577	308
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1728	1702	1747	1781	1702	1806
Q Serve(g_s), s	4.8	5.6	19.0	9.4	6.1	5.9	14.7	24.3	24.3	4.1	14.1	14.2
Cycle Q Clear(g_c), s	4.8	5.6	19.0	9.4	6.1	5.9	14.7	24.3	24.3	4.1	14.1	14.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.39	1.00		0.20
Lane Grp Cap(c), veh/h	144	758	654	246	962	429	689	1199	615	128	764	405
V/C Ratio(X)	0.68	0.35	0.76	0.79	0.32	0.31	0.86	0.84	0.84	0.66	0.76	0.76
Avail Cap(c_a), veh/h	200	758	654	260	962	429	698	1199	615	140	764	405
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.8	29.8	22.3	37.1	25.9	25.8	34.4	26.6	26.6	40.3	32.3	32.3
Incr Delay (d2), s/veh	5.5	0.3	5.1	14.2	0.2	0.4	10.1	7.2	13.1	10.1	6.8	12.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	2.3	9.0	4.9	2.5	2.1	6.8	10.3	11.6	2.1	6.2	7.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.4	30.1	27.4	51.3	26.1	26.2	44.6	33.8	39.7	50.4	39.1	44.9
LnGrp LOS	D	C	C	D	C	C	D	C	D	D	D	D
Approach Vol, veh/h		856			631			2117			970	
Approach Delay, s/veh		30.3			33.9			38.3			41.9	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.4	36.4	17.3	24.0	22.8	25.0	12.2	29.1
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	6.0	30.0	12.0	18.0	17.0	19.0	9.0	21.0
Max Q Clear Time (g_c+I1), s	6.1	26.3	11.4	21.0	16.7	16.2	6.8	8.1
Green Ext Time (p_c), s	0.0	2.8	0.0	0.0	0.1	1.4	0.0	1.8

Intersection Summary	
HCM 6th Ctrl Delay	36.9
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	666	3	521	362	1656	0	0	1202	418
Future Volume (veh/h)	0	0	0	666	3	521	362	1656	0	0	1202	418
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1752	1752	1752	1841	1841	0	0	1856	1856
Adj Flow Rate, veh/h				829	0	348	362	1656	0	0	1202	418
Peak Hour Factor				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %				10	10	10	4	4	0	0	3	3
Cap, veh/h				1068	0	475	498	2772	0	0	2177	536
Arrive On Green				0.32	0.00	0.32	0.15	0.55	0.00	0.00	0.34	0.34
Sat Flow, veh/h				3337	0	1485	3401	5191	0	0	6643	1572
Grp Volume(v), veh/h				829	0	348	362	1656	0	0	1202	418
Grp Sat Flow(s),veh/h/ln				1668	0	1485	1700	1675	0	0	1596	1572
Q Serve(g_s), s				17.5	0.0	16.2	7.9	17.2	0.0	0.0	11.9	18.6
Cycle Q Clear(g_c), s				17.5	0.0	16.2	7.9	17.2	0.0	0.0	11.9	18.6
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				1068	0	475	498	2772	0	0	2177	536
V/C Ratio(X)				0.78	0.00	0.73	0.73	0.60	0.00	0.00	0.55	0.78
Avail Cap(c_a), veh/h				1584	0	705	654	2772	0	0	2177	536
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				24.0	0.0	23.5	31.8	11.7	0.0	0.0	20.9	23.1
Incr Delay (d2), s/veh				1.5	0.0	2.2	2.8	1.0	0.0	0.0	1.0	10.7
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				6.7	0.0	5.7	3.1	4.9	0.0	0.0	3.9	7.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				25.4	0.0	25.7	34.6	12.7	0.0	0.0	21.9	33.8
LnGrp LOS				C	A	C	C	B	A	A	C	C
Approach Vol, veh/h					1177			2018			1620	
Approach Delay, s/veh					25.5			16.6			24.9	
Approach LOS					C			B			C	

Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		48.0			16.4	31.6		30.0				
Change Period (Y+Rc), s		6.0			6.0	6.0		6.0				
Max Green Setting (Gmax), s		42.0			14.0	22.0		36.0				
Max Q Clear Time (g_c+I1), s		19.2			9.9	20.6		19.5				
Green Ext Time (p_c), s		11.7			0.5	1.1		4.4				

Intersection Summary			
HCM 6th Ctrl Delay			21.6
HCM 6th LOS			C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	618	0	479	0	0	0	0	1423	681	481	1413	0
Future Volume (veh/h)	618	0	479	0	0	0	0	1423	681	481	1413	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1767	1767	1767				0	1781	1781	1796	1796	0
Adj Flow Rate, veh/h	767	0	319				0	1423	681	481	1413	0
Peak Hour Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	9	9	9				0	8	8	7	7	0
Cap, veh/h	785	0	349				0	1442	670	516	2237	0
Arrive On Green	0.23	0.00	0.23				0.00	0.44	0.44	0.16	0.66	0.00
Sat Flow, veh/h	3365	0	1497				0	3406	1507	3319	3503	0
Grp Volume(v), veh/h	767	0	319				0	1422	682	481	1413	0
Grp Sat Flow(s),veh/h/ln	1682	0	1497				0	1621	1510	1659	1706	0
Q Serve(g_s), s	20.4	0.0	18.7				0.0	39.0	40.0	12.9	21.9	0.0
Cycle Q Clear(g_c), s	20.4	0.0	18.7				0.0	39.0	40.0	12.9	21.9	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	785	0	349				0	1441	671	516	2237	0
V/C Ratio(X)	0.98	0.00	0.91				0.00	0.99	1.02	0.93	0.63	0.00
Avail Cap(c_a), veh/h	785	0	349				0	1441	671	516	2237	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	34.3	0.0	33.6				0.0	24.7	25.0	37.5	9.1	0.0
Incr Delay (d2), s/veh	26.4	0.0	27.5				0.0	20.7	39.0	23.9	1.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.0	0.0	9.3				0.0	16.6	19.2	6.5	6.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.6	0.0	61.1				0.0	45.4	64.0	61.4	10.5	0.0
LnGrp LOS	E	A	E				A	D	F	E	B	A
Approach Vol, veh/h		1086						2104			1894	
Approach Delay, s/veh		60.8						51.5			23.4	
Approach LOS		E						D			C	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	19.0	45.0		26.0		64.0
Change Period (Y+Rc), s	6.0	6.0		6.0		6.0
Max Green Setting (Gmax), s	13.0	39.0		20.0		57.0
Max Q Clear Time (g_c+I1), s	14.9	42.0		22.4		23.9
Green Ext Time (p_c), s	0.0	0.0		0.0		11.7

Intersection Summary			
HCM 6th Ctrl Delay			43.0
HCM 6th LOS			D

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	431	124	157	36	31	76	41	1534	28	28	1561	298
Future Volume (veh/h)	431	124	157	36	31	76	41	1534	28	28	1561	298
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1411	1411	1411	1767	1767	1767	1707	1707	1707
Adj Flow Rate, veh/h	431	124	157	36	31	76	41	1534	28	28	1561	298
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	7	7	7	33	33	33	9	9	9	13	13	13
Cap, veh/h	387	530	449	283	395	353	80	1671	30	64	1332	248
Arrive On Green	0.29	0.29	0.29	0.29	0.29	0.29	0.05	0.50	0.50	0.04	0.49	0.49
Sat Flow, veh/h	1236	1796	1522	828	1340	1196	1682	3372	61	1626	2730	508
Grp Volume(v), veh/h	431	124	157	36	31	76	41	763	799	28	910	949
Grp Sat Flow(s),veh/h/ln	1236	1796	1522	828	1340	1196	1682	1678	1756	1626	1622	1616
Q Serve(g_s), s	21.8	4.6	7.1	3.0	1.5	4.2	2.1	37.0	37.2	1.5	43.0	43.0
Cycle Q Clear(g_c), s	26.0	4.6	7.1	7.6	1.5	4.2	2.1	37.0	37.2	1.5	43.0	43.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.04	1.00		0.31
Lane Grp Cap(c), veh/h	387	530	449	283	395	353	80	832	870	64	791	788
V/C Ratio(X)	1.11	0.23	0.35	0.13	0.08	0.22	0.52	0.92	0.92	0.44	1.15	1.20
Avail Cap(c_a), veh/h	387	530	449	283	395	353	114	832	870	111	791	788
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.5	23.5	24.4	26.4	22.4	23.4	41.0	20.6	20.6	41.4	22.6	22.6
Incr Delay (d2), s/veh	80.3	0.2	0.5	0.2	0.1	0.3	5.1	14.9	14.6	4.6	82.1	103.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	16.7	1.9	2.5	0.6	0.4	1.1	0.9	15.1	15.8	0.6	31.2	35.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	115.8	23.8	24.9	26.6	22.5	23.7	46.1	35.4	35.2	46.0	104.7	126.3
LnGrp LOS	F	C	C	C	C	C	D	D	D	D	F	F
Approach Vol, veh/h		712			143			1603			1887	
Approach Delay, s/veh		79.7			24.2			35.6			114.7	
Approach LOS		E			C			D			F	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.5	48.7		31.0	9.2	48.0		31.0
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0
Max Green Setting (Gmax), s	5.0	42.0		25.0	5.0	42.0		25.0
Max Q Clear Time (g_c+I1), s	3.5	39.2		28.0	4.1	45.0		9.6
Green Ext Time (p_c), s	0.0	2.1		0.0	0.0	0.0		0.6

Intersection Summary	
HCM 6th Ctrl Delay	76.8
HCM 6th LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	111	16	99	40	20	68	91	1397	20	57	1609	81
Future Volume (veh/h)	111	16	99	40	20	68	91	1397	20	57	1609	81
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1707	1707	1707	1633	1633	1633	1752	1752	1752	1707	1707	1707
Adj Flow Rate, veh/h	111	16	99	40	20	68	91	1397	20	57	1609	81
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	13	13	13	18	18	18	10	10	10	13	13	13
Cap, veh/h	182	30	117	265	325	275	116	1925	28	89	1755	88
Arrive On Green	0.20	0.20	0.20	0.20	0.20	0.20	0.07	0.57	0.57	0.05	0.56	0.56
Sat Flow, veh/h	602	153	589	1115	1633	1384	1668	3359	48	1626	3143	158
Grp Volume(v), veh/h	226	0	0	40	20	68	91	692	725	57	827	863
Grp Sat Flow(s),veh/h/ln	1343	0	0	1115	1633	1384	1668	1664	1743	1626	1622	1679
Q Serve(g_s), s	12.7	0.0	0.0	0.0	0.9	3.6	4.6	26.3	26.3	3.0	39.7	40.4
Cycle Q Clear(g_c), s	14.0	0.0	0.0	3.4	0.9	3.6	4.6	26.3	26.3	3.0	39.7	40.4
Prop In Lane	0.49		0.44	1.00		1.00	1.00		0.03	1.00		0.09
Lane Grp Cap(c), veh/h	329	0	0	265	325	275	116	954	999	89	906	938
V/C Ratio(X)	0.69	0.00	0.00	0.15	0.06	0.25	0.79	0.73	0.73	0.64	0.91	0.92
Avail Cap(c_a), veh/h	357	0	0	288	359	304	116	962	1008	113	938	971
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.2	0.0	0.0	29.1	28.1	29.2	39.6	13.5	13.5	40.0	17.2	17.4
Incr Delay (d2), s/veh	4.9	0.0	0.0	0.3	0.1	0.5	29.1	2.7	2.6	7.7	12.8	13.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.8	0.0	0.0	0.7	0.3	1.2	2.7	8.1	8.5	1.3	14.3	15.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.2	0.0	0.0	29.4	28.2	29.7	68.7	16.2	16.1	47.8	30.0	30.8
LnGrp LOS	D	A	A	C	C	C	E	B	B	D	C	C
Approach Vol, veh/h		226			128			1508			1747	
Approach Delay, s/veh		38.2			29.3			19.3			30.9	
Approach LOS		D			C			B			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.7	54.6		22.2	11.0	53.3		22.2				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	5.0	49.0		18.0	5.0	49.0		18.0				
Max Q Clear Time (g_c+I1), s	5.0	28.3		16.0	6.6	42.4		5.6				
Green Ext Time (p_c), s	0.0	8.8		0.2	0.0	4.9		0.3				
Intersection Summary												
HCM 6th Ctrl Delay			26.5									
HCM 6th LOS			C									

Intersection						
Int Delay, s/veh	1.3					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	3	134	1297	9	80	1695
Future Vol, veh/h	3	134	1297	9	80	1695
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	200	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	32	32	9	9	12	12
Mvmt Flow	3	134	1297	9	80	1695

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2310	653	0	0	1306	0
Stage 1	1302	-	-	-	-	-
Stage 2	1008	-	-	-	-	-
Critical Hdwy	7.44	7.54	-	-	4.34	-
Critical Hdwy Stg 1	6.44	-	-	-	-	-
Critical Hdwy Stg 2	6.44	-	-	-	-	-
Follow-up Hdwy	3.82	3.62	-	-	2.32	-
Pot Cap-1 Maneuver	21	345	-	-	475	-
Stage 1	169	-	-	-	-	-
Stage 2	253	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	17	345	-	-	475	-
Mov Cap-2 Maneuver	93	-	-	-	-	-
Stage 1	169	-	-	-	-	-
Stage 2	210	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	23.8	0	0.6
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	326	475	-
HCM Lane V/C Ratio	-	-	0.42	0.168	-
HCM Control Delay (s)	-	-	23.8	14.1	-
HCM Lane LOS	-	-	C	B	-
HCM 95th %tile Q(veh)	-	-	2	0.6	-

Movement	EBL	EBR	NBU	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (veh/h)	31	161	2	102	1259	1637	55
Future Volume (veh/h)	31	161	2	102	1259	1637	55
Initial Q (Qb), veh	0	0		0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00			1.00
Parking Bus, Adj	1.00	1.00		1.00	1.00	1.00	1.00
Work Zone On Approach	No				No	No	
Adj Sat Flow, veh/h/ln	1870	1870		1870	1870	1870	1870
Adj Flow Rate, veh/h	31	161		102	1259	1637	55
Peak Hour Factor	1.00	1.00		1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2		2	2	2	2
Cap, veh/h	243	217		151	2636	2156	72
Arrive On Green	0.14	0.14		0.08	0.74	0.61	0.61
Sat Flow, veh/h	1781	1585		1781	3647	3602	118
Grp Volume(v), veh/h	31	161		102	1259	826	866
Grp Sat Flow(s),veh/h/ln	1781	1585		1781	1777	1777	1849
Q Serve(g_s), s	1.3	8.0		4.6	11.7	27.6	27.9
Cycle Q Clear(g_c), s	1.3	8.0		4.6	11.7	27.6	27.9
Prop In Lane	1.00	1.00		1.00			0.06
Lane Grp Cap(c), veh/h	243	217		151	2636	1092	1136
V/C Ratio(X)	0.13	0.74		0.68	0.48	0.76	0.76
Avail Cap(c_a), veh/h	412	366		193	2636	1092	1136
HCM Platoon Ratio	1.00	1.00		1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00		1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.2	34.1		36.6	4.2	11.4	11.5
Incr Delay (d2), s/veh	0.2	5.0		6.3	0.6	4.9	4.8
Initial Q Delay(d3),s/veh	0.0	0.0		0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.3		2.2	3.2	10.6	11.1
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	31.4	39.1		42.8	4.9	16.3	16.3
LnGrp LOS	C	D		D	A	B	B
Approach Vol, veh/h	192				1361	1692	
Approach Delay, s/veh	37.9				7.7	16.3	
Approach LOS	D				A	B	
Timer - Assigned Phs		2		4	5	6	
Phs Duration (G+Y+Rc), s		66.0		16.2	10.5	55.5	
Change Period (Y+Rc), s		6.0		6.0	4.5	6.0	
Max Green Setting (Gmax), s		60.0		18.0	7.9	47.6	
Max Q Clear Time (g_c+I1), s		13.7		10.0	6.6	29.9	
Green Ext Time (p_c), s		13.2		0.3	0.0	11.8	
Intersection Summary							
HCM 6th Ctrl Delay			14.0				
HCM 6th LOS			B				
Notes							

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	253	48	74	51	6	6	28	1080	44	22	1222	249
Future Volume (veh/h)	253	48	74	51	6	6	28	1080	44	22	1222	249
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1648	1648	1648	1826	1826	1826	1737	1737	1737	1678	1678	1678
Adj Flow Rate, veh/h	253	48	74	51	6	6	28	1080	44	22	1222	249
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	17	17	17	5	5	5	11	11	11	15	15	15
Cap, veh/h	346	130	201	216	25	20	56	2012	82	48	1635	330
Arrive On Green	0.22	0.22	0.22	0.22	0.22	0.22	0.07	1.00	1.00	0.03	0.62	0.62
Sat Flow, veh/h	1236	585	901	726	114	88	1654	3232	132	1598	2642	533
Grp Volume(v), veh/h	253	0	122	63	0	0	28	551	573	22	733	738
Grp Sat Flow(s),veh/h/ln	1236	0	1486	928	0	0	1654	1650	1713	1598	1594	1582
Q Serve(g_s), s	9.9	0.0	8.3	4.5	0.0	0.0	2.0	0.0	0.0	1.6	38.9	40.0
Cycle Q Clear(g_c), s	22.7	0.0	8.3	12.8	0.0	0.0	2.0	0.0	0.0	1.6	38.9	40.0
Prop In Lane	1.00		0.61	0.81		0.10	1.00		0.08	1.00		0.34
Lane Grp Cap(c), veh/h	346	0	331	261	0	0	56	1027	1066	48	986	979
V/C Ratio(X)	0.73	0.00	0.37	0.24	0.00	0.00	0.50	0.54	0.54	0.46	0.74	0.75
Avail Cap(c_a), veh/h	411	0	409	329	0	0	83	1027	1066	80	986	979
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.61	0.61	0.61
Uniform Delay (d), s/veh	44.9	0.0	39.5	43.8	0.0	0.0	55.0	0.0	0.0	57.2	16.1	16.4
Incr Delay (d2), s/veh	5.4	0.0	0.7	0.5	0.0	0.0	6.9	2.0	1.9	4.1	3.1	3.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.8	0.0	3.2	1.7	0.0	0.0	0.9	0.6	0.6	0.7	12.7	12.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.3	0.0	40.2	44.3	0.0	0.0	61.9	2.0	1.9	61.4	19.3	19.7
LnGrp LOS	D	A	D	D	A	A	E	A	A	E	B	B
Approach Vol, veh/h		375			63			1152			1493	
Approach Delay, s/veh		47.0			44.3			3.4			20.1	
Approach LOS		D			D			A			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.6	79.7		31.7	9.0	79.3		31.7				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	5.0	65.0		32.0	5.0	65.0		32.0				
Max Q Clear Time (g_c+I1), s	3.6	2.0		24.7	4.0	42.0		14.8				
Green Ext Time (p_c), s	0.0	7.8		1.0	0.0	10.0		0.2				

Intersection Summary			
HCM 6th Ctrl Delay			17.6
HCM 6th LOS			B

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	35	1132	7	9	1337
Future Vol, veh/h	0	35	1132	7	9	1337
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	35	1132	7	9	1337

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	570	0	0	1139	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	4.14	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	0	465	-	-	609	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	465	-	-	609	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.4	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	465	609	-
HCM Lane V/C Ratio	-	-	0.075	0.015	-
HCM Control Delay (s)	-	-	13.4	11	-
HCM Lane LOS	-	-	B	B	-
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	170	423	184	76	175	115	132	764	82	113	1039	156
Future Volume (veh/h)	170	423	184	76	175	115	132	764	82	113	1039	156
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1767	1767	1767	1604	1604	1604	1767	1767	1767	1781	1781	1781
Adj Flow Rate, veh/h	170	423	184	76	175	115	132	764	82	113	1039	156
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	9	9	9	20	20	20	9	9	9	8	8	8
Cap, veh/h	210	468	396	105	376	234	169	1264	136	147	1352	603
Arrive On Green	0.12	0.26	0.26	0.07	0.21	0.21	0.10	0.41	0.41	0.17	0.80	0.80
Sat Flow, veh/h	1682	1767	1497	1527	1803	1122	1682	3058	328	1697	3385	1510
Grp Volume(v), veh/h	170	423	184	76	146	144	132	419	427	113	1039	156
Grp Sat Flow(s),veh/h/ln	1682	1767	1497	1527	1523	1402	1682	1678	1708	1697	1692	1510
Q Serve(g_s), s	11.8	27.8	12.4	5.9	10.1	10.8	9.2	23.4	23.5	7.6	19.2	3.1
Cycle Q Clear(g_c), s	11.8	27.8	12.4	5.9	10.1	10.8	9.2	23.4	23.5	7.6	19.2	3.1
Prop In Lane	1.00		1.00	1.00		0.80	1.00		0.19	1.00		1.00
Lane Grp Cap(c), veh/h	210	468	396	105	318	292	169	694	706	147	1352	603
V/C Ratio(X)	0.81	0.90	0.46	0.73	0.46	0.49	0.78	0.60	0.60	0.77	0.77	0.26
Avail Cap(c_a), veh/h	294	501	424	115	318	292	182	694	706	156	1352	603
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.1	42.7	37.0	54.8	41.6	41.9	52.7	27.5	27.5	48.4	9.2	7.6
Incr Delay (d2), s/veh	10.9	19.1	0.8	18.6	1.0	1.3	18.1	3.9	3.8	19.5	4.2	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5	14.1	4.5	2.7	3.8	3.7	4.6	9.4	9.6	3.7	3.9	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	62.1	61.8	37.8	73.4	42.6	43.2	70.7	31.4	31.3	67.9	13.4	8.6
LnGrp LOS	E	E	D	E	D	D	E	C	C	E	B	A
Approach Vol, veh/h		777			366			978			1308	
Approach Delay, s/veh		56.2			49.2			36.7			17.6	
Approach LOS		E			D			D			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.4	54.6	13.2	36.8	17.1	52.9	20.0	30.0
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	10.0	45.0	8.0	33.0	12.0	43.0	20.0	21.0
Max Q Clear Time (g_c+I1), s	9.6	25.5	7.9	29.8	11.2	21.2	13.8	12.8
Green Ext Time (p_c), s	0.0	4.5	0.0	1.0	0.0	7.3	0.2	0.9

Intersection Summary		
HCM 6th Ctrl Delay		35.1
HCM 6th LOS		D

Intersection	
Int Delay, s/veh	6.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	54	103	73	41	59	12
Future Vol, veh/h	54	103	73	41	59	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	50	50	50	50	50	50
Mvmt Flow	54	103	73	41	59	12

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	224	94	0	0	114	0
Stage 1	94	-	-	-	-	-
Stage 2	130	-	-	-	-	-
Critical Hdwy	6.9	6.7	-	-	4.6	-
Critical Hdwy Stg 1	5.9	-	-	-	-	-
Critical Hdwy Stg 2	5.9	-	-	-	-	-
Follow-up Hdwy	3.95	3.75	-	-	2.65	-
Pot Cap-1 Maneuver	669	846	-	-	1224	-
Stage 1	822	-	-	-	-	-
Stage 2	790	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	636	846	-	-	1224	-
Mov Cap-2 Maneuver	636	-	-	-	-	-
Stage 1	822	-	-	-	-	-
Stage 2	751	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11	0	6.7
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	760	1224	-
HCM Lane V/C Ratio	-	-	0.207	0.048	-
HCM Control Delay (s)	-	-	11	8.1	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.8	0.2	-

Intersection	
Int Delay, s/veh	3.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	275	146	75	208	81	94
Future Vol, veh/h	275	146	75	208	81	94
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	200	-	200	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	275	146	75	208	81	94

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	421	0	706	348
Stage 1	-	-	-	-	348	-
Stage 2	-	-	-	-	358	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1138	-	402	695
Stage 1	-	-	-	-	715	-
Stage 2	-	-	-	-	707	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1138	-	375	695
Mov Cap-2 Maneuver	-	-	-	-	484	-
Stage 1	-	-	-	-	715	-
Stage 2	-	-	-	-	660	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.2	12.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	484	695	-	-	1138	-
HCM Lane V/C Ratio	0.167	0.135	-	-	0.066	-
HCM Control Delay (s)	13.9	11	-	-	8.4	-
HCM Lane LOS	B	B	-	-	A	-
HCM 95th %tile Q(veh)	0.6	0.5	-	-	0.2	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	192	601	214	177	38	405	754	197	65	1255	30
Future Volume (veh/h)	38	192	601	214	177	38	405	754	197	65	1255	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	38	192	601	214	177	38	405	754	197	65	1255	30
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	80	750	564	218	1024	457	499	1563	404	103	1539	37
Arrive On Green	0.05	0.21	0.21	0.12	0.29	0.29	0.14	0.39	0.39	0.06	0.30	0.30
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	3456	4041	1045	1781	5130	123
Grp Volume(v), veh/h	38	192	601	214	177	38	405	634	317	65	833	452
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1728	1702	1682	1781	1702	1848
Q Serve(g_s), s	1.9	4.1	19.0	10.8	3.4	1.6	10.2	12.6	12.8	3.2	20.4	20.4
Cycle Q Clear(g_c), s	1.9	4.1	19.0	10.8	3.4	1.6	10.2	12.6	12.8	3.2	20.4	20.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.62	1.00		0.07
Lane Grp Cap(c), veh/h	80	750	564	218	1024	457	499	1316	650	103	1021	554
V/C Ratio(X)	0.47	0.26	1.07	0.98	0.17	0.08	0.81	0.48	0.49	0.63	0.82	0.82
Avail Cap(c_a), veh/h	119	750	564	218	1024	457	499	1316	650	158	1021	554
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.9	29.6	29.0	39.4	24.0	23.4	37.3	20.8	20.9	41.5	29.2	29.2
Incr Delay (d2), s/veh	4.2	0.2	56.8	55.9	0.1	0.1	9.8	1.3	2.6	6.2	7.2	12.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	1.7	20.5	8.0	1.4	0.6	4.9	5.1	5.3	1.6	9.1	10.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.2	29.8	85.8	95.4	24.1	23.4	47.1	22.1	23.5	47.7	36.4	41.7
LnGrp LOS	D	C	F	F	C	C	D	C	C	D	D	D
Approach Vol, veh/h		831			429			1356			1350	
Approach Delay, s/veh		71.1			59.6			29.9			38.7	
Approach LOS		E			E			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.2	39.8	16.0	24.0	18.0	32.0	9.1	30.9
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	7.0	31.0	10.0	18.0	12.0	26.0	5.0	23.0
Max Q Clear Time (g_c+I1), s	5.2	14.8	12.8	21.0	12.2	22.4	3.9	5.4
Green Ext Time (p_c), s	0.0	5.9	0.0	0.0	0.0	2.5	0.0	1.1

Intersection Summary	
HCM 6th Ctrl Delay	44.7
HCM 6th LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	790	5	419	585	1111	0	0	1226	588
Future Volume (veh/h)	0	0	0	790	5	419	585	1111	0	0	1226	588
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1737	1737	1737	1678	1678	0	0	1870	1870
Adj Flow Rate, veh/h				922	0	281	585	1111	0	0	1226	588
Peak Hour Factor				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %				11	11	11	15	15	0	0	2	2
Cap, veh/h				1055	0	469	685	2600	0	0	1865	460
Arrive On Green				0.32	0.00	0.32	0.22	0.57	0.00	0.00	0.29	0.29
Sat Flow, veh/h				3309	0	1472	3100	4731	0	0	6696	1585
Grp Volume(v), veh/h				922	0	281	585	1111	0	0	1226	588
Grp Sat Flow(s),veh/h/ln				1654	0	1472	1550	1527	0	0	1609	1585
Q Serve(g_s), s				23.2	0.0	14.2	16.0	12.2	0.0	0.0	14.7	25.5
Cycle Q Clear(g_c), s				23.2	0.0	14.2	16.0	12.2	0.0	0.0	14.7	25.5
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				1055	0	469	685	2600	0	0	1865	460
V/C Ratio(X)				0.87	0.00	0.60	0.85	0.43	0.00	0.00	0.66	1.28
Avail Cap(c_a), veh/h				1127	0	501	739	2600	0	0	1865	460
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				28.3	0.0	25.3	32.9	10.9	0.0	0.0	27.4	31.3
Incr Delay (d2), s/veh				7.5	0.0	1.8	9.1	0.5	0.0	0.0	1.8	141.7
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				9.9	0.0	5.0	6.3	3.3	0.0	0.0	5.3	26.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				35.8	0.0	27.0	42.0	11.4	0.0	0.0	29.3	173.0
LnGrp LOS				D	A	C	D	B	A	A	C	F
Approach Vol, veh/h					1203			1696			1814	
Approach Delay, s/veh					33.8			21.9			75.9	
Approach LOS					C			C			E	

Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		55.0			24.5	30.5		33.1				
Change Period (Y+Rc), s		6.0			6.0	6.0		6.0				
Max Green Setting (Gmax), s		49.0			20.0	23.0		29.0				
Max Q Clear Time (g_c+I1), s		14.2			18.0	27.5		25.2				
Green Ext Time (p_c), s		8.2			0.5	0.0		1.9				

Intersection Summary			
HCM 6th Ctrl Delay			45.7
HCM 6th LOS			D

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	379	8	715	0	0	0	0	1314	673	426	1593	0
Future Volume (veh/h)	379	8	715	0	0	0	0	1314	673	426	1593	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1693	1693	1693				0	1574	1574	1796	1796	0
Adj Flow Rate, veh/h	255	0	853				0	1314	673	426	1593	0
Peak Hour Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	14	14	14				0	22	22	7	7	0
Cap, veh/h	430	0	765				0	1241	578	443	2124	0
Arrive On Green	0.27	0.00	0.27				0.00	0.43	0.43	0.13	0.62	0.00
Sat Flow, veh/h	1612	0	2869				0	3006	1334	3319	3503	0
Grp Volume(v), veh/h	255	0	853				0	1314	673	426	1593	0
Grp Sat Flow(s),veh/h/ln	1612	0	1434				0	1432	1334	1659	1706	0
Q Serve(g_s), s	12.4	0.0	24.0				0.0	39.0	39.0	11.5	29.8	0.0
Cycle Q Clear(g_c), s	12.4	0.0	24.0				0.0	39.0	39.0	11.5	29.8	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	430	0	765				0	1241	578	443	2124	0
V/C Ratio(X)	0.59	0.00	1.12				0.00	1.06	1.16	0.96	0.75	0.00
Avail Cap(c_a), veh/h	430	0	765				0	1241	578	443	2124	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	28.7	0.0	33.0				0.0	25.5	25.5	38.8	12.0	0.0
Incr Delay (d2), s/veh	2.2	0.0	68.9				0.0	42.6	91.7	33.2	2.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.9	0.0	15.4				0.0	18.4	25.1	6.3	8.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.9	0.0	101.9				0.0	68.1	117.2	72.0	14.5	0.0
LnGrp LOS	C	A	F				A	F	F	E	B	A
Approach Vol, veh/h		1108						1987			2019	
Approach Delay, s/veh		85.6						84.7			26.7	
Approach LOS		F						F			C	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	17.0	44.0		29.0		61.0						
Change Period (Y+Rc), s	6.0	6.0		6.0		6.0						
Max Green Setting (Gmax), s	11.0	38.0		23.0		55.0						
Max Q Clear Time (g_c+I1), s	13.5	41.0		26.0		31.8						
Green Ext Time (p_c), s	0.0	0.0		0.0		11.9						
Intersection Summary												
HCM 6th Ctrl Delay			62.0									
HCM 6th LOS			E									

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	424	21	130	33	29	61	140	1433	30	44	1678	569
Future Volume (veh/h)	424	21	130	33	29	61	140	1433	30	44	1678	569
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1693	1693	1693	1455	1455	1455	1500	1500	1500	1722	1722	1722
Adj Flow Rate, veh/h	424	21	130	33	29	61	140	1433	30	44	1678	569
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	14	14	14	30	30	30	27	27	27	12	12	12
Cap, veh/h	350	451	382	328	369	329	111	1480	31	79	1191	382
Arrive On Green	0.27	0.27	0.27	0.27	0.27	0.27	0.08	0.52	0.52	0.05	0.49	0.49
Sat Flow, veh/h	1182	1693	1434	962	1383	1233	1428	2854	60	1640	2437	781
Grp Volume(v), veh/h	424	21	130	33	29	61	140	715	748	44	1095	1152
Grp Sat Flow(s),veh/h/ln	1182	1693	1434	962	1383	1233	1428	1425	1489	1640	1636	1582
Q Serve(g_s), s	20.6	0.8	6.6	2.4	1.4	3.4	7.0	43.6	43.8	2.4	44.0	44.0
Cycle Q Clear(g_c), s	24.0	0.8	6.6	3.2	1.4	3.4	7.0	43.6	43.8	2.4	44.0	44.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.04	1.00		0.49
Lane Grp Cap(c), veh/h	350	451	382	328	369	329	111	739	772	79	800	773
V/C Ratio(X)	1.21	0.05	0.34	0.10	0.08	0.19	1.26	0.97	0.97	0.56	1.37	1.49
Avail Cap(c_a), veh/h	350	451	382	328	369	329	111	739	772	109	800	773
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.1	24.5	26.6	25.7	24.7	25.5	41.5	20.9	21.0	41.9	23.0	23.0
Incr Delay (d2), s/veh	118.5	0.0	0.5	0.1	0.1	0.3	170.8	25.2	24.9	6.0	173.9	227.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	19.0	0.3	2.2	0.5	0.4	1.0	7.6	16.7	17.4	1.0	52.4	62.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	155.5	24.5	27.1	25.8	24.8	25.7	212.3	46.2	45.9	47.9	196.9	250.5
LnGrp LOS	F	C	C	C	C	C	F	D	D	D	F	F
Approach Vol, veh/h		575			123			1603			2291	
Approach Delay, s/veh		121.7			25.5			60.6			221.0	
Approach LOS		F			C			E			F	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.3	51.7		29.0	12.0	49.0		29.0
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0
Max Green Setting (Gmax), s	5.0	44.0		23.0	6.0	43.0		23.0
Max Q Clear Time (g_c+I1), s	4.4	45.8		26.0	9.0	46.0		5.4
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	0.0		0.5

Intersection Summary	
HCM 6th Ctrl Delay	147.3
HCM 6th LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	349	79	122	55	74	125	99	1170	61	240	1243	295
Future Volume (veh/h)	349	79	122	55	74	125	99	1170	61	240	1243	295
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1411	1411	1411	625	625	625	1574	1574	1574	1678	1678	1678
Adj Flow Rate, veh/h	349	79	122	55	74	125	99	1170	61	240	1243	295
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	33	33	33	86	86	86	22	22	22	15	15	15
Cap, veh/h	252	42	65	230	236	200	100	996	52	178	997	233
Arrive On Green	0.38	0.38	0.38	0.38	0.38	0.38	0.07	0.34	0.34	0.11	0.39	0.39
Sat Flow, veh/h	495	112	173	395	625	530	1499	2891	151	1598	2563	600
Grp Volume(v), veh/h	550	0	0	55	74	125	99	605	626	240	766	772
Grp Sat Flow(s),veh/h/ln	781	0	0	395	625	530	1499	1495	1547	1598	1594	1570
Q Serve(g_s), s	26.5	0.0	0.0	0.0	7.5	17.3	5.9	31.0	31.0	10.0	35.0	35.0
Cycle Q Clear(g_c), s	34.0	0.0	0.0	9.0	7.5	17.3	5.9	31.0	31.0	10.0	35.0	35.0
Prop In Lane	0.63		0.22	1.00		1.00	1.00		0.10	1.00		0.38
Lane Grp Cap(c), veh/h	360	0	0	230	236	200	100	515	533	178	620	610
V/C Ratio(X)	1.53	0.00	0.00	0.24	0.31	0.62	0.99	1.17	1.18	1.35	1.24	1.26
Avail Cap(c_a), veh/h	360	0	0	230	236	200	100	515	533	178	620	610
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.2	0.0	0.0	20.2	19.8	22.8	42.0	29.5	29.5	40.0	27.5	27.5
Incr Delay (d2), s/veh	250.7	0.0	0.0	0.5	0.7	5.9	86.9	97.3	97.3	190.7	119.9	131.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	32.9	0.0	0.0	0.8	1.1	2.3	4.5	23.6	24.5	13.0	32.1	33.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	284.9	0.0	0.0	20.8	20.5	28.7	128.8	126.8	126.8	230.7	147.4	159.0
LnGrp LOS	F	A	A	C	C	C	F	F	F	F	F	F
Approach Vol, veh/h		550			254			1330			1778	
Approach Delay, s/veh		284.9			24.6			127.0			163.7	
Approach LOS		F			C			F			F	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	15.0	36.0		39.0	11.0	40.0		39.0				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	9.0	30.0		33.0	5.0	34.0		33.0				
Max Q Clear Time (g_c+I1), s	12.0	33.0		36.0	7.9	37.0		19.3				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	0.0		1.4				

Intersection Summary			
HCM 6th Ctrl Delay			159.2
HCM 6th LOS			F

Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	52	1157	7	69	1273
Future Vol, veh/h	0	52	1157	7	69	1273
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	200	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	59	59	20	20	15	15
Mvmt Flow	0	52	1157	7	69	1273

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1936	582	0	0	1164	0
Stage 1	1161	-	-	-	-	-
Stage 2	775	-	-	-	-	-
Critical Hdwy	7.98	8.08	-	-	4.4	-
Critical Hdwy Stg 1	6.98	-	-	-	-	-
Critical Hdwy Stg 2	6.98	-	-	-	-	-
Follow-up Hdwy	4.09	3.89	-	-	2.35	-
Pot Cap-1 Maneuver	30	338	-	-	527	-
Stage 1	167	-	-	-	-	-
Stage 2	295	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	26	338	-	-	527	-
Mov Cap-2 Maneuver	104	-	-	-	-	-
Stage 1	167	-	-	-	-	-
Stage 2	256	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	17.6	0	0.7
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	338	527	-
HCM Lane V/C Ratio	-	-	0.154	0.131	-
HCM Control Delay (s)	-	-	17.6	12.9	-
HCM Lane LOS	-	-	C	B	-
HCM 95th %tile Q(veh)	-	-	0.5	0.4	-

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	59	141	80	1136	1258	79
Future Volume (veh/h)	59	141	80	1136	1258	79
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	59	141	80	1136	1258	79
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	376	335	178	2409	1773	111
Arrive On Green	0.21	0.21	0.10	0.68	0.52	0.52
Sat Flow, veh/h	1781	1585	1781	3647	3489	213
Grp Volume(v), veh/h	59	141	80	1136	657	680
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1777	1777	1832
Q Serve(g_s), s	2.4	6.9	3.8	13.6	25.2	25.4
Cycle Q Clear(g_c), s	2.4	6.9	3.8	13.6	25.2	25.4
Prop In Lane	1.00	1.00	1.00			0.12
Lane Grp Cap(c), veh/h	376	335	178	2409	928	957
V/C Ratio(X)	0.16	0.42	0.45	0.47	0.71	0.71
Avail Cap(c_a), veh/h	376	335	178	2409	928	957
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.0	30.7	38.2	6.9	16.3	16.3
Incr Delay (d2), s/veh	0.9	3.9	8.0	0.7	4.6	4.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	6.7	2.0	4.5	10.6	11.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	29.9	34.6	46.1	7.5	20.9	20.8
LnGrp LOS	C	C	D	A	C	C
Approach Vol, veh/h	200			1216	1337	
Approach Delay, s/veh	33.2			10.1	20.8	
Approach LOS	C			B	C	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		66.0		24.0	14.0	52.0
Change Period (Y+Rc), s		6.0		6.0	6.0	6.0
Max Green Setting (Gmax), s		60.0		18.0	8.0	46.0
Max Q Clear Time (g_c+I1), s		15.6		8.9	5.8	27.4
Green Ext Time (p_c), s		11.2		0.4	0.0	9.3
Intersection Summary						
HCM 6th Ctrl Delay			17.0			
HCM 6th LOS			B			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	204	40	29	15	3	5	34	1024	24	8	1270	250
Future Volume (veh/h)	204	40	29	15	3	5	34	1024	24	8	1270	250
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1337	1337	1337	1085	1085	1085	1633	1633	1633	1633	1633	1633
Adj Flow Rate, veh/h	204	40	29	15	3	5	34	1024	24	8	1270	250
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	38	38	38	55	55	55	18	18	18	18	18	18
Cap, veh/h	288	163	118	148	27	35	57	1954	46	28	1585	309
Arrive On Green	0.23	0.23	0.23	0.23	0.23	0.23	0.07	1.00	1.00	0.02	0.61	0.61
Sat Flow, veh/h	1006	720	522	434	119	154	1555	3099	73	1555	2590	504
Grp Volume(v), veh/h	204	0	69	23	0	0	34	513	535	8	756	764
Grp Sat Flow(s),veh/h/ln	1006	0	1243	706	0	0	1555	1552	1620	1555	1552	1542
Q Serve(g_s), s	16.7	0.0	5.5	1.4	0.0	0.0	2.5	0.0	0.0	0.6	44.2	45.8
Cycle Q Clear(g_c), s	23.6	0.0	5.5	6.9	0.0	0.0	2.5	0.0	0.0	0.6	44.2	45.8
Prop In Lane	1.00		0.42	0.65		0.22	1.00		0.04	1.00		0.33
Lane Grp Cap(c), veh/h	288	0	281	210	0	0	57	978	1022	28	950	944
V/C Ratio(X)	0.71	0.00	0.25	0.11	0.00	0.00	0.60	0.52	0.52	0.28	0.80	0.81
Avail Cap(c_a), veh/h	320	0	321	236	0	0	78	978	1022	78	950	944
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.66	0.66	0.66
Uniform Delay (d), s/veh	45.0	0.0	38.0	38.6	0.0	0.0	54.8	0.0	0.0	58.1	17.6	17.9
Incr Delay (d2), s/veh	6.3	0.0	0.4	0.2	0.0	0.0	9.6	2.0	1.9	3.6	4.6	5.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.4	0.0	1.7	0.6	0.0	0.0	1.1	0.5	0.5	0.3	14.4	14.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.3	0.0	38.5	38.8	0.0	0.0	64.4	2.0	1.9	61.7	22.2	23.0
LnGrp LOS	D	A	D	D	A	A	E	A	A	E	C	C
Approach Vol, veh/h		273			23			1082			1528	
Approach Delay, s/veh		48.1			38.8			3.9			22.8	
Approach LOS		D			D			A			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.2	80.7		32.2	9.4	78.4		32.2				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	5.0	67.0		30.0	5.0	67.0		30.0				
Max Q Clear Time (g_c+I1), s	2.6	2.0		25.6	4.5	47.8		8.9				
Green Ext Time (p_c), s	0.0	7.1		0.6	0.0	9.6		0.1				
Intersection Summary												
HCM 6th Ctrl Delay			18.3									
HCM 6th LOS			B									

Intersection						
Int Delay, s/veh	0.2					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	11	1076	17	21	1293
Future Vol, veh/h	0	11	1076	17	21	1293
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	11	1076	17	21	1293

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	547	0	0	1093	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	4.14	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	0	481	-	-	634	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	481	-	-	634	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.7	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	481	634	-
HCM Lane V/C Ratio	-	-	0.023	0.033	-
HCM Control Delay (s)	-	-	12.7	10.9	-
HCM Lane LOS	-	-	B	B	-
HCM 95th %tile Q(veh)	-	-	0.1	0.1	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	145	99	78	100	290	83	131	749	37	53	990	154
Future Volume (veh/h)	145	99	78	100	290	83	131	749	37	53	990	154
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1604	1604	1604	1678	1678	1678	1693	1693	1693	1737	1737	1737
Adj Flow Rate, veh/h	145	99	78	100	290	83	131	749	37	53	990	154
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	20	20	20	15	15	15	14	14	14	11	11	11
Cap, veh/h	180	287	243	134	357	100	167	1629	80	79	1540	687
Arrive On Green	0.12	0.18	0.18	0.08	0.15	0.15	0.10	0.52	0.52	0.10	0.93	0.93
Sat Flow, veh/h	1527	1604	1359	1598	2457	690	1612	3119	154	1654	3300	1472
Grp Volume(v), veh/h	145	99	78	100	186	187	131	386	400	53	990	154
Grp Sat Flow(s),veh/h/ln	1527	1604	1359	1598	1594	1553	1612	1608	1665	1654	1650	1472
Q Serve(g_s), s	11.1	6.5	6.0	7.3	13.6	14.0	9.5	18.1	18.1	3.7	6.0	1.1
Cycle Q Clear(g_c), s	11.1	6.5	6.0	7.3	13.6	14.0	9.5	18.1	18.1	3.7	6.0	1.1
Prop In Lane	1.00		1.00	1.00		0.44	1.00		0.09	1.00		1.00
Lane Grp Cap(c), veh/h	180	287	243	134	231	225	167	840	870	79	1540	687
V/C Ratio(X)	0.81	0.34	0.32	0.75	0.81	0.83	0.78	0.46	0.46	0.67	0.64	0.22
Avail Cap(c_a), veh/h	242	321	272	186	252	246	215	840	870	124	1540	687
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.6	43.1	42.9	53.7	49.6	49.8	52.5	18.0	18.0	53.3	2.3	2.2
Incr Delay (d2), s/veh	13.4	0.7	0.8	9.9	16.0	19.2	13.3	1.8	1.7	9.3	2.1	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.8	2.6	2.0	3.2	6.3	6.5	4.3	6.5	6.7	1.6	1.3	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	65.0	43.8	43.6	63.6	65.7	69.1	65.7	19.8	19.8	62.7	4.4	2.9
LnGrp LOS	E	D	D	E	E	E	E	B	B	E	A	A
Approach Vol, veh/h		322			473			917			1197	
Approach Delay, s/veh		53.3			66.6			26.3			6.8	
Approach LOS		D			E			C			A	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.7	67.7	15.1	26.5	17.5	61.0	19.1	22.4
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	8.0	52.0	13.0	23.0	15.0	45.0	18.0	18.0
Max Q Clear Time (g_c+I1), s	5.7	20.1	9.3	8.5	11.5	8.0	13.1	16.0
Green Ext Time (p_c), s	0.0	4.5	0.1	0.6	0.1	7.9	0.1	0.4

Intersection Summary	
HCM 6th Ctrl Delay	27.8
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	2.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	4	5	31	40	34	19
Future Vol, veh/h	4	5	31	40	34	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	50	50	50	50	50	50
Mvmt Flow	4	5	31	40	34	19

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	138	51	0	0	71	0
Stage 1	51	-	-	-	-	-
Stage 2	87	-	-	-	-	-
Critical Hdwy	6.9	6.7	-	-	4.6	-
Critical Hdwy Stg 1	5.9	-	-	-	-	-
Critical Hdwy Stg 2	5.9	-	-	-	-	-
Follow-up Hdwy	3.95	3.75	-	-	2.65	-
Pot Cap-1 Maneuver	754	896	-	-	1273	-
Stage 1	862	-	-	-	-	-
Stage 2	829	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	734	896	-	-	1273	-
Mov Cap-2 Maneuver	734	-	-	-	-	-
Stage 1	862	-	-	-	-	-
Stage 2	807	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.5	0	5.1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	816	1273	-
HCM Lane V/C Ratio	-	-	0.011	0.027	-
HCM Control Delay (s)	-	-	9.5	7.9	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0.1	-

Intersection	
Int Delay, s/veh	4.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	181	73	72	215	134	69
Future Vol, veh/h	181	73	72	215	134	69
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	200	-	200	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	181	73	72	215	134	69

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	254	0	577	218
Stage 1	-	-	-	-	218	-
Stage 2	-	-	-	-	359	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1311	-	478	822
Stage 1	-	-	-	-	818	-
Stage 2	-	-	-	-	707	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1311	-	452	822
Mov Cap-2 Maneuver	-	-	-	-	537	-
Stage 1	-	-	-	-	818	-
Stage 2	-	-	-	-	668	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2	12.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	537	822	-	-	1311	-
HCM Lane V/C Ratio	0.25	0.084	-	-	0.055	-
HCM Control Delay (s)	13.9	9.8	-	-	7.9	-
HCM Lane LOS	B	A	-	-	A	-
HCM 95th %tile Q(veh)	1	0.3	-	-	0.2	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	98	263	526	226	306	131	620	1374	231	85	918	61
Future Volume (veh/h)	98	263	526	226	306	131	620	1374	231	85	918	61
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	98	263	526	226	306	131	620	1374	231	85	918	61
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	144	750	634	257	977	436	653	1565	263	119	1141	76
Arrive On Green	0.08	0.21	0.21	0.14	0.27	0.27	0.19	0.36	0.36	0.07	0.23	0.23
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	3456	4402	740	1781	4892	324
Grp Volume(v), veh/h	98	263	526	226	306	131	620	1062	543	85	638	341
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1728	1702	1737	1781	1702	1812
Q Serve(g_s), s	4.8	5.7	19.0	11.2	6.1	5.9	16.0	26.3	26.3	4.2	15.9	16.0
Cycle Q Clear(g_c), s	4.8	5.7	19.0	11.2	6.1	5.9	16.0	26.3	26.3	4.2	15.9	16.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.43	1.00		0.18
Lane Grp Cap(c), veh/h	144	750	634	257	977	436	653	1210	618	119	794	423
V/C Ratio(X)	0.68	0.35	0.83	0.88	0.31	0.30	0.95	0.88	0.88	0.72	0.80	0.81
Avail Cap(c_a), veh/h	198	750	634	257	977	436	653	1210	618	119	794	423
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.2	30.2	24.2	37.7	25.9	25.8	36.1	27.2	27.2	41.2	32.6	32.6
Incr Delay (d2), s/veh	5.6	0.3	9.1	27.3	0.2	0.4	23.5	9.2	16.2	18.5	8.5	15.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	2.4	11.1	6.7	2.6	2.2	8.7	11.7	13.2	2.4	7.3	8.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.8	30.5	33.3	65.0	26.1	26.2	59.6	36.3	43.4	59.7	41.0	47.7
LnGrp LOS	D	C	C	E	C	C	E	D	D	E	D	D
Approach Vol, veh/h		887			663			2225			1064	
Approach Delay, s/veh		33.9			39.4			44.5			44.6	
Approach LOS		C			D			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.0	37.0	18.0	24.0	22.0	26.0	12.3	29.7				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	5.0	31.0	12.0	18.0	16.0	20.0	9.0	21.0				
Max Q Clear Time (g_c+I1), s	6.2	28.3	13.2	21.0	18.0	18.0	6.8	8.1				
Green Ext Time (p_c), s	0.0	2.2	0.0	0.0	0.0	1.2	0.0	2.0				
Intersection Summary												
HCM 6th Ctrl Delay			41.9									
HCM 6th LOS			D									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	847	3	535	546	1762	0	0	1340	448
Future Volume (veh/h)	0	0	0	847	3	535	546	1762	0	0	1340	448
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1752	1752	1752	1841	1841	0	0	1856	1856
Adj Flow Rate, veh/h				1015	0	358	546	1762	0	0	1340	448
Peak Hour Factor				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %				10	10	10	4	4	0	0	3	3
Cap, veh/h				1181	0	525	657	2667	0	0	1786	440
Arrive On Green				0.35	0.00	0.35	0.19	0.53	0.00	0.00	0.28	0.28
Sat Flow, veh/h				3337	0	1485	3401	5191	0	0	6643	1572
Grp Volume(v), veh/h				1015	0	358	546	1762	0	0	1340	448
Grp Sat Flow(s),veh/h/ln				1668	0	1485	1700	1675	0	0	1596	1572
Q Serve(g_s), s				24.5	0.0	17.8	13.4	22.0	0.0	0.0	16.6	24.2
Cycle Q Clear(g_c), s				24.5	0.0	17.8	13.4	22.0	0.0	0.0	16.6	24.2
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				1181	0	525	657	2667	0	0	1786	440
V/C Ratio(X)				0.86	0.00	0.68	0.83	0.66	0.00	0.00	0.75	1.02
Avail Cap(c_a), veh/h				1309	0	582	706	2667	0	0	1786	440
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				26.0	0.0	23.8	33.6	14.7	0.0	0.0	28.5	31.2
Incr Delay (d2), s/veh				5.6	0.0	2.8	7.8	1.3	0.0	0.0	3.0	47.7
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				10.1	0.0	6.4	5.7	6.9	0.0	0.0	6.0	14.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				31.5	0.0	26.7	41.5	16.0	0.0	0.0	31.4	78.9
LnGrp LOS				C	A	C	D	B	A	A	C	F
Approach Vol, veh/h					1373			2308			1788	
Approach Delay, s/veh					30.3			22.0			43.3	
Approach LOS					C			C			D	

Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		51.0			21.8	29.2		35.7				
Change Period (Y+Rc), s		6.0			6.0	6.0		6.0				
Max Green Setting (Gmax), s		45.0			17.0	22.0		33.0				
Max Q Clear Time (g_c+I1), s		24.0			15.4	26.2		26.5				
Green Ext Time (p_c), s		12.0			0.4	0.0		3.2				

Intersection Summary			
HCM 6th Ctrl Delay			31.1
HCM 6th LOS			C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	632	0	674	0	0	0	0	1703	872	511	1715	0
Future Volume (veh/h)	632	0	674	0	0	0	0	1703	872	511	1715	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1767	1767	1767				0	1781	1781	1796	1796	0
Adj Flow Rate, veh/h	848	0	442				0	1703	872	511	1715	0
Peak Hour Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	9	9	9				0	8	8	7	7	0
Cap, veh/h	823	0	366				0	1513	705	406	2199	0
Arrive On Green	0.24	0.00	0.24				0.00	0.47	0.47	0.12	0.64	0.00
Sat Flow, veh/h	3365	0	1497				0	3403	1510	3319	3503	0
Grp Volume(v), veh/h	848	0	442				0	1703	872	511	1715	0
Grp Sat Flow(s),veh/h/ln	1682	0	1497				0	1621	1510	1659	1706	0
Q Serve(g_s), s	22.0	0.0	22.0				0.0	42.0	42.0	11.0	32.3	0.0
Cycle Q Clear(g_c), s	22.0	0.0	22.0				0.0	42.0	42.0	11.0	32.3	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	823	0	366				0	1513	705	406	2199	0
V/C Ratio(X)	1.03	0.00	1.21				0.00	1.13	1.24	1.26	0.78	0.00
Avail Cap(c_a), veh/h	823	0	366				0	1513	705	406	2199	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	34.0	0.0	34.0				0.0	24.0	24.0	39.5	11.4	0.0
Incr Delay (d2), s/veh	39.6	0.0	116.4				0.0	65.7	118.9	135.5	2.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.2	0.0	19.6				0.0	27.0	35.6	11.8	9.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	73.6	0.0	150.4				0.0	89.7	142.9	175.0	14.3	0.0
LnGrp LOS	F	A	F				A	F	F	F	B	A
Approach Vol, veh/h		1290						2575			2226	
Approach Delay, s/veh		99.9						107.7			51.1	
Approach LOS		F						F			D	

Timer - Assigned Phs	1	2	4	6
Phs Duration (G+Y+Rc), s	16.0	47.0	27.0	63.0
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	10.0	41.0	21.0	57.0
Max Q Clear Time (g_c+I1), s	13.0	44.0	24.0	34.3
Green Ext Time (p_c), s	0.0	0.0	0.0	12.8

Intersection Summary	
HCM 6th Ctrl Delay	85.4
HCM 6th LOS	F

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	566	124	207	35	31	82	81	1768	26	58	1906	422
Future Volume (veh/h)	566	124	207	35	31	82	81	1768	26	58	1906	422
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1411	1411	1411	1767	1767	1767	1707	1707	1707
Adj Flow Rate, veh/h	566	124	207	35	31	82	81	1768	26	58	1906	422
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	7	7	7	33	33	33	9	9	9	13	13	13
Cap, veh/h	415	579	491	295	432	385	112	1545	23	89	1182	252
Arrive On Green	0.32	0.32	0.32	0.32	0.32	0.32	0.07	0.46	0.46	0.05	0.44	0.44
Sat Flow, veh/h	1229	1796	1522	791	1340	1196	1682	3386	50	1626	2660	567
Grp Volume(v), veh/h	566	124	207	35	31	82	81	875	919	58	1134	1194
Grp Sat Flow(s),veh/h/ln	1229	1796	1522	791	1340	1196	1682	1678	1758	1626	1622	1605
Q Serve(g_s), s	24.5	4.5	9.6	3.0	1.4	4.5	4.2	41.1	41.1	3.1	40.0	40.0
Cycle Q Clear(g_c), s	29.0	4.5	9.6	7.6	1.4	4.5	4.2	41.1	41.1	3.1	40.0	40.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.03	1.00		0.35
Lane Grp Cap(c), veh/h	415	579	491	295	432	385	112	766	802	89	721	713
V/C Ratio(X)	1.36	0.21	0.42	0.12	0.07	0.21	0.72	1.14	1.15	0.65	1.57	1.67
Avail Cap(c_a), veh/h	415	579	491	295	432	385	112	766	802	108	721	713
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.1	22.2	23.9	25.0	21.2	22.2	41.2	24.5	24.5	41.7	25.0	25.0
Incr Delay (d2), s/veh	179.1	0.2	0.6	0.2	0.1	0.3	20.3	79.3	80.3	9.6	264.7	309.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	29.5	1.8	3.3	0.6	0.4	1.2	2.3	30.4	32.1	1.4	65.8	73.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	214.2	22.4	24.5	25.1	21.2	22.5	61.4	103.8	104.8	51.3	289.7	334.2
LnGrp LOS	F	C	C	C	C	C	E	F	F	D	F	F
Approach Vol, veh/h		897			148			1875			2386	
Approach Delay, s/veh		143.9			22.8			102.4			306.1	
Approach LOS		F			C			F			F	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.9	46.1		34.0	11.0	45.0		34.0				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	5.0	39.0		28.0	5.0	39.0		28.0				
Max Q Clear Time (g_c+I1), s	5.1	43.1		31.0	6.2	42.0		9.6				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	0.0		0.7				
Intersection Summary												
HCM 6th Ctrl Delay			198.8									
HCM 6th LOS			F									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	252	34	146	67	20	117	100	1477	41	185	1675	246
Future Volume (veh/h)	252	34	146	67	20	117	100	1477	41	185	1675	246
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1707	1707	1707	1633	1633	1633	1752	1752	1752	1707	1707	1707
Adj Flow Rate, veh/h	252	34	146	67	20	117	100	1477	41	185	1675	246
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	13	13	13	18	18	18	10	10	10	13	13	13
Cap, veh/h	245	25	105	324	417	354	111	1507	42	199	1455	209
Arrive On Green	0.26	0.26	0.26	0.26	0.26	0.26	0.07	0.46	0.46	0.12	0.51	0.51
Sat Flow, veh/h	712	96	412	1051	1633	1384	1668	3308	92	1626	2847	408
Grp Volume(v), veh/h	432	0	0	67	20	117	100	742	776	185	937	984
Grp Sat Flow(s),veh/h/ln	1220	0	0	1051	1633	1384	1668	1664	1735	1626	1622	1634
Q Serve(g_s), s	22.2	0.0	0.0	0.0	0.8	6.2	5.4	39.4	39.6	10.1	46.0	46.0
Cycle Q Clear(g_c), s	23.0	0.0	0.0	5.0	0.8	6.2	5.4	39.4	39.6	10.1	46.0	46.0
Prop In Lane	0.58		0.34	1.00		1.00	1.00		0.05	1.00		0.25
Lane Grp Cap(c), veh/h	375	0	0	324	417	354	111	758	791	199	829	835
V/C Ratio(X)	1.15	0.00	0.00	0.21	0.05	0.33	0.90	0.98	0.98	0.93	1.13	1.18
Avail Cap(c_a), veh/h	375	0	0	324	417	354	111	758	791	199	829	835
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.8	0.0	0.0	26.8	25.2	27.2	41.7	24.1	24.1	39.1	22.0	22.0
Incr Delay (d2), s/veh	94.5	0.0	0.0	0.3	0.0	0.5	54.9	27.4	27.4	44.7	73.6	92.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	18.0	0.0	0.0	1.1	0.3	2.0	3.8	18.6	19.5	6.2	30.9	35.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	130.3	0.0	0.0	27.1	25.3	27.8	96.6	51.4	51.5	83.8	95.6	114.6
LnGrp LOS	F	A	A	C	C	C	F	D	D	F	F	F
Approach Vol, veh/h		432			204			1618			2106	
Approach Delay, s/veh		130.3			27.3			54.3			103.4	
Approach LOS		F			C			D			F	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	16.0	46.0		28.0	11.0	51.0		28.0				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	10.0	40.0		22.0	5.0	45.0		22.0				
Max Q Clear Time (g_c+I1), s	12.1	41.6		25.0	7.4	48.0		8.2				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	0.0		0.6				
Intersection Summary												
HCM 6th Ctrl Delay			84.3									
HCM 6th LOS			F									

Intersection	
Int Delay, s/veh	0.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	3	51	1402	9	55	1808
Future Vol, veh/h	3	51	1402	9	55	1808
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	200	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	32	32	9	9	12	12
Mvmt Flow	3	51	1402	9	55	1808

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2421	706	0	0	1411	0
Stage 1	1407	-	-	-	-	-
Stage 2	1014	-	-	-	-	-
Critical Hdwy	7.44	7.54	-	-	4.34	-
Critical Hdwy Stg 1	6.44	-	-	-	-	-
Critical Hdwy Stg 2	6.44	-	-	-	-	-
Follow-up Hdwy	3.82	3.62	-	-	2.32	-
Pot Cap-1 Maneuver	18	317	-	-	431	-
Stage 1	146	-	-	-	-	-
Stage 2	251	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	16	317	-	-	431	-
Mov Cap-2 Maneuver	87	-	-	-	-	-
Stage 1	146	-	-	-	-	-
Stage 2	219	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	21.2	0	0.4
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	276	431	-
HCM Lane V/C Ratio	-	-	0.196	0.128	-
HCM Control Delay (s)	-	-	21.2	14.6	-
HCM Lane LOS	-	-	C	B	-
HCM 95th %tile Q(veh)	-	-	0.7	0.4	-

Movement	EBL	EBR	NBU	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (veh/h)	31	163	2	102	1371	1754	83
Future Volume (veh/h)	31	163	2	102	1371	1754	83
Initial Q (Qb), veh	0	0		0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00			1.00
Parking Bus, Adj	1.00	1.00		1.00	1.00	1.00	1.00
Work Zone On Approach	No				No	No	
Adj Sat Flow, veh/h/ln	1870	1870		1870	1870	1870	1870
Adj Flow Rate, veh/h	31	163		102	1371	1754	83
Peak Hour Factor	1.00	1.00		1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2		2	2	2	2
Cap, veh/h	246	219		149	2632	2123	100
Arrive On Green	0.14	0.14		0.08	0.74	0.61	0.61
Sat Flow, veh/h	1781	1585		1781	3647	3549	162
Grp Volume(v), veh/h	31	163		102	1371	896	941
Grp Sat Flow(s),veh/h/ln	1781	1585		1781	1777	1777	1841
Q Serve(g_s), s	1.3	8.1		4.6	13.4	32.3	33.2
Cycle Q Clear(g_c), s	1.3	8.1		4.6	13.4	32.3	33.2
Prop In Lane	1.00	1.00		1.00			0.09
Lane Grp Cap(c), veh/h	246	219		149	2632	1092	1131
V/C Ratio(X)	0.13	0.75		0.68	0.52	0.82	0.83
Avail Cap(c_a), veh/h	411	366		149	2632	1092	1131
HCM Platoon Ratio	1.00	1.00		1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00		1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.1	34.1		36.7	4.5	12.4	12.5
Incr Delay (d2), s/veh	0.2	5.0		12.1	0.7	7.0	7.2
Initial Q Delay(d3),s/veh	0.0	0.0		0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	7.2		2.5	3.7	12.8	13.7
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	31.4	39.1		48.8	5.3	19.3	19.7
LnGrp LOS	C	D		D	A	B	B
Approach Vol, veh/h	194				1473	1837	
Approach Delay, s/veh	37.9				8.3	19.5	
Approach LOS	D				A	B	

Timer - Assigned Phs		2		4	5	6	
Phs Duration (G+Y+Rc), s		66.0		16.4	10.4	55.6	
Change Period (Y+Rc), s		6.0		6.0	4.5	6.0	
Max Green Setting (Gmax), s		60.0		18.0	5.9	49.6	
Max Q Clear Time (g_c+I1), s		15.4		10.1	6.6	35.2	
Green Ext Time (p_c), s		15.0		0.3	0.0	10.9	

Intersection Summary			
HCM 6th Ctrl Delay			15.8
HCM 6th LOS			B

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	253	46	74	7	1	6	28	1135	24	22	1282	249
Future Volume (veh/h)	253	46	74	7	1	6	28	1135	24	22	1282	249
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1648	1648	1648	1826	1826	1826	1737	1737	1737	1678	1678	1678
Adj Flow Rate, veh/h	253	46	74	7	1	6	28	1135	24	22	1282	249
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	17	17	17	5	5	5	11	11	11	15	15	15
Cap, veh/h	344	136	219	165	33	115	56	2001	42	48	1605	308
Arrive On Green	0.24	0.24	0.24	0.24	0.24	0.24	0.07	1.00	1.00	0.03	0.60	0.60
Sat Flow, veh/h	1241	569	915	501	139	480	1654	3305	70	1598	2667	512
Grp Volume(v), veh/h	253	0	120	14	0	0	28	567	592	22	761	770
Grp Sat Flow(s),veh/h/ln	1241	0	1483	1120	0	0	1654	1650	1724	1598	1594	1585
Q Serve(g_s), s	16.9	0.0	8.0	0.1	0.0	0.0	2.0	0.0	0.0	1.6	43.6	45.2
Cycle Q Clear(g_c), s	25.0	0.0	8.0	8.1	0.0	0.0	2.0	0.0	0.0	1.6	43.6	45.2
Prop In Lane	1.00		0.62	0.50		0.43	1.00		0.04	1.00		0.32
Lane Grp Cap(c), veh/h	344	0	355	313	0	0	56	999	1044	48	959	954
V/C Ratio(X)	0.74	0.00	0.34	0.04	0.00	0.00	0.50	0.57	0.57	0.46	0.79	0.81
Avail Cap(c_a), veh/h	388	0	408	363	0	0	83	999	1044	80	959	954
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.69	0.69	0.69
Uniform Delay (d), s/veh	44.6	0.0	37.7	35.1	0.0	0.0	55.0	0.0	0.0	57.2	18.2	18.5
Incr Delay (d2), s/veh	6.3	0.0	0.6	0.1	0.0	0.0	6.9	2.3	2.2	4.7	4.7	5.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.9	0.0	3.0	0.3	0.0	0.0	0.9	0.6	0.6	0.7	14.7	15.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.9	0.0	38.3	35.2	0.0	0.0	61.9	2.3	2.2	61.9	22.9	23.7
LnGrp LOS	D	A	D	D	A	A	E	A	A	E	C	C
Approach Vol, veh/h		373			14			1187			1553	
Approach Delay, s/veh		46.8			35.2			3.7			23.8	
Approach LOS		D			D			A			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.6	77.6		33.8	9.0	77.2		33.8				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	5.0	65.0		32.0	5.0	65.0		32.0				
Max Q Clear Time (g_c+I1), s	3.6	2.0		27.0	4.0	47.2		10.1				
Green Ext Time (p_c), s	0.0	8.2		0.8	0.0	9.3		0.0				
Intersection Summary												
HCM 6th Ctrl Delay			19.0									
HCM 6th LOS			B									

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	35	1167	7	9	1353
Future Vol, veh/h	0	35	1167	7	9	1353
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	35	1167	7	9	1353

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	587	0	0	1174	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	4.14	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	0	453	-	-	591	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	453	-	-	591	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.6	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	453	591	-
HCM Lane V/C Ratio	-	-	0.077	0.015	-
HCM Control Delay (s)	-	-	13.6	11.2	-
HCM Lane LOS	-	-	B	B	-
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	165	423	184	76	175	111	132	809	82	105	1075	144
Future Volume (veh/h)	165	423	184	76	175	111	132	809	82	105	1075	144
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1767	1767	1767	1604	1604	1604	1767	1767	1767	1781	1781	1781
Adj Flow Rate, veh/h	165	423	184	76	175	111	132	809	82	105	1075	144
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	9	9	9	20	20	20	9	9	9	8	8	8
Cap, veh/h	205	468	396	105	387	233	169	1287	130	139	1352	603
Arrive On Green	0.12	0.26	0.26	0.07	0.21	0.21	0.10	0.42	0.42	0.16	0.80	0.80
Sat Flow, veh/h	1682	1767	1497	1527	1829	1100	1682	3077	312	1697	3385	1510
Grp Volume(v), veh/h	165	423	184	76	144	142	132	441	450	105	1075	144
Grp Sat Flow(s),veh/h/ln	1682	1767	1497	1527	1523	1406	1682	1678	1710	1697	1692	1510
Q Serve(g_s), s	11.5	27.8	12.4	5.9	9.9	10.6	9.2	24.9	24.9	7.1	21.0	2.8
Cycle Q Clear(g_c), s	11.5	27.8	12.4	5.9	9.9	10.6	9.2	24.9	24.9	7.1	21.0	2.8
Prop In Lane	1.00		1.00	1.00		0.78	1.00		0.18	1.00		1.00
Lane Grp Cap(c), veh/h	205	468	396	105	322	297	169	702	715	139	1352	603
V/C Ratio(X)	0.81	0.90	0.46	0.73	0.45	0.48	0.78	0.63	0.63	0.76	0.80	0.24
Avail Cap(c_a), veh/h	294	501	424	115	322	297	182	702	715	156	1352	603
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.3	42.7	37.0	54.8	41.2	41.5	52.7	27.6	27.6	49.0	9.4	7.5
Incr Delay (d2), s/veh	10.1	19.1	0.8	18.6	1.0	1.2	18.1	4.2	4.2	17.0	4.9	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.3	14.1	4.5	2.7	3.7	3.7	4.6	10.0	10.2	3.4	4.1	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.4	61.8	37.8	73.4	42.2	42.7	70.7	31.8	31.7	66.0	14.3	8.5
LnGrp LOS	E	E	D	E	D	D	E	C	C	E	B	A
Approach Vol, veh/h		772			362			1023			1324	
Approach Delay, s/veh		56.0			48.9			36.8			17.7	
Approach LOS		E			D			D			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.8	55.2	13.2	36.8	17.1	52.9	19.6	30.4
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	10.0	45.0	8.0	33.0	12.0	43.0	20.0	21.0
Max Q Clear Time (g_c+I1), s	9.1	26.9	7.9	29.8	11.2	23.0	13.5	12.6
Green Ext Time (p_c), s	0.0	4.6	0.0	1.0	0.0	7.2	0.2	0.9

Intersection Summary	
HCM 6th Ctrl Delay	35.1
HCM 6th LOS	D

Intersection	
Int Delay, s/veh	1.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	5	73	19	16	12
Future Vol, veh/h	5	5	73	19	16	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	50	50	50	50	50	50
Mvmt Flow	5	5	73	19	16	12

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	127	83	0	0	92	0
Stage 1	83	-	-	-	-	-
Stage 2	44	-	-	-	-	-
Critical Hdwy	6.9	6.7	-	-	4.6	-
Critical Hdwy Stg 1	5.9	-	-	-	-	-
Critical Hdwy Stg 2	5.9	-	-	-	-	-
Follow-up Hdwy	3.95	3.75	-	-	2.65	-
Pot Cap-1 Maneuver	765	859	-	-	1249	-
Stage 1	832	-	-	-	-	-
Stage 2	869	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	755	859	-	-	1249	-
Mov Cap-2 Maneuver	755	-	-	-	-	-
Stage 1	832	-	-	-	-	-
Stage 2	858	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.5	0	4.5
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	804	1249	-
HCM Lane V/C Ratio	-	-	0.012	0.013	-
HCM Control Delay (s)	-	-	9.5	7.9	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection						
Int Delay, s/veh	3.1					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	275	146	70	208	81	92
Future Vol, veh/h	275	146	70	208	81	92
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	200	-	200	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	275	146	70	208	81	92

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	421	0	696	348
Stage 1	-	-	-	-	348	-
Stage 2	-	-	-	-	348	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1138	-	408	695
Stage 1	-	-	-	-	715	-
Stage 2	-	-	-	-	715	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1138	-	383	695
Mov Cap-2 Maneuver	-	-	-	-	490	-
Stage 1	-	-	-	-	715	-
Stage 2	-	-	-	-	671	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.1	12.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	490	695	-	-	1138	-
HCM Lane V/C Ratio	0.165	0.132	-	-	0.062	-
HCM Control Delay (s)	13.8	11	-	-	8.4	-
HCM Lane LOS	B	B	-	-	A	-
HCM 95th %tile Q(veh)	0.6	0.5	-	-	0.2	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	192	601	214	177	38	405	758	197	65	1269	30
Future Volume (veh/h)	38	192	601	214	177	38	405	758	197	65	1269	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	38	192	601	214	177	38	405	758	197	65	1269	30
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	80	750	564	218	1024	457	499	1565	403	103	1539	36
Arrive On Green	0.05	0.21	0.21	0.12	0.29	0.29	0.14	0.39	0.39	0.06	0.30	0.30
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	3456	4046	1041	1781	5131	121
Grp Volume(v), veh/h	38	192	601	214	177	38	405	636	319	65	842	457
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1728	1702	1683	1781	1702	1849
Q Serve(g_s), s	1.9	4.1	19.0	10.8	3.4	1.6	10.2	12.7	12.9	3.2	20.7	20.7
Cycle Q Clear(g_c), s	1.9	4.1	19.0	10.8	3.4	1.6	10.2	12.7	12.9	3.2	20.7	20.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.62	1.00		0.07
Lane Grp Cap(c), veh/h	80	750	564	218	1024	457	499	1316	651	103	1021	555
V/C Ratio(X)	0.47	0.26	1.07	0.98	0.17	0.08	0.81	0.48	0.49	0.63	0.82	0.82
Avail Cap(c_a), veh/h	119	750	564	218	1024	457	499	1316	651	158	1021	555
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.9	29.6	29.0	39.4	24.0	23.4	37.3	20.8	20.9	41.5	29.3	29.3
Incr Delay (d2), s/veh	4.2	0.2	56.8	55.9	0.1	0.1	9.8	1.3	2.6	6.2	7.5	13.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	1.7	20.5	8.0	1.4	0.6	4.9	5.1	5.4	1.6	9.2	10.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.2	29.8	85.8	95.4	24.1	23.4	47.1	22.1	23.5	47.7	36.8	42.4
LnGrp LOS	D	C	F	F	C	C	D	C	C	D	D	D
Approach Vol, veh/h		831			429			1360			1364	
Approach Delay, s/veh		71.1			59.6			29.9			39.2	
Approach LOS		E			E			C			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.2	39.8	16.0	24.0	18.0	32.0	9.1	30.9				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	7.0	31.0	10.0	18.0	12.0	26.0	5.0	23.0				
Max Q Clear Time (g_c+I1), s	5.2	14.9	12.8	21.0	12.2	22.7	3.9	5.4				
Green Ext Time (p_c), s	0.0	5.9	0.0	0.0	0.0	2.3	0.0	1.1				
Intersection Summary												
HCM 6th Ctrl Delay			44.9									
HCM 6th LOS			D									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	827	5	419	596	1115	0	0	1240	588
Future Volume (veh/h)	0	0	0	827	5	419	596	1115	0	0	1240	588
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1737	1737	1737	1678	1678	0	0	1870	1870
Adj Flow Rate, veh/h				959	0	281	596	1115	0	0	1240	588
Peak Hour Factor				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %				11	11	11	15	15	0	0	2	2
Cap, veh/h				1092	0	486	694	2548	0	0	1774	437
Arrive On Green				0.33	0.00	0.33	0.22	0.56	0.00	0.00	0.28	0.28
Sat Flow, veh/h				3309	0	1472	3100	4731	0	0	6696	1585
Grp Volume(v), veh/h				959	0	281	596	1115	0	0	1240	588
Grp Sat Flow(s),veh/h/ln				1654	0	1472	1550	1527	0	0	1609	1585
Q Serve(g_s), s				24.1	0.0	13.9	16.3	12.6	0.0	0.0	15.2	24.3
Cycle Q Clear(g_c), s				24.1	0.0	13.9	16.3	12.6	0.0	0.0	15.2	24.3
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				1092	0	486	694	2548	0	0	1774	437
V/C Ratio(X)				0.88	0.00	0.58	0.86	0.44	0.00	0.00	0.70	1.35
Avail Cap(c_a), veh/h				1165	0	518	739	2548	0	0	1774	437
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				27.8	0.0	24.4	32.8	11.5	0.0	0.0	28.6	31.9
Incr Delay (d2), s/veh				7.6	0.0	1.4	9.5	0.5	0.0	0.0	2.3	170.2
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				10.3	0.0	4.9	6.4	3.5	0.0	0.0	5.5	28.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				35.4	0.0	25.9	42.4	12.0	0.0	0.0	30.9	202.0
LnGrp LOS				D	A	C	D	B	A	A	C	F
Approach Vol, veh/h					1240			1711			1828	
Approach Delay, s/veh					33.2			22.6			86.0	
Approach LOS					C			C			F	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		54.0			24.7	29.3		34.1				
Change Period (Y+Rc), s		6.0			6.0	6.0		6.0				
Max Green Setting (Gmax), s		48.0			20.0	22.0		30.0				
Max Q Clear Time (g_c+I1), s		14.6			18.3	26.3		26.1				
Green Ext Time (p_c), s		8.2			0.4	0.0		2.0				
Intersection Summary												
HCM 6th Ctrl Delay			49.6									
HCM 6th LOS			D									
Notes												

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	379	8	752	0	0	0	0	1329	684	426	1643	0
Future Volume (veh/h)	379	8	752	0	0	0	0	1329	684	426	1643	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1693	1693	1693				0	1574	1574	1796	1796	0
Adj Flow Rate, veh/h	255	0	890				0	1329	684	426	1643	0
Peak Hour Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	14	14	14				0	22	22	7	7	0
Cap, veh/h	430	0	765				0	1273	593	406	2124	0
Arrive On Green	0.27	0.00	0.27				0.00	0.44	0.44	0.12	0.62	0.00
Sat Flow, veh/h	1612	0	2869				0	3006	1334	3319	3503	0
Grp Volume(v), veh/h	255	0	890				0	1329	684	426	1643	0
Grp Sat Flow(s),veh/h/ln	1612	0	1434				0	1432	1334	1659	1706	0
Q Serve(g_s), s	12.4	0.0	24.0				0.0	40.0	40.0	11.0	31.6	0.0
Cycle Q Clear(g_c), s	12.4	0.0	24.0				0.0	40.0	40.0	11.0	31.6	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	430	0	765				0	1273	593	406	2124	0
V/C Ratio(X)	0.59	0.00	1.16				0.00	1.04	1.15	1.05	0.77	0.00
Avail Cap(c_a), veh/h	430	0	765				0	1273	593	406	2124	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	28.7	0.0	33.0				0.0	25.0	25.0	39.5	12.4	0.0
Incr Delay (d2), s/veh	2.2	0.0	87.6				0.0	37.5	87.3	58.5	2.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.9	0.0	17.4				0.0	17.9	24.9	7.4	9.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.9	0.0	120.6				0.0	62.5	112.3	98.0	15.2	0.0
LnGrp LOS	C	A	F				A	F	F	F	B	A
Approach Vol, veh/h		1145						2013			2069	
Approach Delay, s/veh		100.6						79.4			32.2	
Approach LOS		F						E			C	

Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	16.0	45.0		29.0		61.0						
Change Period (Y+Rc), s	6.0	6.0		6.0		6.0						
Max Green Setting (Gmax), s	10.0	39.0		23.0		55.0						
Max Q Clear Time (g_c+I1), s	13.0	42.0		26.0		33.6						
Green Ext Time (p_c), s	0.0	0.0		0.0		11.8						

Intersection Summary			
HCM 6th Ctrl Delay			65.4
HCM 6th LOS			E

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	424	21	135	38	29	61	142	1459	32	44	1765	569
Future Volume (veh/h)	424	21	135	38	29	61	142	1459	32	44	1765	569
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1693	1693	1693	1455	1455	1455	1500	1500	1500	1722	1722	1722
Adj Flow Rate, veh/h	424	21	135	38	29	61	142	1459	32	44	1765	569
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	14	14	14	30	30	30	27	27	27	12	12	12
Cap, veh/h	332	428	363	312	349	312	110	1524	33	79	1248	381
Arrive On Green	0.25	0.25	0.25	0.25	0.25	0.25	0.08	0.53	0.53	0.05	0.51	0.51
Sat Flow, veh/h	1182	1693	1434	958	1383	1233	1428	2851	62	1640	2468	754
Grp Volume(v), veh/h	424	21	135	38	29	61	142	728	763	44	1137	1197
Grp Sat Flow(s),veh/h/ln	1182	1693	1434	958	1383	1233	1428	1425	1489	1640	1636	1586
Q Serve(g_s), s	19.5	0.9	7.1	2.8	1.5	3.5	7.0	44.3	44.5	2.4	46.0	46.0
Cycle Q Clear(g_c), s	23.0	0.9	7.1	3.7	1.5	3.5	7.0	44.3	44.5	2.4	46.0	46.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.04	1.00		0.48
Lane Grp Cap(c), veh/h	332	428	363	312	349	312	110	762	796	79	827	802
V/C Ratio(X)	1.28	0.05	0.37	0.12	0.08	0.20	1.29	0.96	0.96	0.56	1.37	1.49
Avail Cap(c_a), veh/h	332	428	363	312	349	312	110	762	796	108	827	802
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.1	25.7	28.0	27.1	26.0	26.7	42.0	20.2	20.2	42.4	22.5	22.5
Incr Delay (d2), s/veh	146.0	0.0	0.6	0.2	0.1	0.3	183.5	22.5	22.2	6.1	176.3	228.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	20.7	0.3	2.3	0.6	0.5	1.0	7.9	16.3	17.1	1.0	54.7	64.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	184.1	25.8	28.7	27.3	26.1	27.0	225.5	42.6	42.5	48.5	198.8	250.8
LnGrp LOS	F	C	C	C	C	C	F	D	D	D	F	F
Approach Vol, veh/h		580			128			1633			2378	
Approach Delay, s/veh		142.2			26.9			58.5			222.2	
Approach LOS		F			C			E			F	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.4	53.6		28.0	12.0	51.0		28.0				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	5.0	45.0		22.0	6.0	45.0		22.0				
Max Q Clear Time (g_c+I1), s	4.4	46.5		25.0	9.0	48.0		5.7				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	0.0		0.5				
Intersection Summary												
HCM 6th Ctrl Delay			150.4									
HCM 6th LOS			F									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	349	79	125	55	74	125	100	1199	61	240	1341	295
Future Volume (veh/h)	349	79	125	55	74	125	100	1199	61	240	1341	295
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1411	1411	1411	625	625	625	1574	1574	1574	1678	1678	1678
Adj Flow Rate, veh/h	349	79	125	55	74	125	100	1199	61	240	1341	295
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	33	33	33	86	86	86	22	22	22	15	15	15
Cap, veh/h	244	40	64	225	229	194	100	1030	52	178	1043	225
Arrive On Green	0.37	0.37	0.37	0.37	0.37	0.37	0.07	0.36	0.36	0.11	0.40	0.40
Sat Flow, veh/h	486	110	174	394	625	530	1499	2896	147	1598	2607	564
Grp Volume(v), veh/h	553	0	0	55	74	125	100	619	641	240	811	825
Grp Sat Flow(s),veh/h/ln	770	0	0	394	625	530	1499	1495	1547	1598	1594	1576
Q Serve(g_s), s	25.4	0.0	0.0	0.0	7.6	17.6	6.0	32.0	32.0	10.0	36.0	36.0
Cycle Q Clear(g_c), s	33.0	0.0	0.0	9.2	7.6	17.6	6.0	32.0	32.0	10.0	36.0	36.0
Prop In Lane	0.63		0.23	1.00		1.00	1.00		0.10	1.00		0.36
Lane Grp Cap(c), veh/h	348	0	0	225	229	194	100	532	550	178	638	631
V/C Ratio(X)	1.59	0.00	0.00	0.24	0.32	0.64	1.00	1.16	1.17	1.35	1.27	1.31
Avail Cap(c_a), veh/h	348	0	0	225	229	194	100	532	550	178	638	631
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.7	0.0	0.0	21.0	20.5	23.6	42.0	29.0	29.0	40.0	27.0	27.0
Incr Delay (d2), s/veh	278.9	0.0	0.0	0.6	0.8	7.0	90.2	92.8	92.9	190.7	134.4	150.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	34.5	0.0	0.0	0.8	1.1	2.4	4.6	23.7	24.5	13.0	35.5	37.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	313.6	0.0	0.0	21.5	21.3	30.7	132.2	121.8	121.9	230.7	161.4	177.1
LnGrp LOS	F	A	A	C	C	C	F	F	F	F	F	F
Approach Vol, veh/h		553			254			1360			1876	
Approach Delay, s/veh		313.6			26.0			122.6			177.2	
Approach LOS		F			C			F			F	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	15.0	37.0		38.0	11.0	41.0		38.0				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	9.0	31.0		32.0	5.0	35.0		32.0				
Max Q Clear Time (g_c+I1), s	12.0	34.0		35.0	8.0	38.0		19.6				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	0.0		1.3				
Intersection Summary												
HCM 6th Ctrl Delay			168.0									
HCM 6th LOS			F									

Intersection						
Int Delay, s/veh	1.5					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	82	1157	7	169	1273
Future Vol, veh/h	0	82	1157	7	169	1273
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	200	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	59	59	20	20	15	15
Mvmt Flow	0	82	1157	7	169	1273

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2136	582	0	0	1164	0
Stage 1	1161	-	-	-	-	-
Stage 2	975	-	-	-	-	-
Critical Hdwy	7.98	8.08	-	-	4.4	-
Critical Hdwy Stg 1	6.98	-	-	-	-	-
Critical Hdwy Stg 2	6.98	-	-	-	-	-
Follow-up Hdwy	4.09	3.89	-	-	2.35	-
Pot Cap-1 Maneuver	21	338	-	-	527	-
Stage 1	167	-	-	-	-	-
Stage 2	220	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	14	338	-	-	527	-
Mov Cap-2 Maneuver	78	-	-	-	-	-
Stage 1	167	-	-	-	-	-
Stage 2	149	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	19	0	1.8
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	338	527	-
HCM Lane V/C Ratio	-	-	0.243	0.321	-
HCM Control Delay (s)	-	-	19	15	-
HCM Lane LOS	-	-	C	C	-
HCM 95th %tile Q(veh)	-	-	0.9	1.4	-

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	59	141	80	1136	1258	79
Future Volume (veh/h)	59	141	80	1136	1258	79
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	59	141	80	1136	1258	79
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	376	335	178	2409	1773	111
Arrive On Green	0.21	0.21	0.10	0.68	0.52	0.52
Sat Flow, veh/h	1781	1585	1781	3647	3489	213
Grp Volume(v), veh/h	59	141	80	1136	657	680
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1777	1777	1832
Q Serve(g_s), s	2.4	6.9	3.8	13.6	25.2	25.4
Cycle Q Clear(g_c), s	2.4	6.9	3.8	13.6	25.2	25.4
Prop In Lane	1.00	1.00	1.00			0.12
Lane Grp Cap(c), veh/h	376	335	178	2409	928	957
V/C Ratio(X)	0.16	0.42	0.45	0.47	0.71	0.71
Avail Cap(c_a), veh/h	376	335	178	2409	928	957
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.0	30.7	38.2	6.9	16.3	16.3
Incr Delay (d2), s/veh	0.9	3.9	8.0	0.7	4.6	4.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	6.7	2.0	4.5	10.6	11.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	29.9	34.6	46.1	7.5	20.9	20.8
LnGrp LOS	C	C	D	A	C	C
Approach Vol, veh/h	200			1216	1337	
Approach Delay, s/veh	33.2			10.1	20.8	
Approach LOS	C			B	C	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		66.0		24.0	14.0	52.0
Change Period (Y+Rc), s		6.0		6.0	6.0	6.0
Max Green Setting (Gmax), s		60.0		18.0	8.0	46.0
Max Q Clear Time (g_c+I1), s		15.6		8.9	5.8	27.4
Green Ext Time (p_c), s		11.2		0.4	0.0	9.3

Intersection Summary			
HCM 6th Ctrl Delay			17.0
HCM 6th LOS			B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	204	45	29	29	5	5	34	1024	69	8	1270	250
Future Volume (veh/h)	204	45	29	29	5	5	34	1024	69	8	1270	250
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1337	1337	1337	1085	1085	1085	1633	1633	1633	1633	1633	1633
Adj Flow Rate, veh/h	204	45	29	29	5	5	34	1024	69	8	1270	250
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	38	38	38	55	55	55	18	18	18	18	18	18
Cap, veh/h	289	172	111	160	24	19	57	1860	125	28	1585	309
Arrive On Green	0.23	0.23	0.23	0.23	0.23	0.23	0.07	1.00	1.00	0.02	0.61	0.61
Sat Flow, veh/h	1004	759	489	477	106	86	1555	2950	199	1555	2590	504
Grp Volume(v), veh/h	204	0	74	39	0	0	34	538	555	8	756	764
Grp Sat Flow(s),veh/h/ln	1004	0	1249	668	0	0	1555	1552	1597	1555	1552	1542
Q Serve(g_s), s	13.6	0.0	5.8	4.0	0.0	0.0	2.5	0.0	0.0	0.6	44.2	45.8
Cycle Q Clear(g_c), s	23.5	0.0	5.8	9.9	0.0	0.0	2.5	0.0	0.0	0.6	44.2	45.8
Prop In Lane	1.00		0.39	0.74		0.13	1.00		0.12	1.00		0.33
Lane Grp Cap(c), veh/h	289	0	283	204	0	0	57	978	1007	28	950	944
V/C Ratio(X)	0.71	0.00	0.26	0.19	0.00	0.00	0.60	0.55	0.55	0.28	0.80	0.81
Avail Cap(c_a), veh/h	329	0	333	236	0	0	78	978	1007	78	950	944
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.74	0.74	0.74
Uniform Delay (d), s/veh	45.0	0.0	38.2	41.0	0.0	0.0	54.8	0.0	0.0	58.1	17.6	17.9
Incr Delay (d2), s/veh	5.8	0.0	0.5	0.5	0.0	0.0	9.6	2.2	2.2	4.0	5.2	5.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.4	0.0	1.9	1.0	0.0	0.0	1.1	0.6	0.6	0.3	14.5	15.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.8	0.0	38.7	41.5	0.0	0.0	64.4	2.2	2.2	62.2	22.8	23.5
LnGrp LOS	D	A	D	D	A	A	E	A	A	E	C	C
Approach Vol, veh/h		278			39			1127			1528	
Approach Delay, s/veh		47.6			41.5			4.1			23.4	
Approach LOS		D			D			A			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.2	80.7		32.2	9.4	78.4		32.2				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	5.0	66.0		31.0	5.0	66.0		31.0				
Max Q Clear Time (g_c+I1), s	2.6	2.0		25.5	4.5	47.8		11.9				
Green Ext Time (p_c), s	0.0	7.6		0.7	0.0	9.3		0.1				
Intersection Summary												
HCM 6th Ctrl Delay			18.6									
HCM 6th LOS			B									
Notes												

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	11	1121	17	21	1307
Future Vol, veh/h	0	11	1121	17	21	1307
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	11	1121	17	21	1307

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	569	0	0	1138	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	4.14	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	0	465	-	-	610	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	465	-	-	610	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.9	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	465	610	-
HCM Lane V/C Ratio	-	-	0.024	0.034	-
HCM Control Delay (s)	-	-	12.9	11.1	-
HCM Lane LOS	-	-	B	B	-
HCM 95th %tile Q(veh)	-	-	0.1	0.1	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	158	99	78	100	290	91	131	773	37	55	998	158
Future Volume (veh/h)	158	99	78	100	290	91	131	773	37	55	998	158
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1604	1604	1604	1678	1678	1678	1693	1693	1693	1737	1737	1737
Adj Flow Rate, veh/h	158	99	78	100	290	91	131	773	37	55	998	158
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	20	20	20	15	15	15	14	14	14	11	11	11
Cap, veh/h	193	304	258	134	354	109	167	1594	76	82	1505	671
Arrive On Green	0.13	0.19	0.19	0.08	0.15	0.15	0.10	0.51	0.51	0.10	0.91	0.91
Sat Flow, veh/h	1527	1604	1359	1598	2400	738	1612	3124	149	1654	3300	1472
Grp Volume(v), veh/h	158	99	78	100	191	190	131	398	412	55	998	158
Grp Sat Flow(s),veh/h/ln	1527	1604	1359	1598	1594	1545	1612	1608	1666	1654	1650	1472
Q Serve(g_s), s	12.1	6.4	5.9	7.3	13.9	14.4	9.5	19.3	19.3	3.9	8.1	1.4
Cycle Q Clear(g_c), s	12.1	6.4	5.9	7.3	13.9	14.4	9.5	19.3	19.3	3.9	8.1	1.4
Prop In Lane	1.00		1.00	1.00		0.48	1.00		0.09	1.00		1.00
Lane Grp Cap(c), veh/h	193	304	258	134	235	228	167	820	850	82	1505	671
V/C Ratio(X)	0.82	0.33	0.30	0.75	0.81	0.83	0.78	0.48	0.49	0.67	0.66	0.24
Avail Cap(c_a), veh/h	229	307	260	186	252	245	201	820	850	138	1505	671
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.1	42.0	41.8	53.7	49.5	49.7	52.5	19.1	19.1	53.1	3.2	2.9
Incr Delay (d2), s/veh	17.9	0.6	0.7	9.9	16.8	20.4	15.3	2.0	2.0	9.2	2.3	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5	2.5	2.0	3.2	6.5	6.7	4.4	7.0	7.2	1.7	1.7	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	69.1	42.6	42.4	63.6	66.3	70.1	67.8	21.2	21.1	62.3	5.5	3.8
LnGrp LOS	E	D	D	E	E	E	E	C	C	E	A	A
Approach Vol, veh/h		335			481			941			1211	
Approach Delay, s/veh		55.0			67.3			27.6			7.9	
Approach LOS		E			E			C			A	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.9	66.2	15.1	27.8	17.4	59.7	20.1	22.7
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	9.0	52.0	13.0	22.0	14.0	47.0	17.0	18.0
Max Q Clear Time (g_c+I1), s	5.9	21.3	9.3	8.4	11.5	10.1	14.1	16.4
Green Ext Time (p_c), s	0.0	4.7	0.1	0.5	0.1	8.0	0.1	0.3

Intersection Summary	
HCM 6th Ctrl Delay	29.1
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	5.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	19	35	31	91	134	19
Future Vol, veh/h	19	35	31	91	134	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	50	50	50	50	50	50
Mvmt Flow	19	35	31	91	134	19

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	364	77	0	0	122	0
Stage 1	77	-	-	-	-	-
Stage 2	287	-	-	-	-	-
Critical Hdwy	6.9	6.7	-	-	4.6	-
Critical Hdwy Stg 1	5.9	-	-	-	-	-
Critical Hdwy Stg 2	5.9	-	-	-	-	-
Follow-up Hdwy	3.95	3.75	-	-	2.65	-
Pot Cap-1 Maneuver	550	866	-	-	1215	-
Stage 1	838	-	-	-	-	-
Stage 2	664	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	489	866	-	-	1215	-
Mov Cap-2 Maneuver	489	-	-	-	-	-
Stage 1	838	-	-	-	-	-
Stage 2	590	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.7	0	7.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	681	1215	-
HCM Lane V/C Ratio	-	-	0.079	0.11	-
HCM Control Delay (s)	-	-	10.7	8.3	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0.4	-

Intersection	
Int Delay, s/veh	4.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	181	73	74	215	134	74
Future Vol, veh/h	181	73	74	215	134	74
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	200	-	200	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	181	73	74	215	134	74

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	254	0	581	218
Stage 1	-	-	-	-	218	-
Stage 2	-	-	-	-	363	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1311	-	476	822
Stage 1	-	-	-	-	818	-
Stage 2	-	-	-	-	704	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1311	-	449	822
Mov Cap-2 Maneuver	-	-	-	-	534	-
Stage 1	-	-	-	-	818	-
Stage 2	-	-	-	-	665	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2	12.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	534	822	-	-	1311	-
HCM Lane V/C Ratio	0.251	0.09	-	-	0.056	-
HCM Control Delay (s)	14	9.8	-	-	7.9	-
HCM Lane LOS	B	A	-	-	A	-
HCM 95th %tile Q(veh)	1	0.3	-	-	0.2	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	98	263	526	226	306	131	620	1387	231	85	924	61
Future Volume (veh/h)	98	263	526	226	306	131	620	1387	231	85	924	61
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	98	263	526	226	306	131	620	1387	231	85	924	61
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	144	750	634	277	977	436	653	1568	261	119	1142	75
Arrive On Green	0.08	0.21	0.21	0.16	0.27	0.27	0.19	0.36	0.36	0.07	0.23	0.23
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	3456	4409	734	1781	4894	322
Grp Volume(v), veh/h	98	263	526	226	306	131	620	1071	547	85	642	343
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1728	1702	1738	1781	1702	1812
Q Serve(g_s), s	4.8	5.7	19.0	11.0	6.1	5.9	16.0	26.6	26.6	4.2	16.0	16.1
Cycle Q Clear(g_c), s	4.8	5.7	19.0	11.0	6.1	5.9	16.0	26.6	26.6	4.2	16.0	16.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.42	1.00		0.18
Lane Grp Cap(c), veh/h	144	750	634	277	977	436	653	1210	618	119	794	423
V/C Ratio(X)	0.68	0.35	0.83	0.82	0.31	0.30	0.95	0.88	0.89	0.72	0.81	0.81
Avail Cap(c_a), veh/h	198	750	634	277	977	436	653	1210	618	119	794	423
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.2	30.2	24.2	36.8	25.9	25.8	36.1	27.3	27.3	41.2	32.6	32.6
Incr Delay (d2), s/veh	5.6	0.3	9.1	17.0	0.2	0.4	23.5	9.6	16.9	18.5	8.7	15.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	2.4	11.1	6.0	2.6	2.2	8.7	11.9	13.5	2.4	7.4	8.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.8	30.5	33.3	53.7	26.1	26.2	59.6	36.9	44.2	59.6	41.3	48.1
LnGrp LOS	D	C	C	D	C	C	E	D	D	E	D	D
Approach Vol, veh/h		887			663			2238			1070	
Approach Delay, s/veh		33.9			35.5			45.0			44.9	
Approach LOS		C			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	37.0	18.0	24.0	22.0	26.0	12.3	29.7
Change Period (Y+Rc), s	6.0	6.0	5.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	5.0	31.0	13.0	18.0	16.0	20.0	9.0	21.0
Max Q Clear Time (g_c+I1), s	6.2	28.6	13.0	21.0	18.0	18.1	6.8	8.1
Green Ext Time (p_c), s	0.0	1.9	0.0	0.0	0.0	1.2	0.0	2.0

Intersection Summary			
HCM 6th Ctrl Delay			41.6
HCM 6th LOS			D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	878	3	535	615	1775	0	0	1346	448
Future Volume (veh/h)	0	0	0	878	3	535	615	1775	0	0	1346	448
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1752	1752	1752	1841	1841	0	0	1856	1856
Adj Flow Rate, veh/h				1046	0	358	615	1775	0	0	1346	448
Peak Hour Factor				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %				10	10	10	4	4	0	0	3	3
Cap, veh/h				1200	0	534	718	2644	0	0	1647	406
Arrive On Green				0.36	0.00	0.36	0.21	0.53	0.00	0.00	0.26	0.26
Sat Flow, veh/h				3337	0	1485	3401	5191	0	0	6643	1572
Grp Volume(v), veh/h				1046	0	358	615	1775	0	0	1346	448
Grp Sat Flow(s),veh/h/ln				1668	0	1485	1700	1675	0	0	1596	1572
Q Serve(g_s), s				25.6	0.0	17.8	15.2	22.6	0.0	0.0	17.3	22.6
Cycle Q Clear(g_c), s				25.6	0.0	17.8	15.2	22.6	0.0	0.0	17.3	22.6
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				1200	0	534	718	2644	0	0	1647	406
V/C Ratio(X)				0.87	0.00	0.67	0.86	0.67	0.00	0.00	0.82	1.10
Avail Cap(c_a), veh/h				1298	0	577	739	2644	0	0	1647	406
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				26.1	0.0	23.6	33.2	15.2	0.0	0.0	30.5	32.4
Incr Delay (d2), s/veh				6.4	0.0	2.7	9.6	1.4	0.0	0.0	4.6	76.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				10.7	0.0	6.4	6.6	7.2	0.0	0.0	6.5	16.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				32.5	0.0	26.4	42.9	16.6	0.0	0.0	35.1	108.5
LnGrp LOS				C	A	C	D	B	A	A	D	F
Approach Vol, veh/h					1404			2390			1794	
Approach Delay, s/veh					31.0			23.3			53.4	
Approach LOS					C			C			D	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		51.0			23.4	27.6		36.4				
Change Period (Y+Rc), s		6.0			6.0	6.0		6.0				
Max Green Setting (Gmax), s		45.0			18.0	21.0		33.0				
Max Q Clear Time (g_c+I1), s		24.6			17.2	24.6		27.6				
Green Ext Time (p_c), s		11.8			0.2	0.0		2.9				
Intersection Summary												
HCM 6th Ctrl Delay			34.9									
HCM 6th LOS			C									

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	632	0	690	0	0	0	0	1752	908	511	1737	0
Future Volume (veh/h)	632	0	690	0	0	0	0	1752	908	511	1737	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1767	1767	1767				0	1781	1781	1796	1796	0
Adj Flow Rate, veh/h	856	0	450				0	1752	908	511	1737	0
Peak Hour Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	9	9	9				0	8	8	7	7	0
Cap, veh/h	823	0	366				0	1514	704	406	2199	0
Arrive On Green	0.24	0.00	0.24				0.00	0.47	0.47	0.12	0.64	0.00
Sat Flow, veh/h	3365	0	1497				0	3404	1508	3319	3503	0
Grp Volume(v), veh/h	856	0	450				0	1751	909	511	1737	0
Grp Sat Flow(s),veh/h/ln	1682	0	1497				0	1621	1510	1659	1706	0
Q Serve(g_s), s	22.0	0.0	22.0				0.0	42.0	42.0	11.0	33.2	0.0
Cycle Q Clear(g_c), s	22.0	0.0	22.0				0.0	42.0	42.0	11.0	33.2	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	823	0	366				0	1513	705	406	2199	0
V/C Ratio(X)	1.04	0.00	1.23				0.00	1.16	1.29	1.26	0.79	0.00
Avail Cap(c_a), veh/h	823	0	366				0	1513	705	406	2199	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	34.0	0.0	34.0				0.0	24.0	24.0	39.5	11.6	0.0
Incr Delay (d2), s/veh	42.4	0.0	125.1				0.0	78.6	141.1	135.5	3.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.6	0.0	20.5				0.0	29.8	40.0	11.8	9.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	76.4	0.0	159.1				0.0	102.6	165.1	175.0	14.6	0.0
LnGrp LOS	F	A	F				A	F	F	F	B	A
Approach Vol, veh/h		1306						2660			2248	
Approach Delay, s/veh		104.9						124.0			51.0	
Approach LOS		F						F			D	

Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	16.0	47.0		27.0		63.0						
Change Period (Y+Rc), s	6.0	6.0		6.0		6.0						
Max Green Setting (Gmax), s	10.0	41.0		21.0		57.0						
Max Q Clear Time (g_c+I1), s	13.0	44.0		24.0		35.2						
Green Ext Time (p_c), s	0.0	0.0		0.0		12.7						

Intersection Summary			
HCM 6th Ctrl Delay			93.6
HCM 6th LOS			F

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	566	124	209	37	31	82	86	1852	31	58	1943	422
Future Volume (veh/h)	566	124	209	37	31	82	86	1852	31	58	1943	422
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1411	1411	1411	1767	1767	1767	1707	1707	1707
Adj Flow Rate, veh/h	566	124	209	37	31	82	86	1852	31	58	1943	422
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	7	7	7	33	33	33	9	9	9	13	13	13
Cap, veh/h	400	559	474	285	417	372	112	1579	26	89	1216	255
Arrive On Green	0.31	0.31	0.31	0.31	0.31	0.31	0.07	0.47	0.47	0.05	0.46	0.46
Sat Flow, veh/h	1229	1796	1522	790	1340	1196	1682	3378	56	1626	2670	559
Grp Volume(v), veh/h	566	124	209	37	31	82	86	918	965	58	1152	1213
Grp Sat Flow(s),veh/h/ln	1229	1796	1522	790	1340	1196	1682	1678	1756	1626	1622	1607
Q Serve(g_s), s	23.4	4.6	9.9	3.3	1.5	4.6	4.5	42.1	42.1	3.1	41.0	41.0
Cycle Q Clear(g_c), s	28.0	4.6	9.9	7.9	1.5	4.6	4.5	42.1	42.1	3.1	41.0	41.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.03	1.00		0.35
Lane Grp Cap(c), veh/h	400	559	474	285	417	372	112	784	821	89	739	732
V/C Ratio(X)	1.41	0.22	0.44	0.13	0.07	0.22	0.77	1.17	1.18	0.65	1.56	1.66
Avail Cap(c_a), veh/h	400	559	474	285	417	372	112	784	821	108	739	732
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.6	22.9	24.8	25.9	21.9	22.9	41.3	24.0	24.0	41.7	24.5	24.5
Incr Delay (d2), s/veh	201.0	0.2	0.6	0.2	0.1	0.3	26.7	89.9	91.8	9.6	258.3	301.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	30.9	1.8	3.4	0.6	0.4	1.2	2.6	33.3	35.3	1.4	66.1	74.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	236.6	23.1	25.4	26.1	21.9	23.2	68.0	113.9	115.8	51.3	282.8	326.2
LnGrp LOS	F	C	C	C	C	C	E	F	F	D	F	F
Approach Vol, veh/h		899			150			1969			2423	
Approach Delay, s/veh		158.1			23.7			112.8			299.0	
Approach LOS		F			C			F			F	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.9	47.1		33.0	11.0	46.0		33.0
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0
Max Green Setting (Gmax), s	5.0	40.0		27.0	5.0	40.0		27.0
Max Q Clear Time (g_c+I1), s	5.1	44.1		30.0	6.5	43.0		9.9
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	0.0		0.7

Intersection Summary	
HCM 6th Ctrl Delay	200.7
HCM 6th LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	252	34	147	67	20	117	103	1572	41	185	1717	246
Future Volume (veh/h)	252	34	147	67	20	117	103	1572	41	185	1717	246
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1707	1707	1707	1633	1633	1633	1752	1752	1752	1707	1707	1707
Adj Flow Rate, veh/h	252	34	147	67	20	117	103	1572	41	185	1717	246
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	13	13	13	18	18	18	10	10	10	13	13	13
Cap, veh/h	245	24	106	324	417	354	111	1547	40	181	1461	204
Arrive On Green	0.26	0.26	0.26	0.26	0.26	0.26	0.07	0.47	0.47	0.11	0.51	0.51
Sat Flow, veh/h	710	96	414	1051	1633	1384	1668	3314	86	1626	2858	400
Grp Volume(v), veh/h	433	0	0	67	20	117	103	788	825	185	956	1007
Grp Sat Flow(s),veh/h/ln	1220	0	0	1051	1633	1384	1668	1664	1736	1626	1622	1635
Q Serve(g_s), s	22.2	0.0	0.0	0.0	0.8	6.2	5.5	42.0	42.0	10.0	46.0	46.0
Cycle Q Clear(g_c), s	23.0	0.0	0.0	5.1	0.8	6.2	5.5	42.0	42.0	10.0	46.0	46.0
Prop In Lane	0.58		0.34	1.00		1.00	1.00		0.05	1.00		0.24
Lane Grp Cap(c), veh/h	375	0	0	324	417	354	111	777	810	181	829	836
V/C Ratio(X)	1.15	0.00	0.00	0.21	0.05	0.33	0.93	1.01	1.02	1.02	1.15	1.20
Avail Cap(c_a), veh/h	375	0	0	324	417	354	111	777	810	181	829	836
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.8	0.0	0.0	26.8	25.2	27.2	41.8	24.0	24.0	40.0	22.0	22.0
Incr Delay (d2), s/veh	95.5	0.0	0.0	0.3	0.0	0.5	62.3	35.9	36.3	73.4	82.7	103.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	18.1	0.0	0.0	1.1	0.3	2.0	4.0	21.3	22.4	7.4	33.0	38.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	131.3	0.0	0.0	27.1	25.3	27.8	104.1	59.9	60.3	113.4	104.7	125.3
LnGrp LOS	F	A	A	C	C	C	F	F	F	F	F	F
Approach Vol, veh/h		433			204			1716			2148	
Approach Delay, s/veh		131.3			27.3			62.8			115.1	
Approach LOS		F			C			E			F	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	15.0	47.0		28.0	11.0	51.0		28.0				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	9.0	41.0		22.0	5.0	45.0		22.0				
Max Q Clear Time (g_c+I1), s	12.0	44.0		25.0	7.5	48.0		8.2				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	0.0		0.6				

Intersection Summary			
HCM 6th Ctrl Delay			92.7
HCM 6th LOS			F

Intersection	
Int Delay, s/veh	1.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	3	149	1402	9	98	1808
Future Vol, veh/h	3	149	1402	9	98	1808
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	200	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	32	32	9	9	12	12
Mvmt Flow	3	149	1402	9	98	1808

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2507	706	0	0	1411	0
Stage 1	1407	-	-	-	-	-
Stage 2	1100	-	-	-	-	-
Critical Hdwy	7.44	7.54	-	-	4.34	-
Critical Hdwy Stg 1	6.44	-	-	-	-	-
Critical Hdwy Stg 2	6.44	-	-	-	-	-
Follow-up Hdwy	3.82	3.62	-	-	2.32	-
Pot Cap-1 Maneuver	15	317	-	-	431	-
Stage 1	146	-	-	-	-	-
Stage 2	223	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	12	317	-	-	431	-
Mov Cap-2 Maneuver	78	-	-	-	-	-
Stage 1	146	-	-	-	-	-
Stage 2	172	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	28.9	0	0.8
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	299	431	-
HCM Lane V/C Ratio	-	-	0.508	0.227	-
HCM Control Delay (s)	-	-	28.9	15.8	-
HCM Lane LOS	-	-	D	C	-
HCM 95th %tile Q(veh)	-	-	2.7	0.9	-

Movement	EBL	EBR	NBU	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (veh/h)	31	163	2	102	1371	1754	83
Future Volume (veh/h)	31	163	2	102	1371	1754	83
Initial Q (Qb), veh	0	0		0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00			1.00
Parking Bus, Adj	1.00	1.00		1.00	1.00	1.00	1.00
Work Zone On Approach	No				No	No	
Adj Sat Flow, veh/h/ln	1870	1870		1870	1870	1870	1870
Adj Flow Rate, veh/h	31	163		102	1371	1754	83
Peak Hour Factor	1.00	1.00		1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2		2	2	2	2
Cap, veh/h	246	219		149	2632	2123	100
Arrive On Green	0.14	0.14		0.08	0.74	0.61	0.61
Sat Flow, veh/h	1781	1585		1781	3647	3549	162
Grp Volume(v), veh/h	31	163		102	1371	896	941
Grp Sat Flow(s),veh/h/ln	1781	1585		1781	1777	1777	1841
Q Serve(g_s), s	1.3	8.1		4.6	13.4	32.3	33.2
Cycle Q Clear(g_c), s	1.3	8.1		4.6	13.4	32.3	33.2
Prop In Lane	1.00	1.00		1.00			0.09
Lane Grp Cap(c), veh/h	246	219		149	2632	1092	1131
V/C Ratio(X)	0.13	0.75		0.68	0.52	0.82	0.83
Avail Cap(c_a), veh/h	411	366		149	2632	1092	1131
HCM Platoon Ratio	1.00	1.00		1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00		1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.1	34.1		36.7	4.5	12.4	12.5
Incr Delay (d2), s/veh	0.2	5.0		12.1	0.7	7.0	7.2
Initial Q Delay(d3),s/veh	0.0	0.0		0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	7.2		2.5	3.7	12.8	13.7
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	31.4	39.1		48.8	5.3	19.3	19.7
LnGrp LOS	C	D		D	A	B	B
Approach Vol, veh/h	194				1473	1837	
Approach Delay, s/veh	37.9				8.3	19.5	
Approach LOS	D				A	B	

Timer - Assigned Phs		2		4	5	6	
Phs Duration (G+Y+Rc), s		66.0		16.4	10.4	55.6	
Change Period (Y+Rc), s		6.0		6.0	4.5	6.0	
Max Green Setting (Gmax), s		60.0		18.0	5.9	49.6	
Max Q Clear Time (g_c+I1), s		15.4		10.1	6.6	35.2	
Green Ext Time (p_c), s		15.0		0.3	0.0	10.9	

Intersection Summary							
HCM 6th Ctrl Delay			15.8				
HCM 6th LOS			B				

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	253	48	74	51	6	6	28	1135	44	22	1282	249
Future Volume (veh/h)	253	48	74	51	6	6	28	1135	44	22	1282	249
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1648	1648	1648	1826	1826	1826	1737	1737	1737	1678	1678	1678
Adj Flow Rate, veh/h	253	48	74	51	6	6	28	1135	44	22	1282	249
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	17	17	17	5	5	5	11	11	11	15	15	15
Cap, veh/h	346	130	201	216	25	20	56	2016	78	48	1650	317
Arrive On Green	0.22	0.22	0.22	0.22	0.22	0.22	0.07	1.00	1.00	0.03	0.62	0.62
Sat Flow, veh/h	1236	585	901	726	114	88	1654	3239	126	1598	2667	512
Grp Volume(v), veh/h	253	0	122	63	0	0	28	578	601	22	761	770
Grp Sat Flow(s),veh/h/ln	1236	0	1486	928	0	0	1654	1650	1714	1598	1594	1585
Q Serve(g_s), s	9.9	0.0	8.3	4.5	0.0	0.0	2.0	0.0	0.0	1.6	41.8	43.2
Cycle Q Clear(g_c), s	22.7	0.0	8.3	12.8	0.0	0.0	2.0	0.0	0.0	1.6	41.8	43.2
Prop In Lane	1.00		0.61	0.81		0.10	1.00		0.07	1.00		0.32
Lane Grp Cap(c), veh/h	346	0	331	261	0	0	56	1027	1067	48	986	981
V/C Ratio(X)	0.73	0.00	0.37	0.24	0.00	0.00	0.50	0.56	0.56	0.46	0.77	0.79
Avail Cap(c_a), veh/h	411	0	409	329	0	0	83	1027	1067	80	986	981
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.50	0.50	0.50
Uniform Delay (d), s/veh	44.9	0.0	39.5	43.8	0.0	0.0	55.0	0.0	0.0	57.2	16.7	17.0
Incr Delay (d2), s/veh	5.4	0.0	0.7	0.5	0.0	0.0	6.9	2.2	2.2	3.4	3.0	3.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.8	0.0	3.2	1.7	0.0	0.0	0.9	0.6	0.6	0.7	13.5	13.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.3	0.0	40.2	44.3	0.0	0.0	61.9	2.2	2.2	60.6	19.7	20.2
LnGrp LOS	D	A	D	D	A	A	E	A	A	E	B	C
Approach Vol, veh/h		375			63			1207			1553	
Approach Delay, s/veh		47.0			44.3			3.6			20.5	
Approach LOS		D			D			A			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.6	79.7		31.7	9.0	79.3		31.7				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	5.0	65.0		32.0	5.0	65.0		32.0				
Max Q Clear Time (g_c+I1), s	3.6	2.0		24.7	4.0	45.2		14.8				
Green Ext Time (p_c), s	0.0	8.5		1.0	0.0	9.8		0.2				
Intersection Summary												
HCM 6th Ctrl Delay			17.7									
HCM 6th LOS			B									
Notes												

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	35	1187	7	9	1397
Future Vol, veh/h	0	35	1187	7	9	1397
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	35	1187	7	9	1397

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	597	0	0	1194	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	4.14	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	0	446	-	-	580	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	446	-	-	580	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.8	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	446	580	-
HCM Lane V/C Ratio	-	-	0.078	0.016	-
HCM Control Delay (s)	-	-	13.8	11.3	-
HCM Lane LOS	-	-	B	B	-
HCM 95th %tile Q(veh)	-	-	0.3	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	170	423	184	76	175	115	132	819	82	113	1099	156
Future Volume (veh/h)	170	423	184	76	175	115	132	819	82	113	1099	156
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1767	1767	1767	1604	1604	1604	1767	1767	1767	1781	1781	1781
Adj Flow Rate, veh/h	170	423	184	76	175	115	132	819	82	113	1099	156
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	9	9	9	20	20	20	9	9	9	8	8	8
Cap, veh/h	210	468	396	105	376	234	169	1274	127	147	1352	603
Arrive On Green	0.12	0.26	0.26	0.07	0.21	0.21	0.10	0.41	0.41	0.17	0.80	0.80
Sat Flow, veh/h	1682	1767	1497	1527	1803	1122	1682	3081	308	1697	3385	1510
Grp Volume(v), veh/h	170	423	184	76	146	144	132	446	455	113	1099	156
Grp Sat Flow(s),veh/h/ln	1682	1767	1497	1527	1523	1402	1682	1678	1711	1697	1692	1510
Q Serve(g_s), s	11.8	27.8	12.4	5.9	10.1	10.8	9.2	25.5	25.5	7.6	22.3	3.1
Cycle Q Clear(g_c), s	11.8	27.8	12.4	5.9	10.1	10.8	9.2	25.5	25.5	7.6	22.3	3.1
Prop In Lane	1.00		1.00	1.00		0.80	1.00		0.18	1.00		1.00
Lane Grp Cap(c), veh/h	210	468	396	105	318	292	169	694	707	147	1352	603
V/C Ratio(X)	0.81	0.90	0.46	0.73	0.46	0.49	0.78	0.64	0.64	0.77	0.81	0.26
Avail Cap(c_a), veh/h	294	501	424	115	318	292	182	694	707	156	1352	603
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.1	42.7	37.0	54.8	41.6	41.9	52.7	28.1	28.1	48.4	9.5	7.6
Incr Delay (d2), s/veh	10.9	19.1	0.8	18.6	1.0	1.3	18.1	4.5	4.5	19.5	5.4	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5	14.1	4.5	2.7	3.8	3.7	4.6	10.3	10.5	3.7	4.3	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	62.1	61.8	37.8	73.4	42.6	43.2	70.7	32.7	32.6	67.9	14.9	8.6
LnGrp LOS	E	E	D	E	D	D	E	C	C	E	B	A
Approach Vol, veh/h		777			366			1033			1368	
Approach Delay, s/veh		56.2			49.2			37.5			18.6	
Approach LOS		E			D			D			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	15.4	54.6	13.2	36.8	17.1	52.9	20.0	30.0				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	10.0	45.0	8.0	33.0	12.0	43.0	20.0	21.0				
Max Q Clear Time (g_c+I1), s	9.6	27.5	7.9	29.8	11.2	24.3	13.8	12.8				
Green Ext Time (p_c), s	0.0	4.6	0.0	1.0	0.0	7.2	0.2	0.9				
Intersection Summary												
HCM 6th Ctrl Delay			35.5									
HCM 6th LOS			D									

Intersection	
Int Delay, s/veh	6.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	54	103	73	41	59	12
Future Vol, veh/h	54	103	73	41	59	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	50	50	50	50	50	50
Mvmt Flow	54	103	73	41	59	12

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	224	94	0	0	114	0
Stage 1	94	-	-	-	-	-
Stage 2	130	-	-	-	-	-
Critical Hdwy	6.9	6.7	-	-	4.6	-
Critical Hdwy Stg 1	5.9	-	-	-	-	-
Critical Hdwy Stg 2	5.9	-	-	-	-	-
Follow-up Hdwy	3.95	3.75	-	-	2.65	-
Pot Cap-1 Maneuver	669	846	-	-	1224	-
Stage 1	822	-	-	-	-	-
Stage 2	790	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	636	846	-	-	1224	-
Mov Cap-2 Maneuver	636	-	-	-	-	-
Stage 1	822	-	-	-	-	-
Stage 2	751	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11	0	6.7
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	760	1224	-
HCM Lane V/C Ratio	-	-	0.207	0.048	-
HCM Control Delay (s)	-	-	11	8.1	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.8	0.2	-

Intersection						
Int Delay, s/veh	3.2					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	275	146	75	208	81	94
Future Vol, veh/h	275	146	75	208	81	94
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	200	-	200	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	275	146	75	208	81	94

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	421	0	706	348
Stage 1	-	-	-	-	348	-
Stage 2	-	-	-	-	358	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1138	-	402	695
Stage 1	-	-	-	-	715	-
Stage 2	-	-	-	-	707	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1138	-	375	695
Mov Cap-2 Maneuver	-	-	-	-	484	-
Stage 1	-	-	-	-	715	-
Stage 2	-	-	-	-	660	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.2	12.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	484	695	-	-	1138	-
HCM Lane V/C Ratio	0.167	0.135	-	-	0.066	-
HCM Control Delay (s)	13.9	11	-	-	8.4	-
HCM Lane LOS	B	B	-	-	A	-
HCM 95th %tile Q(veh)	0.6	0.5	-	-	0.2	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	379	8	752	0	0	0	0	1329	684	426	1643	0
Future Volume (veh/h)	379	8	752	0	0	0	0	1329	684	426	1643	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1693	1693	1693				0	1574	1574	1796	1796	0
Adj Flow Rate, veh/h	255	0	890				0	1329	684	426	1643	0
Peak Hour Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	14	14	14				0	22	22	7	7	0
Cap, veh/h	501	0	892				0	1623	504	479	2833	0
Arrive On Green	0.31	0.00	0.31				0.00	0.38	0.38	0.14	0.58	0.00
Sat Flow, veh/h	1612	0	2869				0	4439	1334	3319	5065	0
Grp Volume(v), veh/h	255	0	890				0	1329	684	426	1643	0
Grp Sat Flow(s),veh/h/ln	1612	0	1434				0	1432	1334	1659	1635	0
Q Serve(g_s), s	11.7	0.0	27.9				0.0	25.1	34.0	11.3	19.1	0.0
Cycle Q Clear(g_c), s	11.7	0.0	27.9				0.0	25.1	34.0	11.3	19.1	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	501	0	892				0	1623	504	479	2833	0
V/C Ratio(X)	0.51	0.00	1.00				0.00	0.82	1.36	0.89	0.58	0.00
Avail Cap(c_a), veh/h	501	0	892				0	1623	504	479	2833	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	25.4	0.0	31.0				0.0	25.2	28.0	37.8	12.1	0.0
Incr Delay (d2), s/veh	0.8	0.0	29.4				0.0	4.7	173.4	18.2	0.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.5	0.0	12.9				0.0	8.1	33.6	5.5	5.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.2	0.0	60.4				0.0	30.0	201.4	55.9	12.9	0.0
LnGrp LOS	C	A	E				A	C	F	E	B	A
Approach Vol, veh/h		1145						2013			2069	
Approach Delay, s/veh		52.8						88.2			21.8	
Approach LOS		D						F			C	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	18.0	39.0		33.0		57.0
Change Period (Y+Rc), s	6.0	6.0		6.0		6.0
Max Green Setting (Gmax), s	12.0	33.0		27.0		51.0
Max Q Clear Time (g_c+I1), s	13.3	36.0		29.9		21.1
Green Ext Time (p_c), s	0.0	0.0		0.0		13.2

Intersection Summary			
HCM 6th Ctrl Delay			54.2
HCM 6th LOS			D

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	424	21	135	38	29	61	142	1459	32	44	1765	569
Future Volume (veh/h)	424	21	135	38	29	61	142	1459	32	44	1765	569
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1693	1693	1693	1455	1455	1455	1500	1500	1500	1722	1722	1722
Adj Flow Rate, veh/h	424	21	135	38	29	61	142	1459	32	44	1765	569
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	14	14	14	30	30	30	27	27	27	12	12	12
Cap, veh/h	632	410	348	306	335	299	182	2207	48	81	2148	667
Arrive On Green	0.24	0.24	0.24	0.24	0.24	0.24	0.13	0.54	0.54	0.05	0.46	0.46
Sat Flow, veh/h	2294	1693	1434	958	1383	1233	1428	4123	90	1640	4701	1459
Grp Volume(v), veh/h	424	21	135	38	29	61	142	966	525	44	1765	569
Grp Sat Flow(s),veh/h/ln	1147	1693	1434	958	1383	1233	1428	1365	1484	1640	1567	1459
Q Serve(g_s), s	15.7	0.8	6.8	2.7	1.4	3.4	8.3	22.1	22.1	2.3	28.3	30.1
Cycle Q Clear(g_c), s	19.1	0.8	6.8	3.6	1.4	3.4	8.3	22.1	22.1	2.3	28.3	30.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.06	1.00		1.00
Lane Grp Cap(c), veh/h	632	410	348	306	335	299	182	1461	794	81	2148	667
V/C Ratio(X)	0.67	0.05	0.39	0.12	0.09	0.20	0.78	0.66	0.66	0.54	0.82	0.85
Avail Cap(c_a), veh/h	632	410	348	306	335	299	214	1481	805	133	2225	691
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.8	25.2	27.5	26.5	25.4	26.2	36.6	14.5	14.5	40.2	20.5	20.9
Incr Delay (d2), s/veh	2.8	0.1	0.7	0.2	0.1	0.3	14.3	1.1	2.0	5.6	2.5	9.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.3	0.3	2.3	0.6	0.4	1.0	3.4	5.6	6.3	1.0	9.0	10.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.5	25.2	28.2	26.7	25.5	26.5	51.0	15.6	16.5	45.9	23.0	30.8
LnGrp LOS	D	C	C	C	C	C	D	B	B	D	C	C
Approach Vol, veh/h		580			128			1633			2378	
Approach Delay, s/veh		34.2			26.3			18.9			25.3	
Approach LOS		C			C			B			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.3	51.4		26.0	16.1	44.6		26.0				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	6.0	46.0		20.0	12.0	40.0		20.0				
Max Q Clear Time (g_c+I1), s	4.3	24.1		21.1	10.3	32.1		5.6				
Green Ext Time (p_c), s	0.0	9.7		0.0	0.1	6.5		0.5				
Intersection Summary												
HCM 6th Ctrl Delay			24.2									
HCM 6th LOS			C									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	349	79	125	55	74	125	100	1199	61	240	1341	295
Future Volume (veh/h)	349	79	125	55	74	125	100	1199	61	240	1341	295
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1411	1411	1411	625	625	625	1574	1574	1574	1678	1678	1678
Adj Flow Rate, veh/h	349	79	125	55	74	125	100	1199	61	240	1341	295
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	33	33	33	86	86	86	22	22	22	15	15	15
Cap, veh/h	323	176	278	173	224	189	117	1334	68	250	1491	328
Arrive On Green	0.36	0.36	0.36	0.36	0.36	0.36	0.08	0.32	0.32	0.16	0.40	0.40
Sat Flow, veh/h	893	492	779	394	625	530	1499	4187	213	1598	3757	826
Grp Volume(v), veh/h	349	0	204	55	74	125	100	820	440	240	1090	546
Grp Sat Flow(s),veh/h/ln	893	0	1271	394	625	530	1499	1432	1536	1598	1527	1529
Q Serve(g_s), s	24.3	0.0	11.0	11.1	7.7	17.8	5.9	24.5	24.5	13.3	30.0	30.0
Cycle Q Clear(g_c), s	32.0	0.0	11.0	22.1	7.7	17.8	5.9	24.5	24.5	13.3	30.0	30.0
Prop In Lane	1.00		0.61	1.00		1.00	1.00		0.14	1.00		0.54
Lane Grp Cap(c), veh/h	323	0	454	173	224	189	117	913	489	250	1212	607
V/C Ratio(X)	1.08	0.00	0.45	0.32	0.33	0.66	0.85	0.90	0.90	0.96	0.90	0.90
Avail Cap(c_a), veh/h	323	0	454	173	224	189	117	928	497	250	1228	615
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.6	0.0	22.0	30.5	21.0	24.2	40.8	29.1	29.1	37.5	25.3	25.3
Incr Delay (d2), s/veh	73.7	0.0	0.7	1.0	0.9	8.2	42.0	11.4	18.9	45.9	9.1	16.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.5	0.0	3.2	1.1	1.1	2.5	3.4	8.9	10.5	8.0	10.8	12.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	109.4	0.0	22.7	31.5	21.8	32.3	82.8	40.5	48.0	83.4	34.4	41.6
LnGrp LOS	F	A	C	C	C	C	F	D	D	F	C	D
Approach Vol, veh/h		553			254			1360			1876	
Approach Delay, s/veh		77.4			29.1			46.1			42.8	
Approach LOS		E			C			D			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	19.0	33.5		37.0	12.0	40.5		37.0				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	13.0	28.0		31.0	6.0	35.0		31.0				
Max Q Clear Time (g_c+I1), s	15.3	26.5		34.0	7.9	32.0		24.1				
Green Ext Time (p_c), s	0.0	1.0		0.0	0.0	2.3		0.9				
Intersection Summary												
HCM 6th Ctrl Delay			47.8									
HCM 6th LOS			D									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	632	0	690	0	0	0	0	1752	908	511	1737	0
Future Volume (veh/h)	632	0	690	0	0	0	0	1752	908	511	1737	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1767	1767	1767				0	1781	1781	1796	1796	0
Adj Flow Rate, veh/h	856	0	450				0	1752	908	511	1737	0
Peak Hour Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	9	9	9				0	8	8	7	7	0
Cap, veh/h	972	0	433				0	1891	587	516	2942	0
Arrive On Green	0.29	0.00	0.29				0.00	0.39	0.39	0.16	0.60	0.00
Sat Flow, veh/h	3365	0	1497				0	5024	1510	3319	5065	0
Grp Volume(v), veh/h	856	0	450				0	1752	908	511	1737	0
Grp Sat Flow(s),veh/h/ln	1682	0	1497				0	1621	1510	1659	1635	0
Q Serve(g_s), s	21.8	0.0	26.0				0.0	31.0	35.0	13.8	19.7	0.0
Cycle Q Clear(g_c), s	21.8	0.0	26.0				0.0	31.0	35.0	13.8	19.7	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	972	0	433				0	1891	587	516	2942	0
V/C Ratio(X)	0.88	0.00	1.04				0.00	0.93	1.55	0.99	0.59	0.00
Avail Cap(c_a), veh/h	972	0	433				0	1891	587	516	2942	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	30.5	0.0	32.0				0.0	26.3	27.5	37.9	11.1	0.0
Incr Delay (d2), s/veh	9.4	0.0	54.2				0.0	9.3	254.3	36.9	0.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.8	0.0	15.6				0.0	11.9	52.3	7.8	5.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.0	0.0	86.2				0.0	35.6	281.8	74.8	12.0	0.0
LnGrp LOS	D	A	F				A	D	F	E	B	A
Approach Vol, veh/h		1306						2660			2248	
Approach Delay, s/veh		55.9						119.7			26.3	
Approach LOS		E						F			C	

Timer - Assigned Phs	1	2	4	6
Phs Duration (G+Y+Rc), s	19.0	40.0	31.0	59.0
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	13.0	34.0	25.0	53.0
Max Q Clear Time (g_c+I1), s	15.8	37.0	28.0	21.7
Green Ext Time (p_c), s	0.0	0.0	0.0	14.6

Intersection Summary	
HCM 6th Ctrl Delay	72.5
HCM 6th LOS	E

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	566	124	209	37	31	82	86	1852	31	58	1943	422
Future Volume (veh/h)	566	124	209	37	31	82	86	1852	31	58	1943	422
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1411	1411	1411	1767	1767	1767	1707	1707	1707
Adj Flow Rate, veh/h	566	124	209	37	31	82	86	1852	31	58	1943	422
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	7	7	7	33	33	33	9	9	9	13	13	13
Cap, veh/h	563	413	350	64	144	129	127	2111	35	94	1933	600
Arrive On Green	0.17	0.23	0.23	0.05	0.11	0.11	0.08	0.43	0.43	0.06	0.41	0.41
Sat Flow, veh/h	3319	1796	1522	1344	1340	1196	1682	4885	82	1626	4661	1447
Grp Volume(v), veh/h	566	124	209	37	31	82	86	1219	664	58	1943	422
Grp Sat Flow(s),veh/h/ln	1659	1796	1522	1344	1340	1196	1682	1608	1752	1626	1554	1447
Q Serve(g_s), s	13.5	4.5	9.8	2.1	1.7	5.2	4.0	27.6	27.6	2.8	33.0	19.2
Cycle Q Clear(g_c), s	13.5	4.5	9.8	2.1	1.7	5.2	4.0	27.6	27.6	2.8	33.0	19.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.05	1.00		1.00
Lane Grp Cap(c), veh/h	563	413	350	64	144	129	127	1390	757	94	1933	600
V/C Ratio(X)	1.01	0.30	0.60	0.58	0.21	0.64	0.68	0.88	0.88	0.62	1.01	0.70
Avail Cap(c_a), veh/h	563	560	474	130	320	286	127	1390	757	123	1933	600
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.0	25.4	27.4	37.1	32.4	34.0	35.8	20.7	20.7	36.6	23.3	19.2
Incr Delay (d2), s/veh	39.2	0.4	1.6	8.0	0.7	5.1	13.5	8.1	13.7	6.4	21.7	6.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.1	1.8	3.4	0.8	0.5	1.6	2.0	9.9	12.0	1.2	13.7	6.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	72.2	25.8	29.0	45.1	33.2	39.1	49.4	28.7	34.3	43.0	45.0	26.0
LnGrp LOS	F	C	C	D	C	D	D	C	C	D	F	C
Approach Vol, veh/h		899			150			1969			2423	
Approach Delay, s/veh		55.8			39.4			31.5			41.6	
Approach LOS		E			D			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.6	39.4	7.3	23.3	11.0	38.0	17.0	13.6
Change Period (Y+Rc), s	6.0	6.0	4.5	6.0	6.0	6.0	4.5	6.0
Max Green Setting (Gmax), s	5.0	32.0	6.7	23.8	5.0	32.0	12.5	18.0
Max Q Clear Time (g_c+I1), s	4.8	29.6	4.1	11.8	6.0	35.0	15.5	7.2
Green Ext Time (p_c), s	0.0	2.0	0.0	1.0	0.0	0.0	0.0	0.3

Intersection Summary			
HCM 6th Ctrl Delay			40.2
HCM 6th LOS			D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	252	34	147	67	20	117	103	1572	41	185	1717	246
Future Volume (veh/h)	252	34	147	67	20	117	103	1572	41	185	1717	246
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1707	1707	1707	1633	1633	1633	1752	1752	1752	1707	1707	1707
Adj Flow Rate, veh/h	252	34	147	67	20	117	103	1572	41	185	1717	246
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	13	13	13	18	18	18	10	10	10	13	13	13
Cap, veh/h	369	72	313	248	423	358	116	2160	56	189	2049	292
Arrive On Green	0.26	0.26	0.26	0.26	0.26	0.26	0.07	0.45	0.45	0.12	0.50	0.50
Sat Flow, veh/h	1143	280	1210	1051	1633	1384	1668	4793	125	1626	4122	587
Grp Volume(v), veh/h	252	0	181	67	20	117	103	1046	567	185	1292	671
Grp Sat Flow(s),veh/h/ln	1143	0	1490	1051	1633	1384	1668	1594	1729	1626	1554	1602
Q Serve(g_s), s	18.3	0.0	8.8	4.9	0.8	5.9	5.3	23.1	23.1	9.8	30.8	31.2
Cycle Q Clear(g_c), s	19.1	0.0	8.8	13.8	0.8	5.9	5.3	23.1	23.1	9.8	30.8	31.2
Prop In Lane	1.00		0.81	1.00		1.00	1.00		0.07	1.00		0.37
Lane Grp Cap(c), veh/h	369	0	386	248	423	358	116	1437	779	189	1545	796
V/C Ratio(X)	0.68	0.00	0.47	0.27	0.05	0.33	0.89	0.73	0.73	0.98	0.84	0.84
Avail Cap(c_a), veh/h	379	0	398	257	437	370	116	1556	844	189	1661	856
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.1	0.0	26.9	32.7	23.9	25.8	39.7	19.3	19.3	37.9	18.6	18.7
Incr Delay (d2), s/veh	4.8	0.0	0.9	0.6	0.0	0.5	49.8	1.6	2.9	59.1	3.7	7.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.2	0.0	3.1	1.2	0.3	1.9	3.6	7.4	8.3	6.7	9.6	10.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.9	0.0	27.8	33.3	24.0	26.3	89.5	20.9	22.3	97.1	22.3	26.0
LnGrp LOS	D	A	C	C	C	C	F	C	C	F	C	C
Approach Vol, veh/h		433			204			1716			2148	
Approach Delay, s/veh		32.5			28.4			25.5			29.9	
Approach LOS		C			C			C			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	15.0	43.8		27.3	11.0	47.8		27.3				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	9.0	41.0		22.0	5.0	45.0		22.0				
Max Q Clear Time (g_c+I1), s	11.8	25.1		21.1	7.3	33.2		15.8				
Green Ext Time (p_c), s	0.0	8.7		0.2	0.0	8.6		0.4				
Intersection Summary												
HCM 6th Ctrl Delay			28.4									
HCM 6th LOS			C									

Appendix G – Cumulative Project Assumptions

1. Where Traffic Impact Studies were available, PCE volumes were added directly to the turning movements at t hose intersections analyzed for those projects.
2. All other cumulative projects were assumed to access S. Riverside Avenue through the closest side street, with 80% of traffic traveling to I-10 and the remaining traffic traveling away from I-10. So, cumulative projects located north of I-10 were assumed to have 20% of their traffic distributed northward along S Riverside Avenue and 80% to I-10 via S Riverside Avenue. Cumulative projects located south of I-10 were assumed to have 80% of their traffic accessing I-10 via S. Riverside Avenue and 20% distributed southward via S Riverside Avenue. Trip generation results for these projects were summarized in Table 7 of the report.

Appendix H – Signal Warrant Analyses

6/12/2021

Traffic Signal Warrant Analysis Workbook

STUDY AND ANALYSIS INFORMATION

Analysis Date:	2021 Cumulative Build
Conducted By:	NV5
Agency/Company Name:	NV5

Is the intersection in a built-up area of an isolated community of <10,000 population? No

Major Street Information

Major Street Name and Route Number:	Riverside Ave
Major Street Approach #1 Direction:	N-Bound
Major Street Approach #2 Direction:	S-Bound

Number of Lanes for Moving Traffic on Each Major Street Approach: 3 LANE(S)

Speed Limit or 85th Percentile Speed on the Major Street: 55 MPH

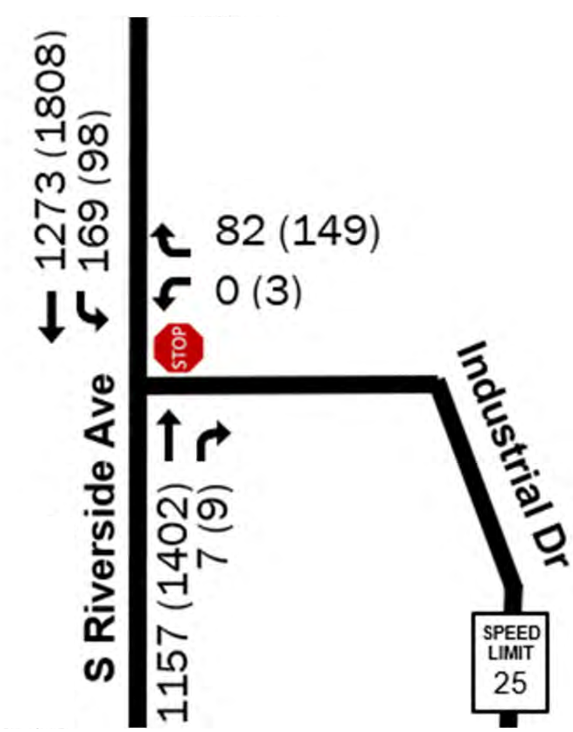
Minor Street Information

Minor Street Name and Route Number:	Industrial Drive
Minor Street Approach #1 Direction:	W-Bound
Minor Street Approach #2 Direction:	N/A

Number of Lanes for Moving Traffic on Each Minor Street Approach: 1 LANE(S)

TRAFFIC SIGNAL WARRANT ANALYSIS FINDINGS

	Applicable?	Warrant Met?
Warrant 1, Eight-Hour Vehicular Volume	Yes	No
Warrant 2, Four-Hour Vehicular Volume	Yes	No
Warrant 3, Peak Hour	Yes	Yes



MUTCD WARRANT 1, EIGHT-HOUR VEHICULAR VOLUME

Number of Lanes for Moving Traffic on Each Approach	
Major Street:	2 or More Lanes
Minor Street:	1 Lane

Built-up Isolated Community With Less Than 10,000 Population or Above 40 MPH on Major Street?	Yes

Combination of Conditions A and B Necessary?*: No

Only applicable for Warrant 1 if after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems. See Section 4C.02 of the 2009 MUTCD for application.

Condition A - Minimum Vehicular Volume

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor street approach (one direction only)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1	1	500	400	350	280	150	120	105	84
2 or More	1	600	480	420	336	150	120	105	84
2 or More	2 or More	600	480	420	336	200	160	140	112
1	2 or More	500	400	350	280	200	160	140	112

Condition B - Interruption of Continuous Traffic

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor street approach (one direction only)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1	1	750	600	525	420	75	60	53	42
2 or More	1	900	720	630	504	75	60	53	42
2 or More	2 or More	900	720	630	504	100	80	70	56
1	2 or More	750	600	525	420	100	80	70	56

Condition A Evaluation

Number of Unique Hours Met: 1 **Condition A Satisfied?** No

Condition B Evaluation

Number of Unique Hours Met: 2 **Condition B Satisfied?** No

Combination of Condition A and Condition B Evaluation

Number of Unique Hours Met for Condition A: N/A

Number of Unique Hours Met for Condition B: N/A

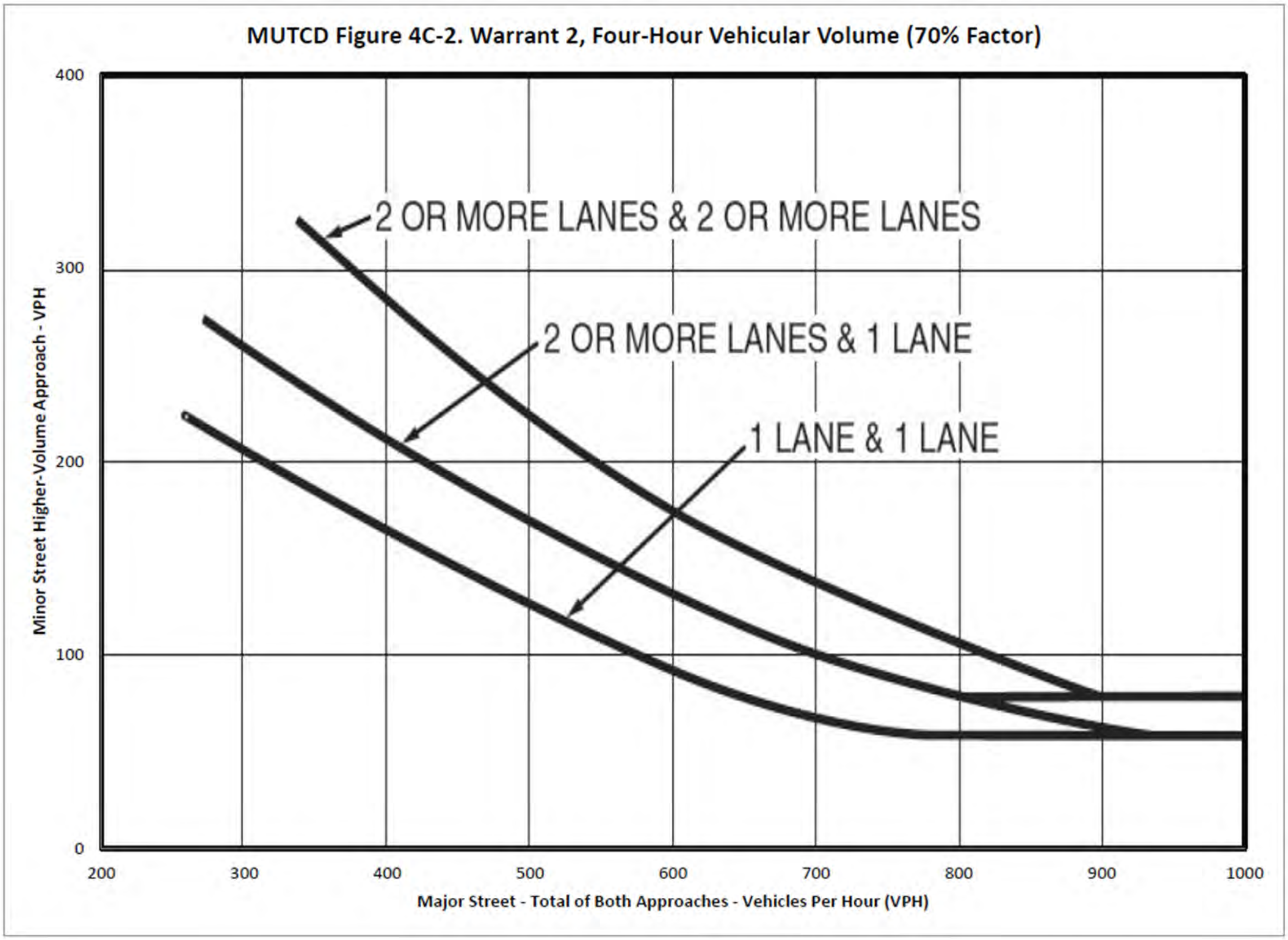
Combination of Condition A and Condition B Satisfied? N/A

MUTCD WARRANT 2, FOUR-HOUR VEHICULAR VOLUME

Number of Lanes for Moving Traffic on Each Approach	
Major Street:	2 or More Lanes
Minor Street:	1 Lane

Total Number of Unique Hours Met On Figure 4C-2
2

Built-up Isolated Community With Less Than 10,000 Population or Above 40 MPH on Major Street?	Yes



Total Major Street Traffic is greater than 1,000 vph.
Side Street Traffic is 82/152 vph in the AM/PM peak hours.

MUTCD WARRANT 3, PEAK HOUR

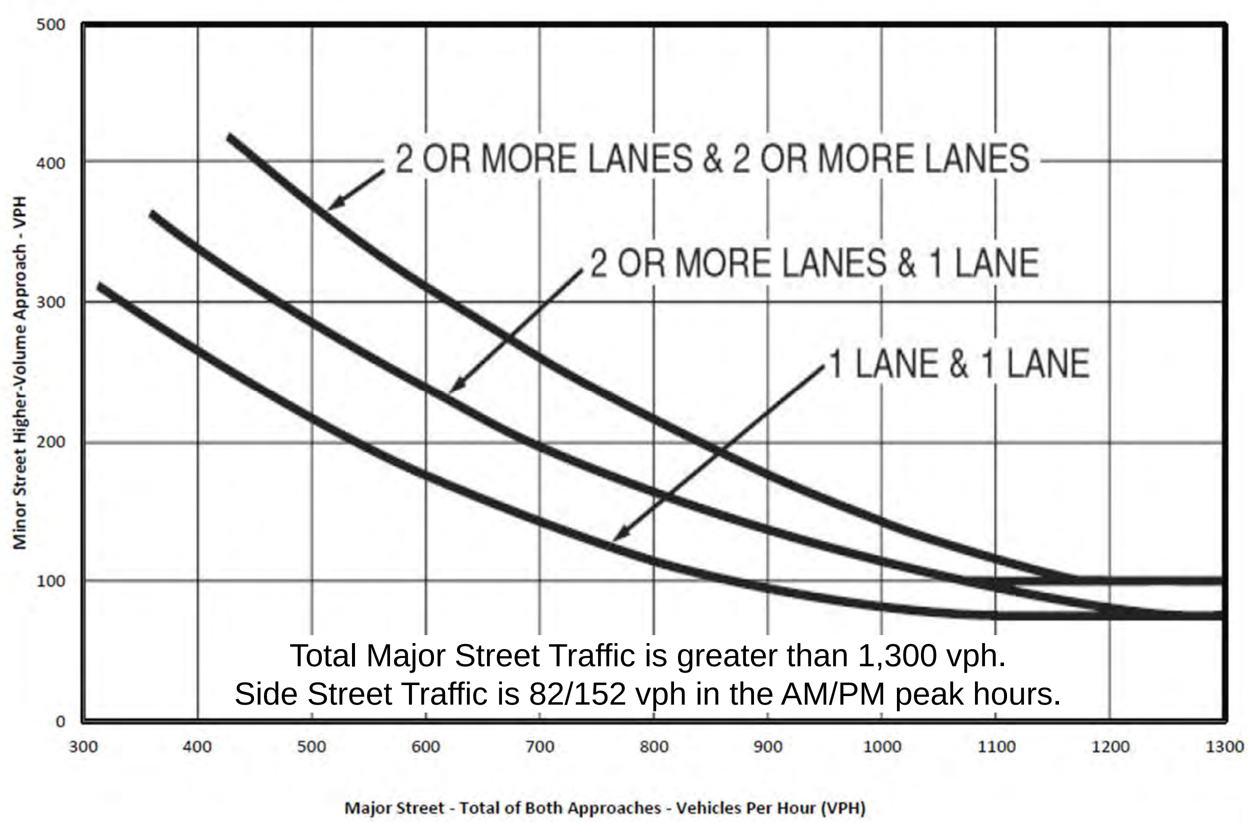
Number of Lanes for Moving Traffic on Each Approach	
Major Street:	2 or More Lanes
Minor Street:	1 Lane

Total Number of Unique Hours Met On Figure 4C-4
2

Built-up Isolated Community With Less Than 10,000 Population or Above 40 MPH on Major Street?	Yes
Is this signal warrant being applied for an unusual case, such as office complexes, manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time?	Yes

Indicate whether all three of the following conditions for the same 1 hour (any four consecutive 15-minute periods) of an average day are present*	
Does the total stopped time delay experienced by the traffic on one minor-street approach (one direction only) controlled by a STOP sign equal or exceed 4 vehicle-hours for a one-lane approach or 5 vehicle-hours for a two-lane approach?	No
Does the volume on the same minor-street approach (one direction only) equal or exceed 100 vehicles per hour for one moving lane of traffic or 150 vehicles per hour for two moving lanes?	Yes in the PM
Does the total entering volume serviced during the hour equal or exceed 650 vehicles per hour for intersection with three approaches or 800 vehicles per hour for intersections with four or more approaches?	Yes
If applicable, attach all supporting calculations and documentation.	

MUTCD Figure 4C-4. Warrant 3, Peak Hour (70% Factor)



Traffic Signal Warrant Analysis Workbook

6/12/2021

STUDY AND ANALYSIS INFORMATION

Analysis Date:	2021 Cumulative Build
Conducted By:	NV5
Agency/Company Name:	NV5

Major Street Information

Major Street Name and Route Number:	Riverside Ave
Major Street Approach #1 Direction:	N-Bound
Major Street Approach #2 Direction:	S-Bound

Number of Lanes for Moving Traffic on Each Major Street Approach:	3	LANE(S)
Speed Limit or 85th Percentile Speed on the Major Street:	55	MPH

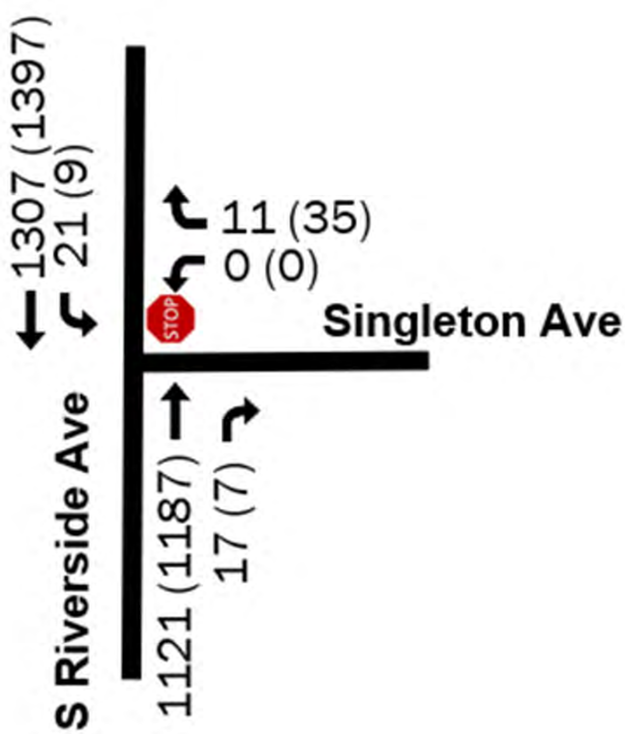
Minor Street Information

Minor Street Name and Route Number:	Singleton Ave
Minor Street Approach #1 Direction:	W-Bound
Minor Street Approach #2 Direction:	N/A

Number of Lanes for Moving Traffic on Each Minor Street Approach:	1	LANE(S)

TRAFFIC SIGNAL WARRANT ANALYSIS FINDINGS

	Applicable?	Warrant Met?
Warrant 1, Eight-Hour Vehicular Volume	Yes	No
Warrant 2, Four-Hour Vehicular Volume	Yes	No
Warrant 3, Peak Hour	Yes	No



MUTCD WARRANT 1, EIGHT-HOUR VEHICULAR VOLUME

Number of Lanes for Moving Traffic on Each Approach	
Major Street:	2 or More Lanes
Minor Street:	1 Lane

Built-up Isolated Community With Less Than 10,000 Population or Above 40 MPH on Major Street?	Yes

Combination of Conditions A and B Necessary?*: No

**Only applicable for Warrant 1 if after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems. See Section 4C.02 of the 2009 MUTCD for application.*

Condition A - Minimum Vehicular Volume

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor street approach (one direction only)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1	1	500	400	350	280	150	120	105	84
2 or More	1	600	480	420	336	150	120	105	84
2 or More	2 or More	600	480	420	336	200	160	140	112
1	2 or More	500	400	350	280	200	160	140	112

Condition B - Interruption of Continuous Traffic

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor street approach (one direction only)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1	1	750	600	525	420	75	60	53	42
2 or More	1	900	720	630	504	75	60	53	42
2 or More	2 or More	900	720	630	504	100	80	70	56
1	2 or More	750	600	525	420	100	80	70	56

Condition A Evaluation

Number of Unique Hours Met: 0

Condition A Satisfied? No

Condition B Evaluation

Number of Unique Hours Met: 0

Condition B Satisfied? No

Combination of Condition A and Condition B Evaluation

Number of Unique Hours Met for Condition A: N/A

Number of Unique Hours Met for Condition B: N/A

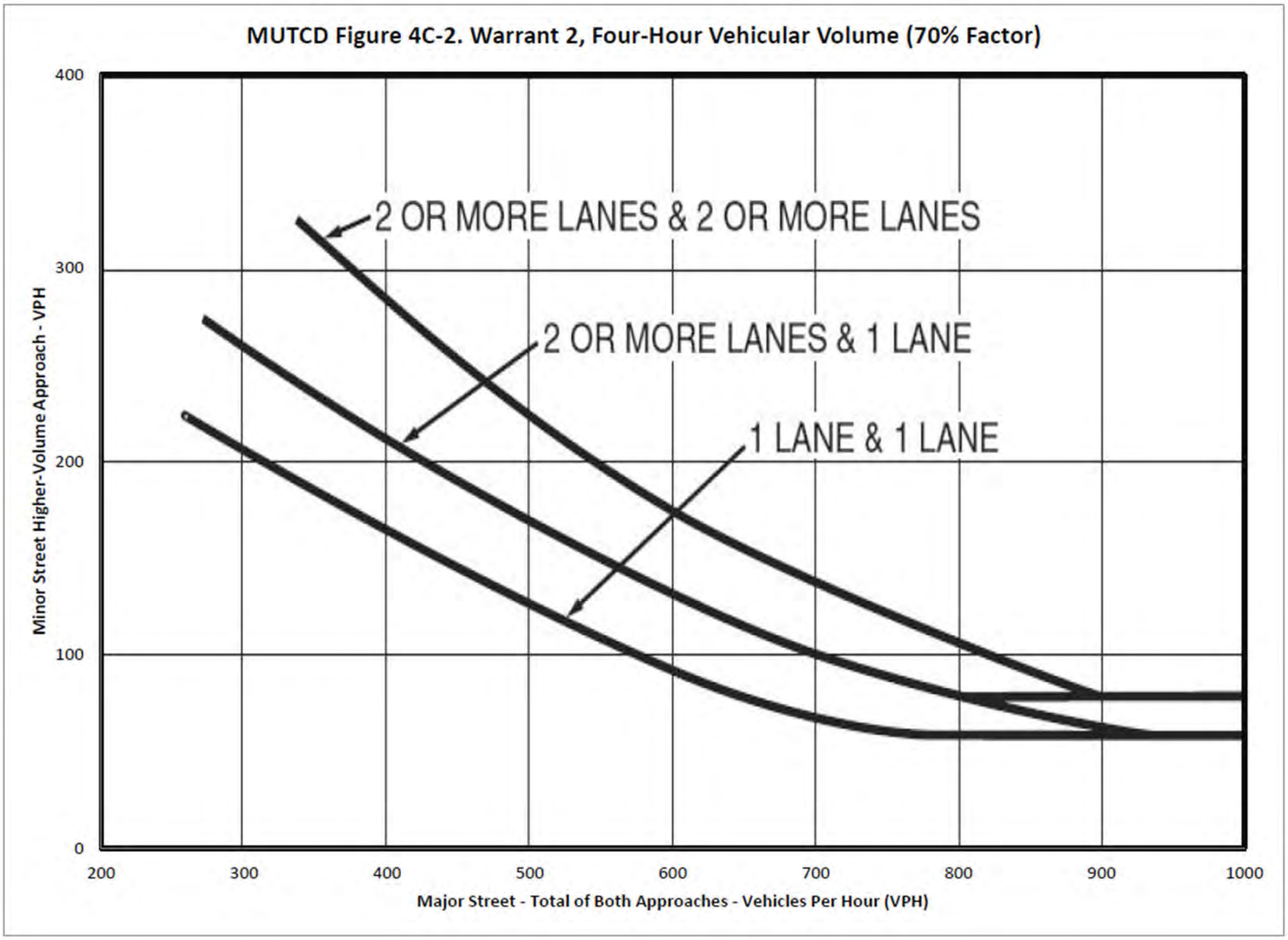
Combination of Condition A and Condition B Satisfied? N/A

MUTCD WARRANT 2, FOUR-HOUR VEHICULAR VOLUME

Number of Lanes for Moving Traffic on Each Approach	
Major Street:	2 or More Lanes
Minor Street:	1 Lane

Total Number of Unique Hours Met On Figure 4C-2
0

Built-up Isolated Community With Less Than 10,000 Population or Above 40 MPH on Major Street?	Yes



Total Major Street Traffic is greater than 1,000 vph.
Side Street Traffic is 11/34 vph in the AM/PM peak hours and are all right turns.

MUTCD WARRANT 3, PEAK HOUR

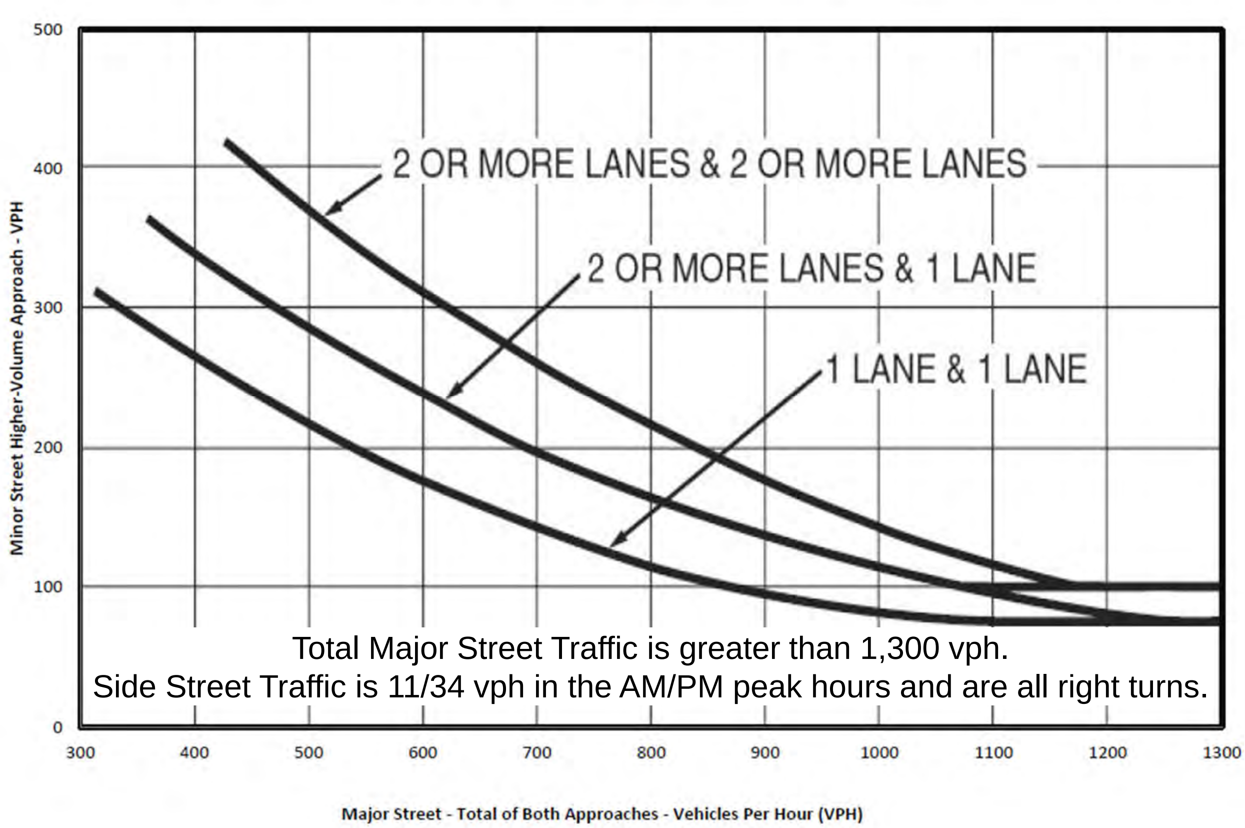
Number of Lanes for Moving Traffic on Each Approach	
Major Street:	2 or More Lanes
Minor Street:	1 Lane

Total Number of Unique Hours Met On Figure 4C-4
0

Built-up Isolated Community With Less Than 10,000 Population or Above 40 MPH on Major Street?	Yes
Is this signal warrant being applied for an unusual case, such as office complexes, manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time?	Yes

Indicate whether all three of the following conditions for the same 1 hour (any four consecutive 15-minute periods) of an average day are present*	
Does the total stopped time delay experienced by the traffic on one minor-street approach (one direction only) controlled by a STOP sign equal or exceed 4 vehicle-hours for a one-lane approach or 5 vehicle-hours for a two-lane approach?	No
Does the volume on the same minor-street approach (one direction only) equal or exceed 100 vehicles per hour for one moving lane of traffic or 150 vehicles per hour for two moving lanes?	Yes in the PM
Does the total entering volume serviced during the hour equal or exceed 650 vehicles per hour for intersection with three approaches or 800 vehicles per hour for intersections with four or more approaches?	Yes
If applicable, attach all supporting calculations and documentation.	

MUTCD Figure 4C-4. Warrant 3, Peak Hour (70% Factor)



Traffic Signal Warrant Analysis Workbook

6/12/2021

STUDY AND ANALYSIS INFORMATION

Analysis Date:	2021 Cumulative Build
Conducted By:	NV5
Agency/Company Name:	NV5

Is the intersection in a built-up area of an isolated community of <10,000 population? No

Major Street Information

Major Street Name and Route Number:	Indusrial Drive
Major Street Approach #1 Direction:	N-Bound
Major Street Approach #2 Direction:	S-Bound

Number of Lanes for Moving Traffic on Each Major Street Approach: 1 LANE(S)

Speed Limit or 85th Percentile Speed on the Major Street: 35 MPH

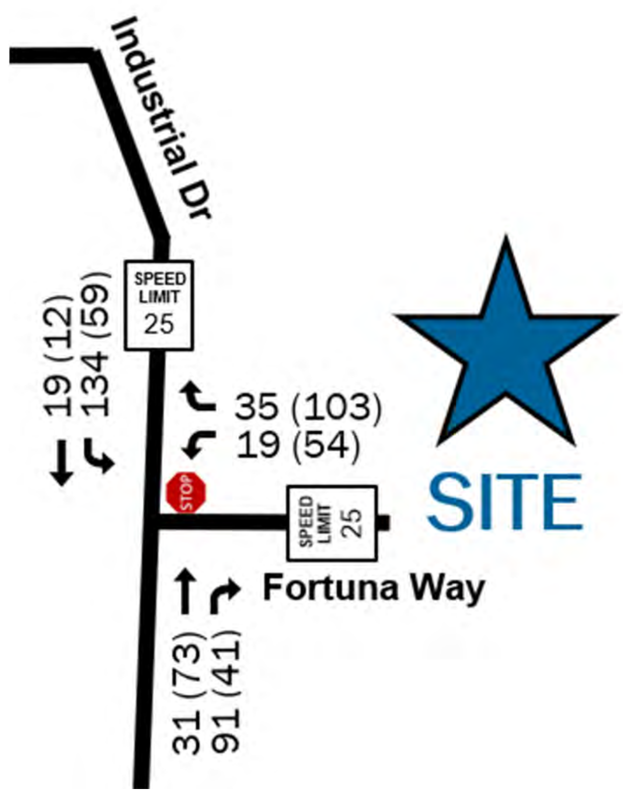
Minor Street Information

Minor Street Name and Route Number:	Fortuna Drive
Minor Street Approach #1 Direction:	W-Bound
Minor Street Approach #2 Direction:	N/A

Number of Lanes for Moving Traffic on Each Minor Street Approach: 1 LANE(S)

TRAFFIC SIGNAL WARRANT ANALYSIS FINDINGS

	Applicable?	Warrant Met?
Warrant 1, Eight-Hour Vehicular Volume	Yes	No
Warrant 2, Four-Hour Vehicular Volume	Yes	No
Warrant 3, Peak Hour	Yes	No



MUTCD WARRANT 1, EIGHT-HOUR VEHICULAR VOLUME

Number of Lanes for Moving Traffic on Each Approach	
Major Street:	1 Lane
Minor Street:	1 Lane

Built-up Isolated Community With Less Than 10,000 Population or Above 40 MPH on Major Street?	No

Combination of Conditions A and B Necessary?*: No

**Only applicable for Warrant 1 if after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems. See Section 4C.02 of the 2009 MUTCD for application.*

Condition A - Minimum Vehicular Volume									
Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor street approach (one direction only)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1	1	500	400	350	280	150	120	105	84
2 or More	1	600	480	420	336	150	120	105	84
2 or More	2 or More	600	480	420	336	200	160	140	112
1	2 or More	500	400	350	280	200	160	140	112

Condition B - Interruption of Continuous Traffic									
Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor street approach (one direction only)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1	1	750	600	525	420	75	60	53	42
2 or More	1	900	720	630	504	75	60	53	42
2 or More	2 or More	900	720	630	504	100	80	70	56
1	2 or More	750	600	525	420	100	80	70	56

Condition A Evaluation

Number of Unique Hours Met: 0 **Condition A Satisfied?** No

Condition B Evaluation

Number of Unique Hours Met: 0 **Condition B Satisfied?** No

Combination of Condition A and Condition B Evaluation

Number of Unique Hours Met for Condition A: N/A

Number of Unique Hours Met for Condition B: N/A

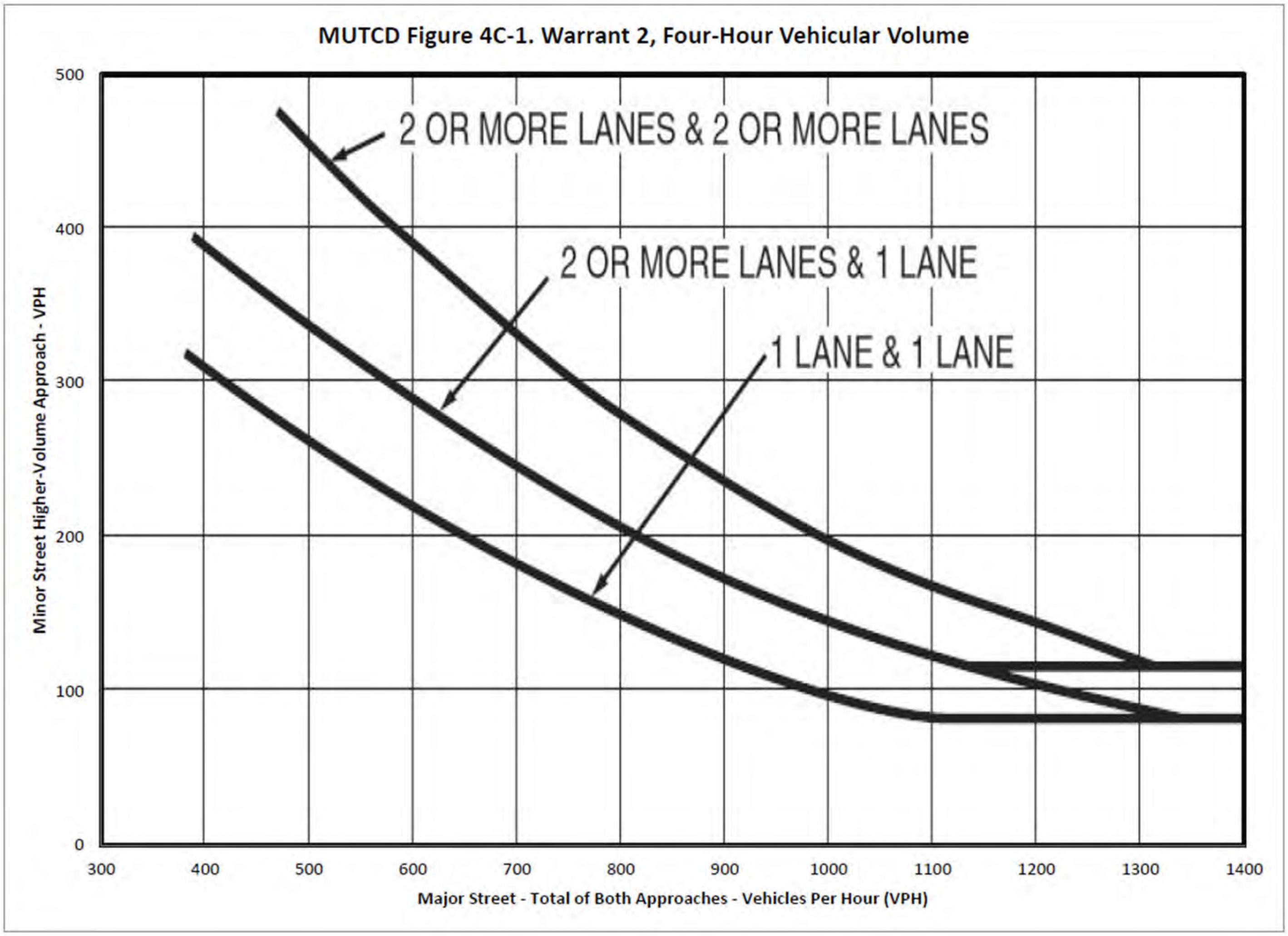
Combination of Condition A and Condition B Satisfied? N/A

MUTCD WARRANT 2, FOUR-HOUR VEHICULAR VOLUME

Number of Lanes for Moving Traffic on Each Approach	
Major Street:	1 Lane
Minor Street:	1 Lane

Total Number of Unique Hours Met On Figure 4C-1
0

Built-up Isolated Community With Less Than 10,000 Population or Above 40 MPH on Major Street?	No



Total Major Street Traffic is less than 300 vph

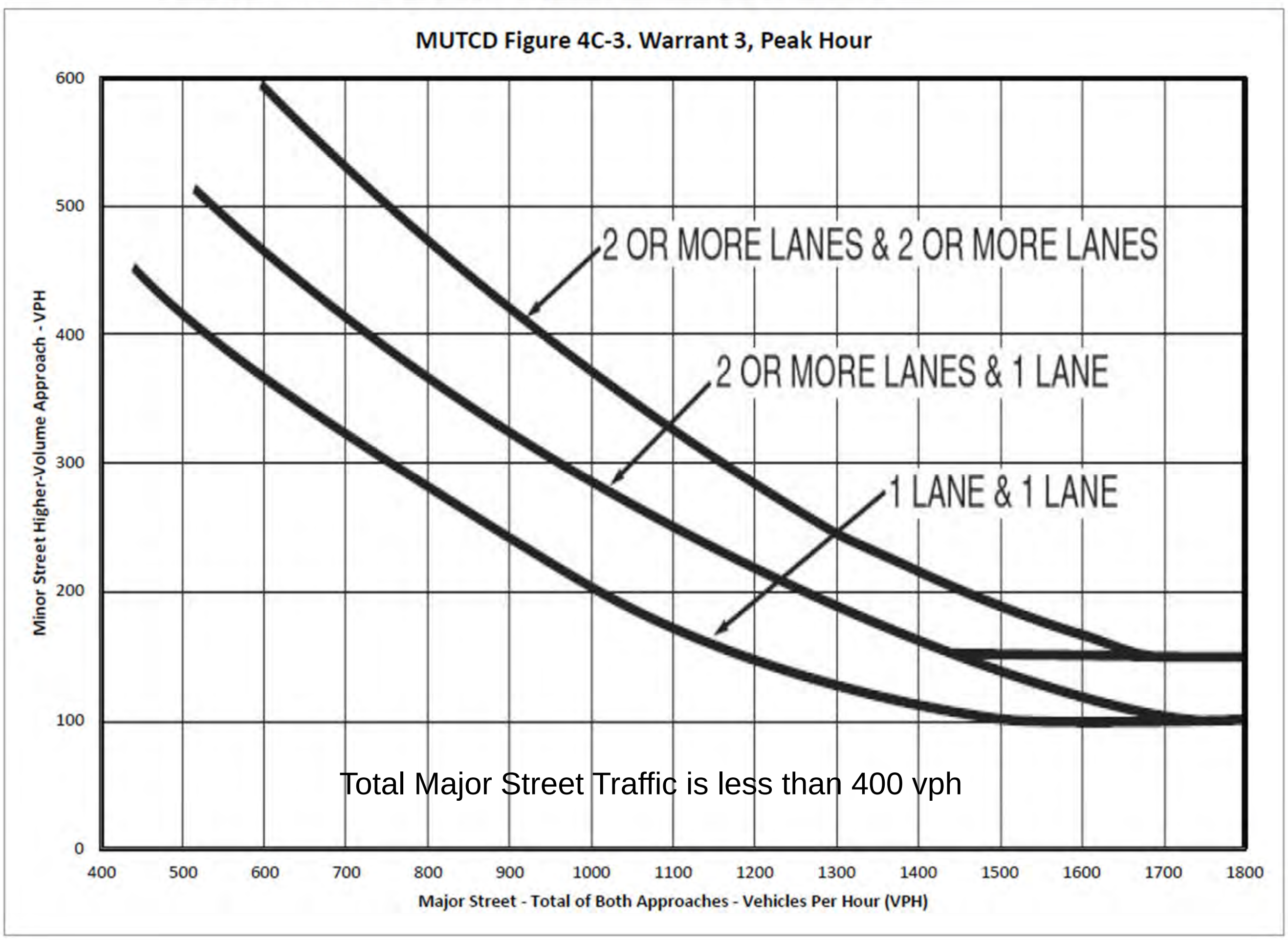
MUTCD WARRANT 3, PEAK HOUR

Number of Lanes for Moving Traffic on Each Approach	
Major Street:	1 Lane
Minor Street:	1 Lane

Total Number of Unique Hours Met On Figure 4C-3
0

Built-up Isolated Community With Less Than 10,000 Population or Above 40 MPH on Major Street?	No
Is this signal warrant being applied for an unusual case, such as office complexes, manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time?	Yes

Indicate whether all three of the following conditions for the same 1 hour (any four consecutive 15-minute periods) of an average day are present*	
Does the total stopped time delay experienced by the traffic on one minor-street approach (one direction only) controlled by a STOP sign equal or exceed 4 vehicle-hours for a one-lane approach or 5 vehicle-hours for a two-lane approach?	No
Does the volume on the same minor-street approach (one direction only) equal or exceed 100 vehicles per hour for one moving lane of traffic or 150 vehicles per hour for two moving lanes?	Yes
Does the total entering volume serviced during the hour equal or exceed 650 vehicles per hour for intersection with three approaches or 800 vehicles per hour for intersections with four or more approaches?	No
**If applicable, attach all supporting calculations and documentation.*	



6/12/2021

Traffic Signal Warrant Analysis Workbook

STUDY AND ANALYSIS INFORMATION

Analysis Date:	2021 Cumulative Build
Conducted By:	NV5
Agency/Company Name:	NV5

Is the intersection in a built-up area of an isolated community of <10,000 population? No

Major Street Information

Major Street Name and Route Number:	Industrial Drive
Major Street Approach #1 Direction:	E-Bound
Major Street Approach #2 Direction:	W-Bound

Number of Lanes for Moving Traffic on Each Major Street Approach: 1 LANE(S)
Speed Limit or 85th Percentile Speed on the Major Street: 35 MPH

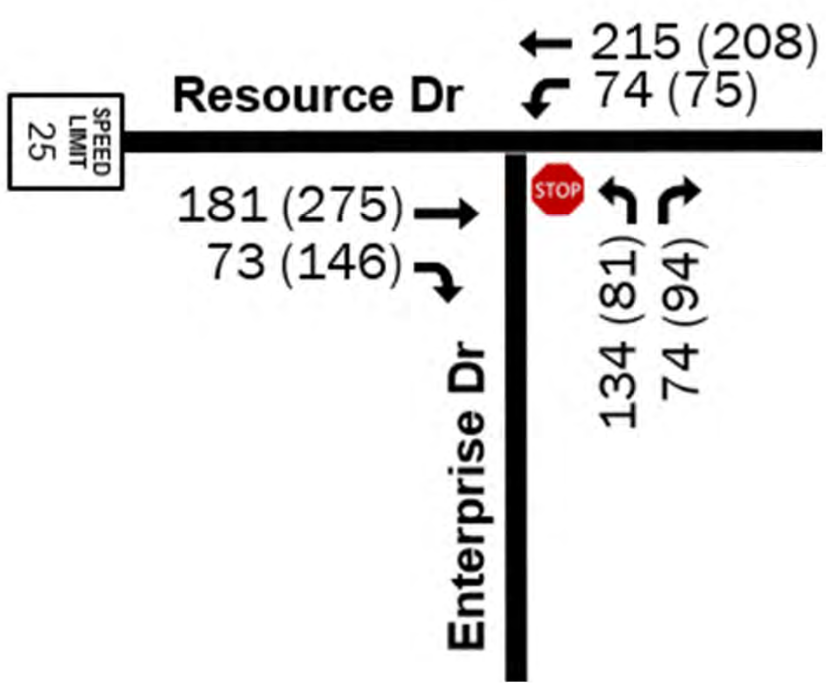
Minor Street Information

Minor Street Name and Route Number:	Resource Drive
Minor Street Approach #1 Direction:	N-Bound
Minor Street Approach #2 Direction:	N/A

Number of Lanes for Moving Traffic on Each Minor Street Approach: 2 LANE(S)

TRAFFIC SIGNAL WARRANT ANALYSIS FINDINGS

	Applicable?	Warrant Met?
Warrant 1, Eight-Hour Vehicular Volume	Yes	No
Warrant 2, Four-Hour Vehicular Volume	Yes	No
Warrant 3, Peak Hour	Yes	No



MUTCD WARRANT 1, EIGHT-HOUR VEHICULAR VOLUME

Number of Lanes for Moving Traffic on Each Approach	
Major Street:	1 Lane
Minor Street:	2 or More Lanes

Built-up Isolated Community With Less Than 10,000 Population or Above 40 MPH on Major Street?	No

Combination of Conditions A and B Necessary?*: No

Only applicable for Warrant 1 if after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems. See Section 4C.02 of the 2009 MUTCD for application.

Condition A - Minimum Vehicular Volume

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor street approach (one direction only)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1	1	500	400	350	280	150	120	105	84
2 or More	1	600	480	420	336	150	120	105	84
2 or More	2 or More	600	480	420	336	200	160	140	112
1	2 or More	500	400	350	280	200	160	140	112

Condition B - Interruption of Continuous Traffic

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor street approach (one direction only)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1	1	750	600	525	420	75	60	53	42
2 or More	1	900	720	630	504	75	60	53	42
2 or More	2 or More	900	720	630	504	100	80	70	56
1	2 or More	750	600	525	420	100	80	70	56

Condition A Evaluation

Number of Unique Hours Met: 1 **Condition A Satisfied?** No

Condition B Evaluation

Number of Unique Hours Met: 0 **Condition B Satisfied?** No

Combination of Condition A and Condition B Evaluation

Number of Unique Hours Met for Condition A: N/A

Number of Unique Hours Met for Condition B: N/A

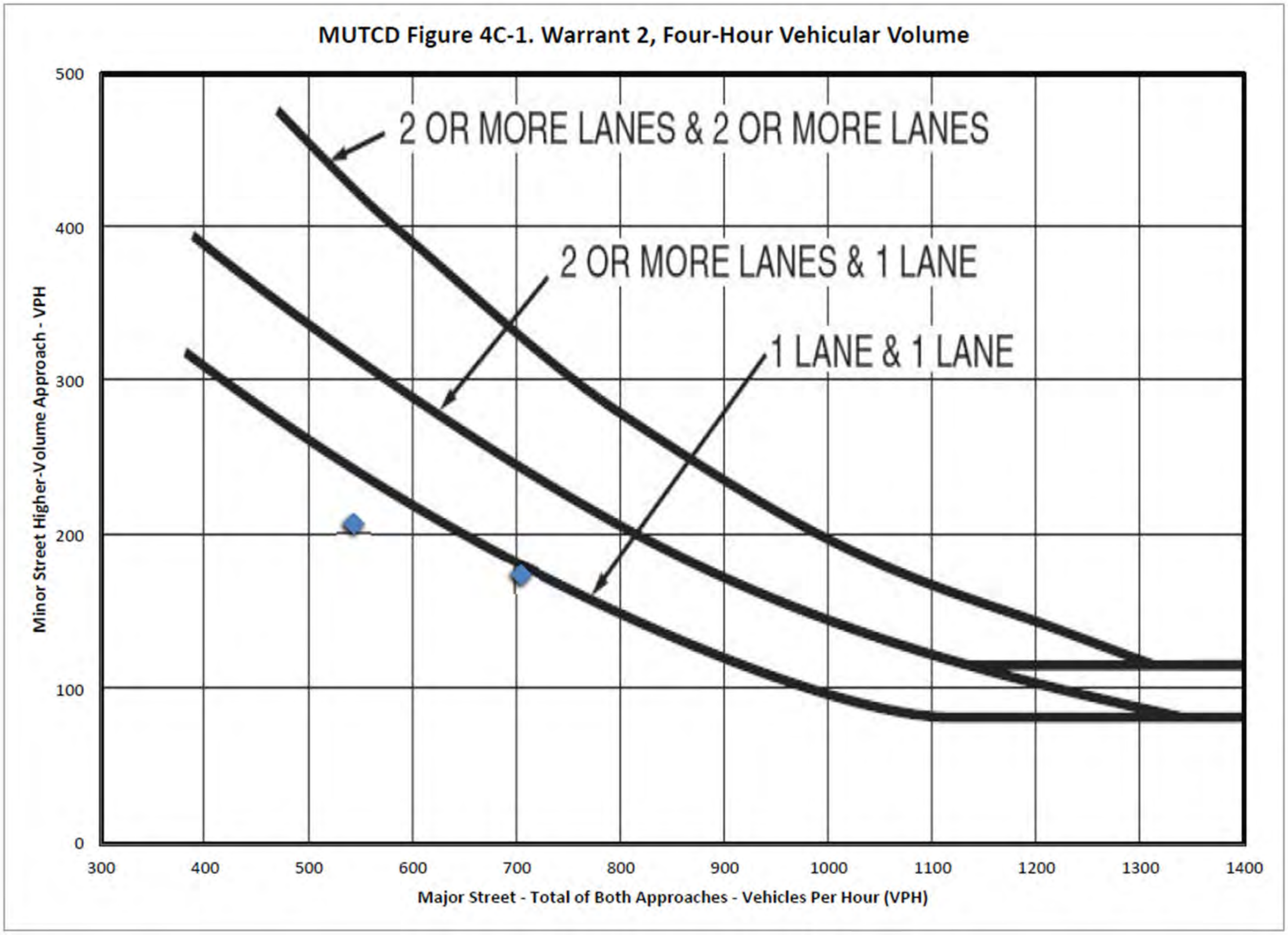
Combination of Condition A and Condition B Satisfied? N/A

MUTCD WARRANT 2, FOUR-HOUR VEHICULAR VOLUME

Number of Lanes for Moving Traffic on Each Approach	
Major Street:	1 Lane
Minor Street:	1 Lane

Total Number of Unique Hours Met On Figure 4C-1
0

Built-up Isolated Community With Less Than 10,000 Population or Above 40 MPH on Major Street?	No



MUTCD WARRANT 3, PEAK HOUR

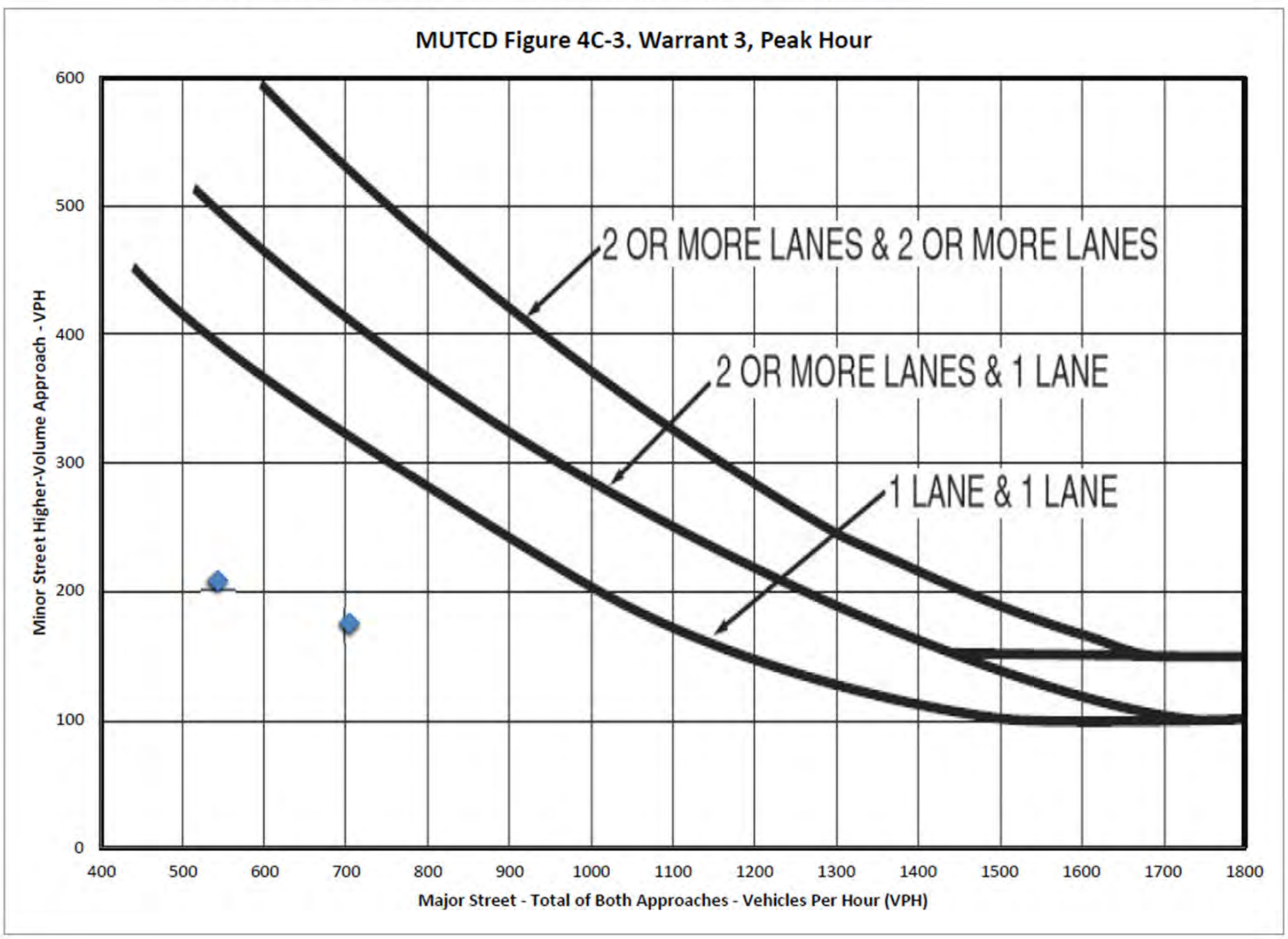
Number of Lanes for Moving Traffic on Each Approach	
Major Street:	1 Lane
Minor Street:	1 Lane

Total Number of Unique Hours Met On Figure 4C-3
0

Built-up Isolated Community With Less Than 10,000 Population or Above 40 MPH on Major Street?	No

Is this signal warrant being applied for an unusual case, such as office complexes, manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time?	Yes

Indicate whether all three of the following conditions for the same 1 hour (any four consecutive 15-minute periods) of an average day are present*	
Does the total stopped time delay experienced by the traffic on one minor-street approach (one direction only) controlled by a STOP sign equal or exceed 4 vehicle-hours for a one-lane approach or 5 vehicle-hours for a two-lane approach?	No
Does the volume on the same minor-street approach (one direction only) equal or exceed 100 vehicles per hour for one moving lane of traffic or 150 vehicles per hour for two moving lanes?	Yes
Does the total entering volume serviced during the hour equal or exceed 650 vehicles per hour for intersection with three approaches or 800 vehicles per hour for intersections with four or more approaches?	No
If applicable, attach all supporting calculations and documentation.	

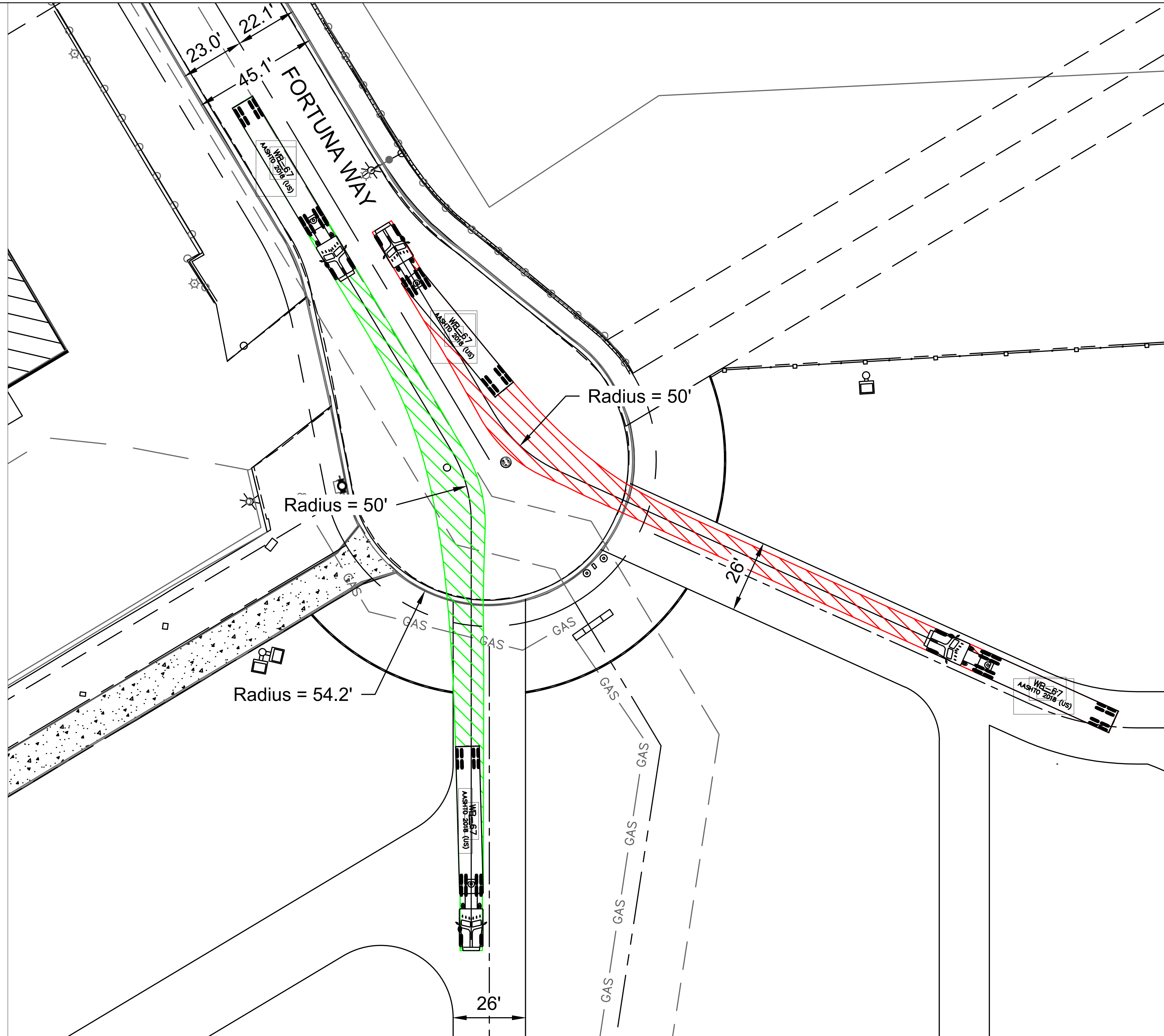


Appendix I – Truck Turning Template

LEGEND

INGRESS

EGRESS



N

0' 20' 40' 80'

GRAPHIC SCALE

1 inch = 40 ft.

DATE: 08/02/2021

DRAWN BY: AK

CHECKED BY: VG

NV5
1255 CANTON ST, SUITE G
ROSWELL, GA 30075
(678) 795-3600
WWW.NV5.COM

REVISION DATES

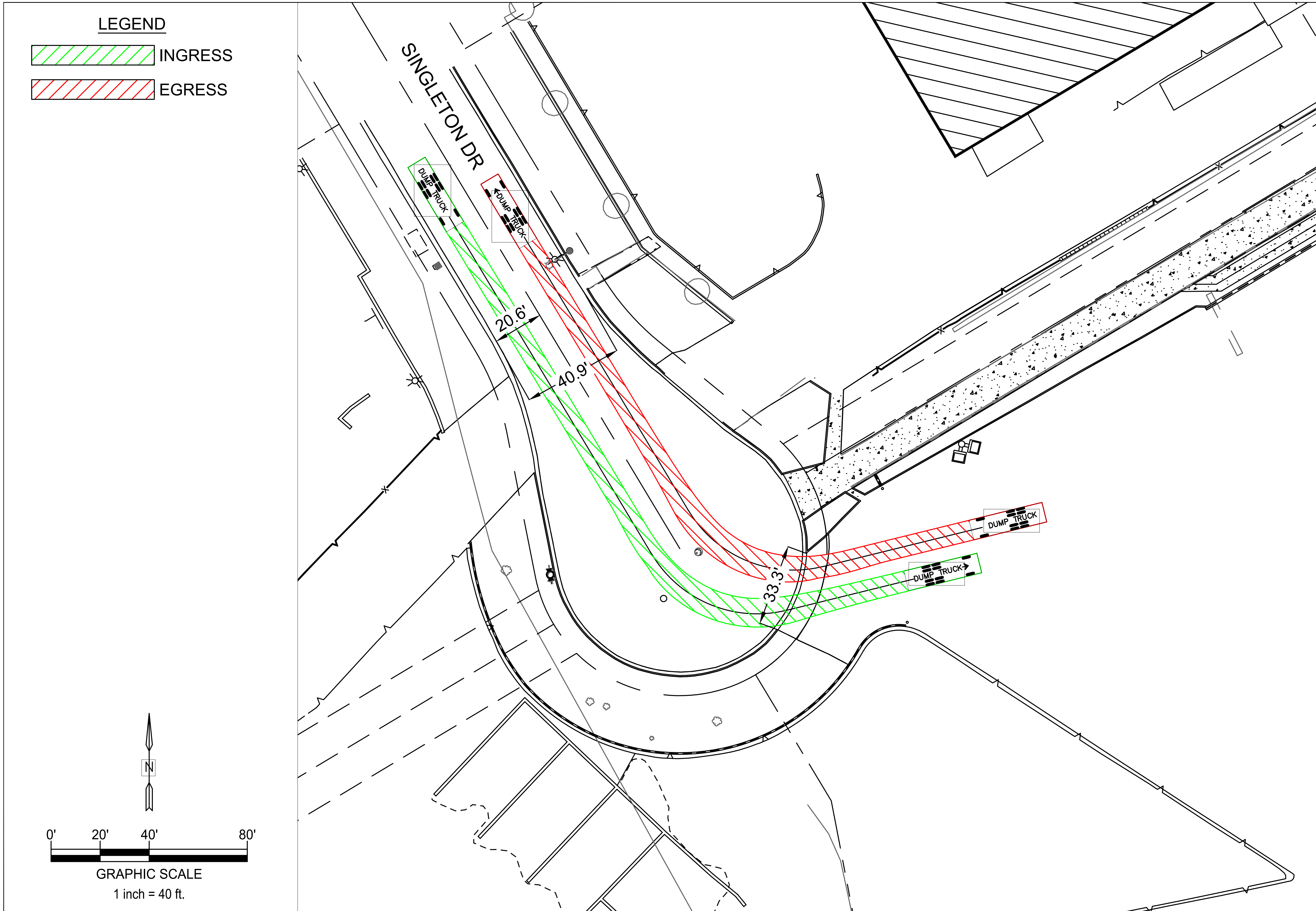
TRUCK TURNING EXHIBIT
FORTUNA WAY DRIVEWAYS

PROJECT NO. 2020086.00

LEGEND

INGRESS

EGRESS



GRAPHIC SCALE

1 inch = 40 ft.

DATE: 08/02/2021

DRAWN BY: AK

CHECKED BY: VG

NV5

1255 CANTON ST, SUITE G
ROSWELL, GA 30075
(678) 795-3600
WWW.NV5.COM

REVISION DATES		

TRUCK TURNING EXHIBIT SINGLETON DR CONSTRUCTION ENTRANCE

PROJECT NO. 2020086.00

Appendix J – Cost Estimates

CITY OF RIALTO

Riverside Avenue/Slover Avenue

Preliminary Opinion on Probable Project Cost

PSOMAS

Preparer(s): Karen Nguyen

Reviewer: Arief Naftali

Date Updated: 11/18/16

DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	EXTENDED AMOUNT	ASSUMPTIONS
Miscellaneous					
Mobilization/Demobilization (Not to Exceed 5% of Subtotal)	1	LS	$ 20,000.00	$ 20,000	
Construction Survey	1	LS	$ 10,000.00	$ 10,000	
Construction Management & Inspection	1	LS	$ 40,000.00	$ 40,000	Performed by Psomas
Construction Administration	1	LS	$ 20,000.00	$ 20,000	Performed by Psomas
Stormwater Control/BMPs/SWPPP	1	LS	$ 5,000.00	$ 5,000	
Clearing and Grubbing	1	LS	$ 3,500.00	$ 3,500	Per Greenbook
Traffic Control (Including Construction Signs and CMS)	1	LS	$ 15,000.00	$ 15,000	
			Miscellaneous Subtotal	**$ 113,500**	
Intersection					
Construct Type 8 Integral Curb and Gutter	190	LF	$ 19.00	$ 3,610	
Construct 4" PCC Sidewalk	1,900	SF	$ 5.95	$ 11,305	10' Sidewalk
Construct Curb Ramps	4	EA	$ 2,390.00	$ 9,560	
Traffic Signal Relocation Per Pole, 1A (10') Pole	4	EA	$ 6,550.00	$ 26,200	
Traffic Signal Relocation Per Pole, Pole With Mastarm	4	EA	$ 13,100.00	$ 52,400	
Relocate PB or Adj. Grade	8	EA	$ 120.00	$ 960	
Traffic Signal Loops	32	EA	$ 450.00	$ 14,400	
			Intersection Construction Subtotal =	**$ 118,435**	
Utility Improvements					
Construct Catch Basin - 7'	1	EA	$ 6,240.00	$ 6,240	
Construct Catch Basin - 14'	1	EA	$ 11,350.00	$ 11,350	
Construct Junction Structure	0	EA	$ 2,837.00	$ -	
Construct Local Depression	0	EA	$ 1,192.00	$ -	
Adjust Sewer Manhole to Grade	2	EA	$ 800.00	$ 1,600	
Adjust Unknown Manhole to Grade	2	EA	$ 800.00	$ 1,600	
Adjust Water Valve to Grade	3	EA	$ 500.00	$ 1,500	
Relocate Power Pole	1	EA		$ -	SCE will handle relocation cost
Relocate Street Light	0	EA	$ 6,810.00	$ -	
Relocate Fire Hydrant	1	EA	$ 3,000.00	$ 3,000	
Relocate Vent	0	EA	$ 10,000.00	$ -	
Relocate Vault	0	EA	$ 5,000.00	$ -	
Relocate Cabinent	0	EA	$ 5,000.00	$ -	
			Utility Improvements Subtotal =	**$ 25,290**	
Landscaping and Irrigation Improvements					
Median Landscaping	0	LS	$ -	$ -	
Median Irrigation	0	LS	$ -	$ -	
Water and Electrical POC's	0	LS	$ -	$ -	
Tree Removal	0	EA	$ -	$ -	
			Landscaping and Irrigation Improvements Subtotal =	**$ -**	
Signing and Striping Improvement					
Signing and Striping	1	LS	$ 310.00	$ 310	
			Subtotal =	$ 257,535	
			Contingency (15%) =	$ 38,600	
			CONSTRUCTION TOTAL =	**$296,000**	
			DESIGN TOTAL (20% of Construction Costs) =	**$59,200**	
			GRAND TOTAL	**$355,200**	

CITY OF RIALTO

Riverside between I-10 and Agua Mansa (2 mi)

Preliminary Opinion on Probable Project Cost

PSOMAS

Preparer(s): Lisette Bice

Reviewer: Arief Naftali

Date Updated: 08/09/16

DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	EXTENDED AMOUNT	ASSUMPTIONS
Miscellaneous					
Mobilization/Demobilization (Not to Exceed 5% of Subtotal)	1	LS	$ 800,000.00	$800,000	
Construction Survey	1	LS	$ 150,000.00	$150,000	
Construction Management & Inspection	1	LS	$ 3,000,000.00	$3,000,000	Performed by Psomas
Stormwater Control/BMPs/SWPPP	1	LS	$ 7,000.00	$7,000	
Clearing and Grubbing	1	LS	$ 500,000.00	$500,000	Per Greenbook
Traffic Control (Including Construction Signs and CMS)	1	LS	$ 90,000.00	$90,000	
Right-of-Way Acquisition	140,643	SF	$ 15.00	$2,109,645	
			Miscellaneous Subtotal =	**$6,700,845**	
Road Construction					
Construct Type 8 Integral Curb and Gutter	22,000	LF	$ 19.00	$ 418,000	
Construct 4" PCC Sidewalk	253,440	SF	$ 5.95	$ 1,507,968	
Construct 8" Median Curb	21,500	LF	$ 15.00	$ 322,500	
Construct PCC Paving in Medians	16,000	SF	$ 5.95	$ 95,200	Assume 18" band
Construct Curb Ramps	21	EA	$ 2,390.00	$ 50,190	
Subgrade Preparation	225,500	SF	$ 0.36	$ 81,180	Top 6" of Soil
1-1/2" Cold Mill ($35,000 + $0.80/SF)	789,000	SF	$ 0.80	$ 631,200	
Construct 1-1/2" Overlay Asphalt Pavement	789,000	SF	$ 0.90	$ 710,100	
Construct 5" Asphalt Pavement/Aggregate Base (5"/6")	225,500	SF	$ 4.00	$ 902,000	Full Depth
Construct Commercial Driveway	17,000	SF	$ 10.75	$ 182,750	
Construct Residential Driveway	0	SF	$ 10.75	$ -	
Construct Cross Gutter	1	EA	$ 5,000.00	$ 5,000	
Construct Parkway Culvert	3	EA	$ 1,500.00	$ 4,500	
construct Retaining Wall	575	LF	$ 100.00	$ 57,500	
Wide Overpass	15,000	SF	$ 1,000.00	$ 15,000,000	
			Road Construction Subtotal =	**$ 19,968,088**	
Utility Improvements					
Adjust Sewer Manhole to Grade	0	EA	$ 800.00	$0	
Adjust Unknown Manhole to Grade	0	EA	$ 800.00	$0	
Adjust Vault to Grade	0	EA	$ 3,000.00	$0	
Adjust Water Valve to Grade	3	EA	$ 500.00	$1,500	
Relocate Manhole	0	EA	$ 5,000.00	$0	
Relocate Power Pole	52	EA	$ -	$0	SCE will cover the cost of the relocation
Relocate Guy Wire	19	EA	$ 15,000.00	$285,000	
Relocate Water Meter	19	EA	$ 500.00	$9,500	
Relocate Street Light	21	EA	$ 6,810.00	$143,010	
Relocate Fire Hydrant	32	EA	$ 3,000.00	$96,000	
Relocate Vent	0	EA	$ 10,000.00	$0	
Relocate Vault	0	EA	$ 5,000.00	$0	
Relocate Cabinent	0	EA	$ 5,000.00	$0	
Relocate Mailbox	3	EA	$ 300.00	$900	
Relocate Pull Box	21	EA	$ 700.00	$14,700	
Construct Catch Basin - 7'	0	EA	$ 6,240.00	$0	
Construct Catch Basin - 14'	11	EA	$ 11,350.00	$124,850	
Construct Local Depression	11	EA	$ 1,192.00	$13,112	
Construct Concrete Collar	11	EA	$ 2,980.00	$32,780	
Construct 18" RCP	165	LF	$ 113.50	$18,728	
			Utility Subtotal =	**$740,080**	
Rail Improvements					
Relocate Rail Signals	0	EA	$ 250,000.00	$ -	
Relocate Rail Bungalow	0	EA	$ 50,000.00	$ -	
			Rail Subtotal =	**$0**	
Landscaping and Irrigation Improvements					
Median Landscaping	10,560	LF	$ 100.00	$ 1,056,000	No Street Trees or Parkway Landscaping
Median Irrigation	10,560	LF	$ 75.00	$ 792,000	Mainline, conduit, POV
			Landscaping Subtotal =	**$1,848,000**	
Signing and Striping Improvement					
Signing and Striping	1	LS	$ 40,000.00	$ 40,000	
			Signing and Striping Subtotal =	**$40,000**	
			Subtotal =	$29,297,013	
			Contingency (15%) =	$4,394,600	
			CONSTRUCTION TOTAL =	**$33,691,600**	
			DESIGN TOTAL (20% of Construction Costs) =	**$6,738,320**	
			GRAND TOTAL =	**$40,429,920**	

MEMORANDUM

Date: September 6, 2021

Ref: Vehicle Miles Traveled (VMT) Study
Angelus Block Co. Manufacturing Plant (MC2020-0012)
Fortuna Avenue
Rialto, CA 92010

This memo summarizes the findings and recommendations of the Vehicle Miles Traveled (VMT) analysis for the proposed Angelus Block manufacturing facility in the City of Rialto, CA. The VMT analysis results are presented below.

Background

With the adoption of Senate Bill (SB) 743, the State of California changed the method of traffic analysis required through the California Environmental Quality Act (CEQA) for publicly and privately initiated projects. The law changed the way local jurisdictions, like the County of San Bernadino, analyze transportation impacts from development projects and identify mitigation measures to reduce those impacts. SB 743 became effective on July 1, 2020. The County of San Bernadino uses VMT as the new analysis metric.

Project Description

The project is a proposed manufacturing plant consisting of 188,493 square feet. Access to the site is provided via a cul-de-sac at the end of Fortuna Way. There are two one-way driveways spaced out within this cul-de-sac: one for entering and one for exiting. A secondary entrance is located at the end of Singleton Drive at the southern portion of the proposed site. This entrance is dedicated to construction vehicles and will not be used for daily operations once construction of the site is complete.

General Plan Consistency

The site is located within the Agua Mansa Specific Plan and is consistent with the City's General Plan. The industrial corridor is 4,285 acres, located south of I-10 and west of I-215 on the western bank of the Santa Ana River. The corridor is approved for a variety of land uses, including industrial, agricultural, and residential.

According to the City of Rialto's General Plan (2010), Policy 2-9.3: Focus the establishment of new industries using, manufacturing, transporting, or storing hazardous or toxic materials or wastes within the Agua Mansa Industrial Corridor Area. For the corridor the General Plan the objectives for the Agua Mansa Project Area include maintaining and enhancing opportunities for industrial activity, employment creation, and infrastructure improvements.

County VMT Guidelines

The City of Rialto's VMT Analysis Guidelines are currently in development, therefore, the County of San Bernadino's Transportation Impact Study Guidelines (2019) were used. The guidelines require a VMT analysis be conducted if a project generates over 110 trips per day. Trips generated by the project's proposed land uses have been estimated based on trip generation rates collected by the Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition. The resulting trip generation for the proposed project is presented in the traffic impact study (TIS) dated September 2021. According to the 2021 TIS, the project is anticipated to generate 1,270 passenger car equivalent daily trips per day. Based on the County's 110 daily trip threshold, the project is required to evaluate VMT per employee to determine the project's impact to VMT.

VMT Screening Evaluation

The County guidelines permit the use of the San Bernardino Transportation Analysis Model (SBTAM) most recent interactive VMT map[1] to estimate VMT for the traffic analysis zone (TAZ) in which the proposed project is located. Industrial projects are evaluated based on VMT/employee and are considered to have significant impacts when the VMT/employee for the project exceeds the regional average VMT/employee. Table 1 includes the regional mean VMT per employee and the VMT per Employee for the project's TAZ in which the proposed manufacturing facility would be located. Images of the interactive map results are attached for reference.

Table 1. VMT Comparison

VMT/Employee	
County of San Bernadino VMT	27.2
Project TAZ VMT	107.8

Based on the screening map, employee based VMT for the project is higher than the regional average. To determine the project's significance, a model run was required and performed using the most recent version of the SBTAM.

VMT Model Results

The San Bernardino Transportation Analysis Model (SBTAM) baseline model year output files were used to calculate the VMT metrics for the Project TAZ and the San Bernardino County region. The VMT calculation methodology outlined below has been developed based on VMT calculation methodologies utilized by other jurisdictions in Riverside County and the surrounding region.

As part of the impact analysis under CEQA, both project impacts and cumulative impacts must be evaluated to determine the project's impact on the environment. Therefore, VMT analyses were conducted for the project buildout year (2022) and for the SBTAM horizon model year (2040) to determine buildout year and cumulative impacts. The VMT were analyzed for the following traffic conditions:

- Baseline (2022) Without Project;
- Baseline (2022) With Project;
- Cumulative (2040) Without Project; and
- Cumulative (2040) With Project conditions.

VMT results for each condition are identified in Table 2.

Table 2. VMT Model Results

VMT/Employee	Baseline 2022 Conditions		Change	Cumulative 2040 Conditions		Change
	Without Project	With Project		Without Project	With Project	
County of San Bernadino	18.98	21.18	2.20	24.69	20.71	-3.98
Project TAZ	23.04	24.17	1.13	26.91	22.04	-4.87

[1] https://sbcta.maps.arcgis.com/apps/webappviewer/index.html?id=779a71bc659041ad995cd48d9ef4052b last consulted 06/13/2021.

Using the County of San Bernadino for comparison, the project is anticipated to have a significant impact on VMT under Baseline 2022 Conditions as identified in Table 2. In the Cumulative 2040 Condition, the project will not have a significant impact on VMT and will reduce the Cumulative VMT by 3.98. Specific model information and input criteria is provided in the Attachments.

VMT Reduction Strategies

According to the County of San Bernadino's Traffic Study Guidelines (2019), a project that has a higher VMT per person/employee than the regional average should be mitigated to 4% below the baseline VMT. The project therefore is required to reduce the project VMT to 4% below the Baseline 2022 Condition for a resulting VMT of 18.22. No mitigation is required for the 2040 Cumulative Condition.

Based on the County guidelines, projects that are over the VMT threshold should consist of Transportation Demand Management (TDM) measures analyzed under a VMT-reduction methodology consistent with Chapter 7 of the California Air Pollution Control Officers Association (CAPCOA) Quantifying Greenhouse Gas Mitigation Measures (August 2010). The following TDM measures will be implemented with the project and are feasible based on the project site land use and operation.

- **Commute Trip Reduction**
    - Applying TRT-1 from CAPCOA: Implement Commute Trip Reduction Marketing
      This includes existing and new employee orientation of trip reduction and alternative mode options and disbursement of alternative mode choice marketing materials and resources (100% of employees eligible). Additionally, the project will provide a Transportation Coordinator to distribute TDM information to existing employees and new hires, and provide priority parking for vanpool/carpool participants.
- **Ride Share Program**
  Participation in the County of San Bernadino's Carpool and Vanpool Ride-Matching Services and encouragement for employees to participate in the program.

- **Preferential Parking Permit Program**
  The project will provide preferential parking spaces to carpool and vanpool participants, this measure compliments TRT-1 and TRT-3 therefore no reduction was applied to avoid double counting.

Additional VMT reduction strategies the project is committed to include a 25% **Local Hiring Commitment.** The Local Hiring Commitment guarantees at least 25% of employees will be located within the City of Rialto and adjacent cities, creating more internalized trips, and supporting the goals of SB 743. Based on sociodemographic data within the City's boundaries, the average distance of travel to the site is 11.93 miles. The local hiring commitment would include any jurisdiction within that limit. Based on the average VMT per employee, creating employment opportunities in the City is an effective VMT reducing measure bringing the average VMT to 18.87 miles with a 25% local hiring commitment. The VMT per employee therefore would be below the Baseline 2022 without Project condition. Employment data is provided in the Attachments.

Using the methodology provided by CAPCOA and the local hiring commitment, the VMT reduction for the project is identified in Table 3.

	Reduction Strategy	Range of Effectiveness	VMT Reduction	Combined VMT Reduction	Results
Commute Trip Reduction (CAPCOA)					
TRT-1	Implement Commute Trip Reduction Marketing	0.8 - 6.2%	4.16%	8.8%	-1.86
TRT-3	Provide Ride Sharing Program	1-15%	5.0%	8.8%	
TRT-8	Preferential Parking Permit Program	N/A	N/A	8.8%	
Baseline 2022 Conditions w/ Project					21.18
Baseline 2022 Conditions w/ Project (CAPCOA Reduction)					19.32
Local Hiring Reduction (25%)					2.32
Baseline 2022 Conditions w/ Project (Local Hiring and CAPCOA Strategies)					17.0

Notes:

1. VMT Reduction results based on methodology from Quantifying Greenhouse Gas Mitigation Measures (CAPCOA, 2010).
2. TRT-series measures apply to commute VMT, which is estimated at 100 percent of the overall Project Employee VMT.
3. TRT-1 includes TDM coordinator, carpool encouragement, vanpool assistance, and ride matching assistance. Alternative literature was referenced for applicability purposes.TRT-8 strategy is a complement to TRT-1.
4. TRT-3 Ride share program 100% of employees are eligible for the rideshare program participation.
5. The project's total VMT Reduction based on CAPCOA is 8.8% (1.86).
   Each VMT reduction measure's percent reduction is combined multiplicatively to get the project's total VMT Reduction. As discussed in Chapter 6 of the CAPCOA report, the equation is as follows: Combined CAPCOATotal Reduction = 1 - [(1-A) x (1-B) x (1-C) x ...]; A,B,C, = each measure's percent reduction
6. Local hiring commitment assumes at least 25% of employees will be local hires. With 25% local hires the new VMT average is 18.87. See attachments for eligible employees and distance traveled to the project site.

Results

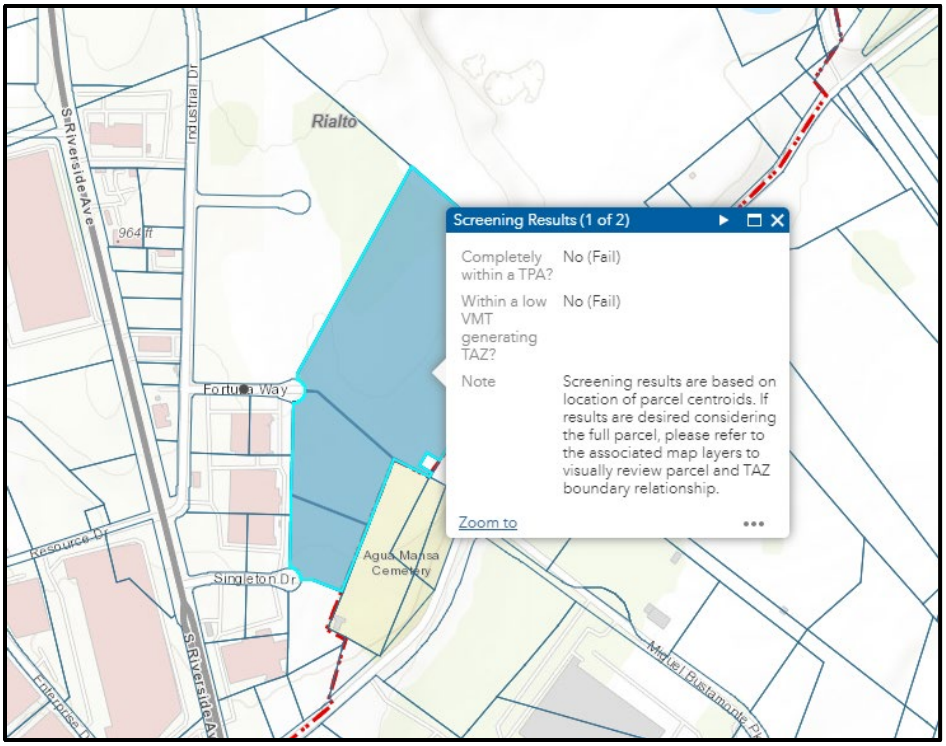
With CAPCOA strategies and the Local Hiring Commitment, the project is anticipated to reduce VMT at least 4% below the baseline VMT. With the implementation of the strategies identified in this memorandum, the project will result in a total VMT per employee of 17.0 in the Baseline 2022 Condition. The project does not result in a significant impact and reduces VMT in the Cumulative 2040 Condition. No additional VMT reduction strategies are required.

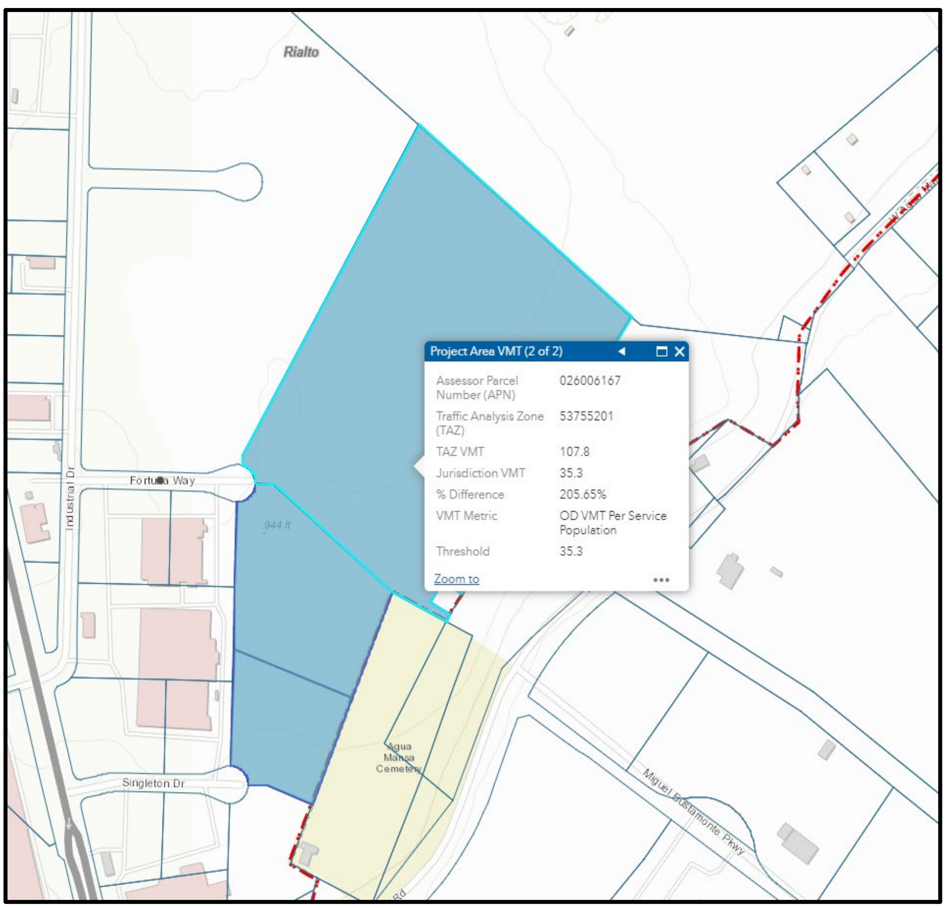
Attachments

VMT Screening Map Results
Model Run Methodology
Model Run Results
City Employee VMT Results

Attachments

VMT Screening Map Results





300 Corporate Pointe, Suite 470, Culver City, CA 90230
T: (310) 473-6508 | www.koacorp.com
MONTEREY PARK ORANGE ONTARIO SAN DIEGO LA QUINTA CULVER CITY

VMT CALCULATION METHODOLOGY

The San Bernardino Transportation Analysis Model (SBTAM) baseline model year output files were used to calculate the VMT metrics for the Project TAZ, the City of Rialto, and the San Bernardino County region. The VMT calculation methodology outlined below has been developed based on VMT calculation methodologies utilized by other jurisdictions in Riverside County and the surrounding region.

As part of the impact analysis under CEQA, both Project impacts and cumulative impacts must be evaluated to determine the Project's impact on the environment. Therefore, VMT analyses were conducted for the Project buildout year (2022) to evaluate Project impacts and for the SBTAM horizon model year (2040) to determine cumulative impacts. The VMT were analyzed for the following traffic conditions:

- Baseline (2022) Without Project conditions;
- Baseline (2022) With Project conditions;
- Cumulative (2040) Without Project conditions; and
- Cumulative (2040) With Project conditions.

As the Project buildout year does not coincide with the SBTAM base year (2016) or future year (2040), VMT results were interpolated between these two conditions to estimate VMT results during the Project's buildout year (2022).

The model output files for the SBTAM without adjustments to the model assumptions were used to determine the VMT metrics for the Without Project scenario. VMT results for the With Project conditions were determined by running the SBTAM with adjusted socioeconomic data (SED) inputs to account for the land use changes resulting from Project development. These changes in SED reflected Project-related employment increases for the Project TAZ under With Project conditions. The adjustments to the SED assumptions are detailed in the following section.

Once the adjustments were made to the SED, the SBTAM was run for the base year (2016) and future year (2040), each for the With Project conditions. The output files from these model runs were assessed to determine the VMT metrics for the Project TAZ, the City of Rialto overall, and the entire San Bernardino County region. The home-based work VMT was calculated using the production-attraction (PA) methodology, which allows for the calculation of VMT for specific trip types. This methodology consists of converting the peak (PK) and off-peak (OP) PA matrices from person trips to vehicles trips using average vehicle occupancy rates. This process replicated the model process of converting PA matrices to origin-destination (OD) matrices, however it was conducted only for the home-based work trip type while keeping departure and return trips distinct. The PK and OP skim matrices were then multiplied by the custom-calculated home-based work vehicle trip matrices to estimate VMT. The VMT matrices were then summed to combine PK and OP VMT estimates for departure and return trips. The total daily home-based work VMT was then extracted using the marginal totals from the daily departure and return VMT matrices (column of departure matrix and row of return matrix) for the individual Project TAZ, the City of Rialto TAZs, and the San Bernardino County TAZs. These totals were then divided by the total employment of the Project TAZ, the Rialto TAZs, and the San Bernardino County TAZs, respectively, to determine the home-based work VMT per employee for the corresponding geographical region.

SBTAM SOCIOECONOMIC DATA ASSUMPTIONS

VMT results for the With Project conditions were determined by running the SBTAM with appropriate SED inputs to account for the land use changes resulting from Project development. In order to ensure that the SBTAM accounts for proposed levels of development on the Project site, the SED input data for the model base (2016) and future (2040) years were reviewed. Adjustments were made to the SED assumptions for both model years under to account for employment growth under With Project conditions.

SBTAM BASE YEAR (2012) SOCIOECONOMIC DATA ADJUSTMENTS

For the With Project scenario, Project-related employment increases were added to the SED assumptions from the base year (2012) Without Project conditions. Since the Project consists of the development of a paving stone/brick manufacturing facility, the additional employees were categorized within the manufacturing employment type.

SBTAM FUTURE YEAR (2040) SOCIOECONOMIC DATA ADJUSTMENTS

The SED assumptions for the SBTAM future year (2040) were also adjusted to account for employment growth assumptions for the Project TAZ. For the future year (2040) Plus Project conditions, the Project-added employment estimates were then added to the SED assumptions for the future year (2040) Without Project conditions. All additional employment added to the Project TAZ was categorized by manufacturing employment type. Additionally, employment estimates added to the Project TAZ were also proportionately removed from surrounding non-Project TAZs to maintain a constant level of regional growth for the SBTAM future year. Maintaining a constant level of employment growth in the region ensures consistency with the Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS). Therefore, SED assumptions for TAZs within an approximately 5-mile radius of the Project site was reviewed to identify the TAZs with the most manufacturing jobs.

Model Run Results

Angeles Block Company
VMT Analysis
Project TAZ Socioeconomic Data Adjustments

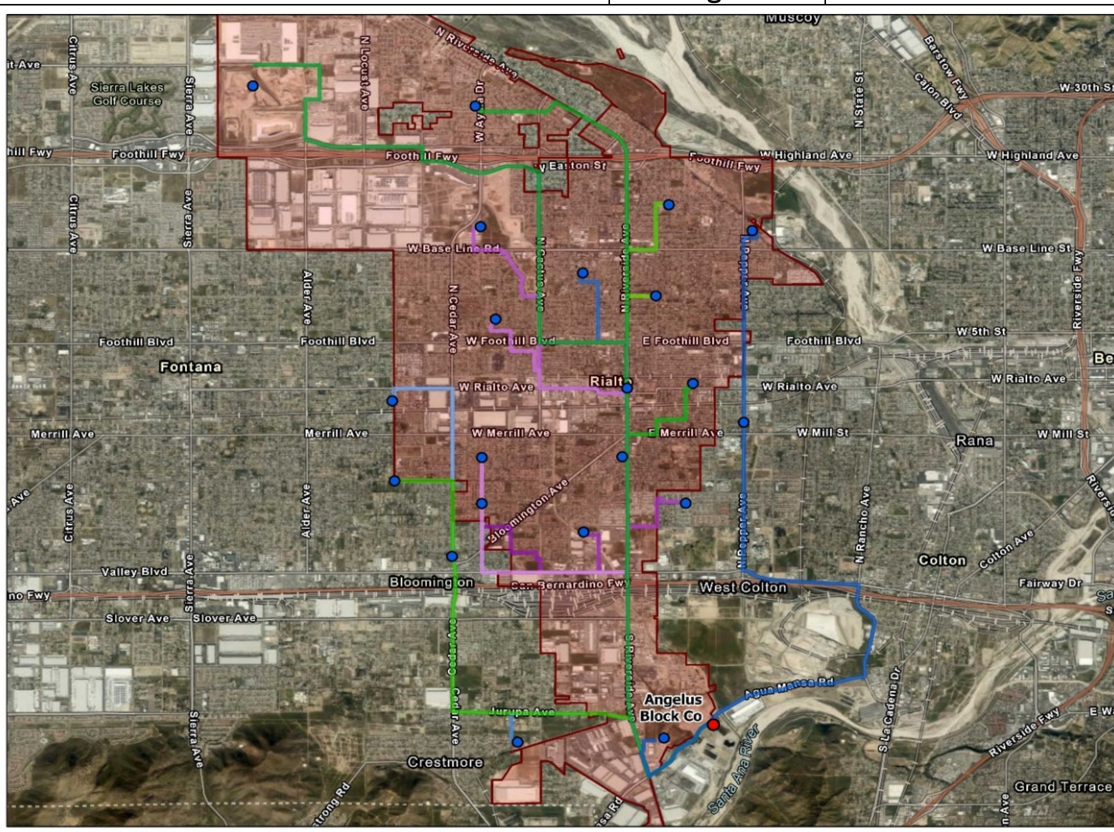
Project TAZ (ID: 53755201)	Total Employees	Wage Level			Employment Industry
		Low Income	Medium Income	High Income	Manufacturing
Baseline (2016) SED Data Assumptions	512	244.3	123.5	144.1	126.6
Adjusted Baseline (2016) SED Data Assumptions	587	254.3	173.5	159.1	201.6
Cumulative (2040) SED Data Assumptions	1028	622.8	217.7	187.5	89.4
Adjusted Cumulative (2040) SED Data Assumptions	1103	632.8	267.7	202.5	164.4

Angelus Block Company
VMT Analaysis
Future Model Year Socioeconomic Data Adjustments

	Cumulative (2040) SED Data Assumptions					Adjusted Cumulative (2040) SED Data Assumptions - With Project Condition				
	Total	Wage Level			Employment Industry	Total	Wage Level			Employment Industry
TAZ ID	Employees	Low Income	Medium Income	High Income	Manufacturing	Employees	Low Income	Medium Income	High Income	Manufacturing
53775301	1127	560.2	466.8	100.0	728.0	1116	558.2	460.8	97.0	717.0
43240200	2751	1592.0	711.0	448.0	392.0	2745	1591.0	707.0	447.0	386.0
43144300	3333	1506.0	883.0	944.0	355.0	3327	1505.0	879.0	943.0	349.0
43246100	1633	939.0	377.0	317.0	161.0	1630	939.0	376.0	315.0	158.0
53753201	1939	1135.9	497.6	305.5	158.2	1936	1135.9	496.6	303.5	155.2
53774102	1134	746.3	268.2	119.5	154.3	1131	746.3	267.2	117.5	151.3
43249200	1314	773.0	296.0	245.0	118.0	1312	773.0	295.0	244.0	116.0
53775302	173	86.0	71.7	15.4	110.6	171	86.0	70.7	14.4	108.6
43144400	915	601.0	180.0	134.0	101.0	913	601.0	179.0	133.0	99.0
53760101	3350	2277.0	654.7	418.3	100.3	3348	2277.0	653.7	417.3	98.3
43249300	998	571.0	231.0	196.0	100.0	996	570.0	230.0	196.0	98.0
43251100	779	467.0	159.0	153.0	97.0	777	466.0	158.0	153.0	95.0
53749301	1263	753.3	315.2	194.5	96.5	1261	752.3	314.2	194.5	94.5
53789301	358	209.7	90.2	58.1	95.0	356	208.7	89.2	58.1	93.0
43240100	518	281.0	146.0	91.0	93.0	516	280.0	145.0	91.0	91.0
53789302	298	174.5	75.1	48.4	90.4	296	173.5	74.1	48.4	88.4
43258100	567	366.0	128.0	73.0	74.0	566	366.0	127.0	73.0	73.0
43238100	2525	1749.0	461.0	315.0	73.0	2524	1749.0	460.0	315.0	72.0
53753401	667	364.1	150.4	152.5	70.7	666	364.1	149.4	152.5	69.7
53757401	3394	2344.9	672.6	376.4	70.4	3393	2344.9	671.6	376.4	69.4
53773201	648	396.8	163.6	87.6	65.7	647	396.8	162.6	87.6	64.7
53760301	575	355.3	119.5	100.1	49.4	574	355.3	118.5	100.1	48.4
53749302	603	359.6	150.5	92.9	45.2	602	359.6	149.5	92.9	44.2
53774501	585	348.2	149.9	86.8	44.9	584	348.2	148.9	86.8	43.9
53757302	1652	1151.1	285.0	216.0	44.3	1651	1151.1	284.0	216.0	43.3
53748101	819	559.2	211.8	48.0	40.4	818	559.2	210.8	48.0	39.4
43249100	1351	935.0	247.0	169.0	39.0	1350	935.0	246.0	169.0	38.0
53759302	97	88.5	7.5	0.9	36.0	96	88.5	6.5	0.9	35.0
43144200	1226	849.0	224.0	153.0	35.0	1225	849.0	223.0	153.0	34.0
53770202	1811	1230.9	352.6	227.5	31.6	1810	1230.9	351.6	227.5	30.6
53748801	784	517.5	129.6	136.8	29.1	783	517.5	128.6	136.8	28.1
53744201	766	491.5	163.4	111.1	29.1	765	491.5	162.4	111.1	28.1
53757501	1377	936.8	268.4	171.8	28.7	1376	936.8	267.4	171.8	27.7
43244200	970	671.0	178.0	121.0	28.0	969	671.0	177.0	121.0	27.0
53754301	858	583.6	167.0	107.4	26.3	857	583.6	166.0	107.4	25.3
53773101	267	165.7	65.8	35.5	25.3	266	165.7	64.8	35.5	24.3
53752101	1496	909.5	361.4	225.0	25.2	1495	909.5	360.4	225.0	24.2
53774301	326	220.1	68.4	37.5	25.1	325	220.1	67.4	37.5	24.1
53748701	482	357.9	77.0	47.1	25.0	481	357.9	76.0	47.1	24.0
53755201	1028	622.8	217.7	187.5	89.4	1103	632.8	267.7	202.5	164.4
Total	46757	29247	10443	7067	4001	46757	29247	10443	7067	4001

City Employee VMT Results

Residence Location	Workplace Location	Number of Workers Eligible	Vehicle Miles Traveled (Total)
C3100US06071004004	C3100US06071004004	215	2.67
C1100US06071004401	C3100US06071004004	25	10.34
C1100US06071003605	C3100US06071004004	4	10.10
C1100US06071003609	C3100US06071004004	10	7.72
C1100US06071003611	C3100US06071004004	15	8.79
C1100US06071003503	C3100US06071004004	10	16.16
C1100US06071003507	C3100US06071004004	25	13.92
C1100US06071003603	C3100US06071004004	4	11.12
C1100US06071003405	C3100US06071004004	15	14.36
C1100US06071003606	C3100US06071004004	4	9.42
C1100US06071004003	C3100US06071004004	15	5.66
C1100US06071003607	C3100US06071004004	20	8.73
C1100US06071003505	C3100US06071004004	4	13.44
C1100US06071003804	C3100US06071004004	30	14.81
C1100US06071003803	C3100US06071004004	15	12.63
C1100US06071003801	C3100US06071004004	30	14.87
C1100US06071003403	C3100US06071004004	40	12.07
C1100US06071003700	C3100US06071004004	10	10.13
C1100US06071003900	C3100US06071004004	20	11.32
C1100US06071002705	C3100US06071004004	20	18.58
C1100US06071002704	C3100US06071004004	90	23.83
		Average VMT	**11.94**



Delivering Solutions
Improving Lives

DEPARTMENT OF THE INTERIOR
U.S. FISH AND WILDLIFE SERVICE

3-201
(1/97)

FEDERAL FISH AND WILDLIFE PERMIT

1. PERMITTEE

ANTONINI TRUST
11374 TUXFORD STREET
SUN VALLEY, LOS ANGELES COUNTY, CA 91352

2. AUTHORITY-STATUTES
16 USC 1539(A)

REGULATIONS *(Attached)*
50 CFR 17.22
50 CFR 13

3. NUMBER
TE015986-0

4. RENEWABLE
[X] YES
[ ] NO

5. MAY COPY
[X] YES
[ ] NO

6. EFFECTIVE
8/27/99

7. EXPIRES
8/27/2029

8. NAME AND TITLE OF PRINCIPAL OFFICER *(If #1 is a business)*
MARIO E. ANTONINI
TRUSTEE

9. TYPE OF PERMIT
ENDANGERED SPECIES

10. LOCATION WHERE AUTHORIZED ACTIVITY MAY BE CONDUCTED
City of Rialto, County of San Bernardino, California, on lands described in the Habitt Conservation Plan prepared for the Edward Antonini Residuary Trust, Angelus Block company, Inc., and E-Z Mix, Inc.

11. CONDITIONS AND AUTHORIZATIONS:

A. GENERAL CONDITIONS SET OUT IN SUBPART D OF 50 CFR 13, AND SPECIFIC CONDITIONS CONTAINED IN FEDERAL REGULATIONS CITED IN BLOCK #2 ABOVE, ARE HEREBY MADE A PART OF THIS PERMIT. ALL ACTIVITIES AUTHORIZED HEREIN MUST BE CARRIED OUT IN ACCORD WITH AND FOR THE PURPOSES DESCRIBED IN THE APPLICATION SUBMITTED. CONTINUED VALIDITY, OR RENEWAL, OF THIS PERMIT IS SUBJECT TO COMPLETE AND TIMELY COMPLIANCE WITH ALL APPLICABLE CONDITIONS, INCLUDING THE FILING OF ALL REQUIRED INFORMATION AND REPORTS.

B. THE VALIDITY OF THIS PERMIT IS ALSO CONDITIONED UPON STRICT OBSERVANCE OF ALL APPLICABLE FOREIGN, STATE, LOCAL OR OTHER FEDERAL LAW.

C. VALID FOR USE BY PERMITTEE NAMED ABOVE.

D. Further conditions of authorization are contained in the attached Special Terms and Conditions.

[X] ADDITIONAL CONDITIONS AND AUTHORIZATIONS ALSO APPLY

12. REPORTING REQUIREMENTS

ISSUED BY	TITLE	DATE
Elizabeth H. Stevens	Elizabeth H. Stevens DEPUTY MANAGER, CA/NV OPERATIONS OFFICE	8/27/99

E. All sections of Title 50 *Code of Federal Regulations*, §§ 13, 17.22, and 17.32 are conditions of this permit (Attachment 1).

F. The authorization granted by this permit is subject to compliance with, and implementation of, the final Habitat Conservation Plan (HCP), and the executed Implementation Agreement (IA), for Angelus Block Company, Inc., E-Z Mix, Inc., and the Edward Antonini Residuary Trust, in connection with development of approximately 65 acres in the City of Rialto, San Bernardino County, California. The HCP and IA are hereby incorporated into the permit.

G. Except as conditioned below, the permittees and their designated agents are authorized under the Federal Endangered Species Act of 1973, as amended (Act), to incidentally take (harass; or harm through habitat loss, including injury or kill) the Delhi Sands flower-loving fly (*Rhaphiomidas terminatus abdominalis*), listed as endangered under the Act, to the extent that take of this species would otherwise be prohibited under section 9 of the Act and its implementing regulations, or pursuant to a rule promulgated under section 4(d) of the Act. Take must be incidental to the construction and operation of the Industrial Project on the 65-acre Development Area, and management of the approximately 30.5 acre Conservation Area, as described in the HCP, and as conditioned herein. Pesticide and herbicide use is not covered by this permit.

Conditions

(i) This permit is not effective until authorized individuals from Angelus Block Company, Inc., E-Z Mix, Inc., and the Edward Antonini Residuary Trust have signed the IA.

(ii) Prior to any ground disturbance on lots 1-3, Antonini Trust shall provide evidence to the Service of recordation of deed restrictions for the Conservation Area.

(iii) Prior to any ground disturbance on lot 1-3, Antonini Trust shall provide the Service with proof of the purchase of the United States Treasury Bond. Antonini Trust shall transfer the Endowment to a Conservation Organization, pursuant to the terms of the IA. Permittees agree that the Endowment may need to be replaced by an alternative funding mechanism, the cost of which shall not exceed $195,251, if necessary to select an acceptable Conservation Organization.

(iv) The Conservation Bank Credits will be available for purchase after the permittees have completed the initial trash and weed removal throughout the Conservation Area (required within 6 months of permit issuance), where appropriate, in coordination with the Service.

(v) Prior to the commencement of construction activities, the Applicants shall notify the Service that fencing and signing, and the education program have been successfully implemented.

H. Upon finding dead, injured, or sick endangered or threatened wildlife species, the permittees or their designated agents must notify orally within 1 working day the Service's Carlsbad Fish and Wildlife Office, 2730 Loker Avenue West, Carlsbad, California 92008, telephone (760) 431-9440. Written notification to the Carlsbad Fish and Wildlife Office must be made within 3 working days and must include the date, time, and location of the specimen and any other pertinent information. Dead animals may be marked in an appropriate manner, photographed, and left on site. Should any sick or injured animals survive, the Service should be contacted regarding final disposition of the animals. In the event that a species has been taken in contravention of any Federal, State, or local law, all relevant information shall be reported within 24 hours to the Carlsbad Fish and Wildlife Office or to the Service's Division of Law Enforcement in San Diego, (619) 557-5063.

I. Annual reports shall be prepared as described in the HCP, due by December 31 of each year, beginning in 2000 and continuing until at least 2004. At the end of the 5th year, the conservation organization shall submit a status report to the Service. If the performance criteria have not been met as established in the enhancement/restoration plan prepared by the land manager for the Conservation Area and approved by the Service's Carlsbad Fish and Wildlife Office, maintenance or re-seeding shall be prescribed and monitoring will be extended until performance criteria are met. Upon completion of the 5-year maintenance and monitoring period, the conservation organization shall implement a long-term maintenance program that will include its own reporting schedule.

One copy of the annual report, and any subsequent reporting, shall be submitted to the Field Supervisor of the Carlsbad Fish and Wildlife Office, and one copy shall be submitted to the Assistant Regional Director, Ecological Services, Fish and Wildlife Service, 911 N.E. 11th Avenue, Portland, Oregon 97232.

J. A copy of this permit must be in the possession of the permittees and designated agents while conducting taking activities. Please refer to the permit number in all correspondence concerning permit activities. Any questions you may have about this permit should be directed to the Field Supervisor, Carlsbad Fish and Wildlife Office.

Attachment

[39 FR 1161, Jan. 4, 1974, as amended at 42 FR 10465, Feb. 22, 1977; 42 FR 32377, June 24, 1977; 44 FR 54006, Sept. 17, 1979; 44 FR 59083, Oct. 12, 1979; 45 FR 56673, Aug. 25, 1980; 45 FR 78154, Nov. 25, 1980; 46 FR 42680, Aug. 24, 1981; 48 FR 31607, July 8, 1983; 48 FR 57300, Dec. 29, 1983; 50 FR 39687, Sept. 30, 1985; 50 FR 45408, Oct. 31, 1985; 54 FR 38147, Sept. 14, 1989]

Subpart C—Permit Administration

§ 13.21 Issuance of permits.

(a) No permit may be issued prior to the receipt of a written application therefor, unless a written variation from the requirements, as authorized by § 13.4, is inserted into the official file of the Bureau. An oral or written representation of an employee or agent of the United States Government, or an action of such employee or agent, shall not be construed as a permit unless it meets the requirements of a permit as defined in 50 CFR 10.12.

(b) Upon receipt of a properly executed application for a permit, the Director shall issue the appropriate permit unless:

(1) The applicant has been assessed a civil penalty or convicted of any criminal provision of any statute or regulation relating to the activity for which the application is filed, if such assessment or conviction evidences a lack of responsibility.

(2) The applicant has failed to disclose material information required, or has made false statements as to any material fact, in connection with his application;

(3) The applicant has failed to demonstrate a valid justification for the permit and a showing of responsibility;

(4) The authorization requested potentially threatens a wildlife or plant population, or

(5) The Director finds through further inquiry or investigation, or otherwise, that the applicant is not qualified.

(c) *Disqualifying factors.* Any one of the following will disqualify a person from receiving permits issued under this part.

(1) A conviction, or entry of a plea of guilty or nolo contendere, for a felony violation of the Lacey Act, the Migratory Bird Treaty Act, or the Bald and Golden Eagle Protection Act disqualifies any such person from receiving or exercising the privileges of a permit, unless such disqualification has been expressly waived by the Director in response to a written petition.

(2) The revocation of a permit for reasons found in § 13.28 (a)(1) or (a)(2) disqualifies any such person from receiving or exercising the privileges of a similar permit for a period of five years from the date of the final agency decision on such revocation.

(3) The failure to pay any required fees or assessed costs and penalties, whether or not reduced to judgement disqualifies such person from receiving or exercising the privileges of a permit as long as such moneys are owed to the United States. This requirement shall not apply to any civil penalty presently subject to administrative or judicial appeal; provided that the pendency of a collection action brought by the United States or its assignees shall not constitute an appeal within the meaning of this subsection.

(4) The failure to submit timely, accurate, or valid reports as required may disqualify such person from receiving or exercising the privileges of a permit as long as the deficiency exists.

(d) *Use of supplemental information.* The issuing officer, in making a determination under this subsection, may use any information available that is relevant to the issue. This may include any prior conviction, or entry of a plea of guilty or nolo contendere, or assessment of civil or criminal penalty for a violation of any Federal or State law or regulation governing the permitted activity. It may also include any prior permit revocations or suspensions, or any reports of State or local officials. The issuing officer shall consider all relevant facts or information available, and may make independent inquiry or investigation to verify information or substantiate qualifications asserted by the applicant.

(e) *Conditions of issuance and acceptance.* (1) Any permit automatically incorporates within its terms the conditions and requirements of subpart D of this part and of any part(s) or section(s) specifically authorizing or governing the activity for which the permit is issued.

(2) Any person accepting and holding a permit under this subchapter B acknowledges the necessity for close regulation and monitoring of the permitted activity by the Government. By accepting such permit, the permittee consents to and shall allow entry by agents or employees of the Service upon premises where the permitted activity is conducted at any reasonable hour. Service agents or employees may enter such premises to inspect the location; any books, records, or permits required to be kept by this subchapter B; and any wildlife or plants kept under authority of the permit.

(f) *Term of permit.* Unless otherwise modified, a permit is valid during the period specified on the face of the permit. Such period shall include the effective date and the date of expiration.

(g) *Denial.* The issuing officer may deny a permit to any applicant who fails to meet the issuance criteria set forth in this section or in the part(s) or section(s) specifically governing the activity for which the permit is requested.

[39 FR 1161, Jan. 4, 1974, as amended at 42 FR 32377, June 24, 1977; 47 FR 30785, July 15, 1982; 54 FR 38148, Sept. 14, 1989]

§ 13.22 Renewal of permits.

(a) *Application for renewal.* Applicants for renewal of a permit must submit a written application at least 30 days prior to the expiration date of the permit. Applicants must certify in the form required by § 13.12(a)(5) that all statements and information in the original application remain current and correct, unless previously changed or corrected. If such information is no longer current or correct, the applicant must provide corrected information.

(b) *Renewal criteria.* The Service shall issue a renewal of a permit if the applicant meets the criteria for issuance in § 13.21(b) and is not disqualified under § 13.21(c).

(c) *Continuation of permitted activity.* Any person holding a valid, renewable permit, who has complied with this section, may continue the activities authorized by the expired permit until the Service has acted on such person's application for renewal.

(d) *Denial.* The issuing officer may deny renewal of a permit to any applicant who fails to meet the issuance criteria set forth in § 13.21 of this part, or in the part(s) or section(s) specifically governing the activity for which the renewal is requested.

[54 FR 38148, Sept. 14, 1989]

§ 13.23 Amendment of permits.

(a) *Permittee's request.* Where circumstances have changed so that a permittee desires to have any condition of his permit modified, such permittee must submit a full written justification and supporting information in conformity with this part and the part under which the permit was issued.

(b) *Service reservation.* The Service reserves the right to amend any permit for just cause at any time during its term, upon written finding of necessity.

(c) *Change of name or address.* A permittee is not required to obtain a new permit if there is a change in the legal individual or business name, or in the mailing address of the permittee. A permittee is required to notify the issuing office within 10 calendar days of such change. This provision does not authorize any change in location of the conduct of the permitted activity when approval of the location is a qualifying condition of the permit.

[54 FR 38148, Sept. 14, 1989]

§ 13.24 Right of succession by certain persons.

(a) Certain persons, other than the permittee are granted the right to carry on a permitted activity for the remainder of the term of a current permit provided they comply with the provisions of paragraph (b) of this section. Such persons are the following:

(1) The surviving spouse, child, executor, administrator, or other legal representative of a deceased permittee; and

(2) A receiver or trustee in bankruptcy or a court designated assignee for the benefit of creditors.

(b) In order to secure the right provided in this section the person or persons desiring to continue the activity shall furnish the permit to the issuing officer for endorsement within 90 days

from the date the successor begins to carry on the activity.

[54 FR 38149, Sept. 14, 1989]

§ 13.25 Permits not transferable; agents.

(a) Permits issued under this part are not transferable or assignable. Some permits authorize certain activities in connection with a business or commercial enterprise and in the event of any lease, sale, or transfer of such business entity, the successor must obtain a permit prior to continuing the permitted activity. However, certain limited rights of succession are provided in § 13.24.

(b) Except as otherwise stated on the face of the permit, any person who is under the direct control of the permittee, or who is employed by or under contract to the permittee for purposes authorized by the permit, may carry out the activity authorized by the permit, as an agent for the permittee.

[54 FR 38149, Sept. 14, 1989]

§ 13.26 Discontinuance of permit activity.

When a permittee, or any successor to a permittee as provided for by § 13.24, discontinues activities authorized by a permit, the permittee shall within 30 calendar days of the discontinuance return the permit to the issuing office together with a written statement surrendering the permit for cancellation. The permit shall be deemed void and cancelled upon its receipt by the issuing office. No refund of any fees paid for issuance of the permit or for any other fees or costs associated with a permitted activity shall be made when a permit is surrendered for cancellation for any reason prior to the expiration date stated on the face of the permit.

[54 FR 38149, Sept. 14, 1989]

§ 13.27 Permit suspension.

(a) *Criteria for suspension.* The privileges of exercising some or all of the permit authority may be suspended at any time if the permittee is not in compliance with the conditions of the permit, or with any applicable laws or regulations governing the conduct of the permitted activity. The issuing officer may also suspend all or part of the privileges authorized by a permit if the permittee fails to pay any fees, penalties or costs owed to the Government. Such suspension shall remain in effect until the issuing officer determines that the permittee has corrected the deficiencies.

(b) *Procedure for suspension.* (1) When the issuing officer believes there are valid grounds for suspending a permit the permittee shall be notified in writing of the proposed suspension by certified or registered mail. This notice shall identify the permit to be suspended, the reason(s) for such suspension, the actions necessary to correct the deficiencies, and inform the permittee of the right to object to the proposed suspension. The issuing officer may amend any notice of suspension at any time.

(2) Upon receipt of a notice of proposed suspension the permittee may file a written objection to the proposed action. Such objection must be in writing, must be filed within 45 calendar days of the date of the notice of proposal, must state the reasons why the permittee objects to the proposed suspension, and may include supporting documentation.

(3) A decision on the suspension shall be made within 45 days after the end of the objection period. The issuing officer shall notify the permittee in writing of the Service's decision and the reasons therefore. The issuing officer shall also provide the applicant with the information concerning the right to request reconsideration of the decision under § 13.29 of this part and the procedures for requesting reconsideration.

[54 FR 38149, Sept. 14, 1989]

§ 13.28 Permit revocation.

(a) *Criteria for revocation.* A permit may be revoked for any of the following reasons:

(1) The permittee willfully violates any Federal or State statute or regulation, or any Indian tribal law or regulation, or any law or regulation of any foreign country, which involves a violation of the conditions of the permit or of the laws or regulations governing the permitted activity; or

(2) The permittee fails within 60 days to correct deficiencies that were the cause of a permit suspension; or

(3) The permittee becomes disqualified under § 13.21(c) of this part; or

(4) A change occurs in the statute or regulation authorizing the permit that prohibits the continuation of a permit issued by the Service; or

(5) The population(s) of the wildlife or plant that is subject of the permit declines to the extent that continuation of the permitted activity would be detrimental to maintenance or recovery of the affected population.

(b) *Procedure for revocation.* (1) When the issuing officer believes there are valid grounds for revoking a permit, the permittee shall be notified in writing of the proposed revocation by certified or registered mail. This notice shall identify the permit to be revoked, the reason(s) for such revocation, the proposed disposition of the wildlife, if any, and inform the permittee of the right to object to the proposed revocation. The issuing officer may amend any notice of revocation at any time.

(2) Upon receipt of a notice of proposed revocation the permittee may file a written objection to the proposed action. Such objection must be in writing, must be filed within 45 calendar days of the date of the notice of proposal, must state the reasons why the permittee objects to the proposed revocation, and may include supporting documentation.

(3) A decision on the revocation shall be made within 45 days after the end of the objection period. The issuing officer shall notify the permittee in writing of the Service's decision and the reasons therefore, together with the information concerning the right to request and the procedures for requesting reconsideration.

(4) Unless a permittee files a timely request for reconsideration, any wildlife held under authority of a permit that is revoked must be disposed of in accordance with instructions of the issuing officer. If a permittee files a timely request for reconsideration of a proposed revocation, such permittee may retain possession of any wildlife held under authority of the permit until final disposition of the appeal process.

[54 FR 38149, Sept. 14, 1989]

§ 13.29 Review procedures.

(a) *Request for reconsideration.* Any person may request reconsideration of an action under this part if that person is one of the following:

(1) An applicant for a permit who has received written notice of denial;

(2) An applicant for renewal who has received written notice that a renewal is denied;

(3) A permittee who has a permit amended, suspended, or revoked, except for those actions which are required by changes in statutes or regulations, or are emergency changes of limited applicability for which an expiration date is set within 90 days of the permit change; or

(4) A permittee who has a permit issued or renewed but has not been granted authority by the permit to perform all activities requested in the application, except when the activity requested is one for which there is no lawful authority to issue a permit.

(b) *Method of requesting reconsideration.* Any person requesting reconsideration of an action under this part must comply with the following criteria:

(1) Any request for reconsideration must be in writing, signed by the person requesting reconsideration or by the legal representative of that person, and must be submitted to the issuing officer.

(2) The request for reconsideration must be received by the issuing officer within 45 calendar days of the date of notification of the decision for which reconsideration is being requested.

(3) The request for reconsideration shall state the decision for which reconsideration is being requested and shall state the reason(s) for the reconsideration, including presenting any new information or facts pertinent to the issue(s) raised by the request for reconsideration.

(4) The request for reconsideration shall contain a certification in substantially the same form as that provided by § 13.12(a)(5). If a request for reconsideration does not contain such certification, but is otherwise timely

and appropriate, it shall be held and the person submitting the request shall be given written notice of the need to submit the certification within 15 calendar days. Failure to submit certification shall result in the request being rejected as insufficient in form and content.

(c) *Inquiry by the Service.* The Service may institute a separate inquiry into the matter under consideration.

(d) *Determination of grant or denial of a request for reconsideration.* The issuing officer shall notify the permittee of the Service's decision within 45 days of the receipt of the request for reconsideration. This notification shall be in writing, shall state the reasons for the decision, and shall contain a description of the evidence which was relied upon by the issuing officer. The notification shall also provide information concerning the right to appeal, the official to whom an appeal may be addressed, and the procedures for making an appeal.

(e) *Appeal.* A person who has received an adverse decision following submission of a request for reconsideration may submit a written appeal to the Regional Director for the region in which the issuing office is located, or to the Director for offices which report directly to the Director. An appeal must be submitted within 45 days of the date of the notification of the decision on the request for reconsideration. The appeal shall state the reason(s) and issue(s) upon which the appeal is based and may contain any additional evidence or arguments to support the appeal.

(f) *Decision on appeal.* (1) Before a decision is made concerning the appeal the appellant may present oral arguments before the Regional Director or the Director, as appropriate, if such official judges oral arguments are necessary to clarify issues raised in the written record.

(2) The Service shall notify the appellant in writing of its decision within 45 calendar days of receipt of the appeal, unless extended for good cause and the appellant notified of the extension.

(3) The decision of the Regional Director or the Director shall constitute the final administrative decision of the Department of the Interior.

[54 FR 38149, Sept. 14, 1989]

Subpart D—Conditions

§ 13.41 Humane conditions.

Any live wildlife possessed under a permit must be maintained under humane and healthful conditions.

[54 FR 38150, Sept. 14, 1989]

§ 13.42 Permits are specific.

The authorizations on the face of a permit which set forth specific times, dates, places, methods of taking, numbers and kinds of wildlife or plants, location of activity, authorize certain circumscribed transactions, or otherwise permit a specifically limited matter, are to be strictly construed and shall not be interpreted to permit similar or related matters outside the scope of strict construction.

[39 FR 1161, Jan. 4, 1974, as amended at 42 FR 32377, June 24, 1977]

§ 13.43 Alteration of permits.

Permits shall not be altered, erased, or mutilated, and any permit which has been altered, erased, or mutilated shall immediately become invalid. Unless specifically permitted on the face thereof, no permit shall be copied, nor shall any copy of a permit issued pursuant to this subchapter B be displayed, offered for inspection, or otherwise used for any official purpose for which the permit was issued.

§ 13.44 Display of permit.

Any permit issued under this part shall be displayed for inspection upon request to the Director or his agent, or to any other person relying upon its existence.

§ 13.45 Filing of reports.

Permittees may be required to file reports of the activities conducted under the permit. Any such reports shall be filed not later than March 31 for the preceding calendar year ending December 31, or any portion thereof, during which a permit was in force, unless the regulations of this subchapter B or the provisions of the permit set forth other reporting requirements.

§ 13.46 Maintenance of records.

From the date of issuance of the permit, the permittee shall maintain complete and accurate records of any taking, possession, transportation, sale, purchase, barter, exportation, or importation of plants obtained from the wild (excluding seeds) or wildlife pursuant to such permit. Such records shall be kept current and shall include names and addresses of persons with whom any plant obtained from the wild (excluding seeds) or wildlife has been purchased, sold, bartered, or otherwise transferred, and the date of such transaction, and such other information as may be required or appropriate. Such records shall be legibly written or reproducible in English and shall be maintained for five years from the date of expiration of the permit.

[39 FR 1161, Jan. 4, 1974, as amended at 42 FR 32377, June 24, 1977; 54 FR 38150, Sept. 14, 1989]

§ 13.47 Inspection requirement.

Any person holding a permit under this subchapter B shall allow the Director's agent to enter his premises at any reasonable hour to inspect any wildlife or plant held or to inspect, audit, or copy any permits, books, or records required to be kept by regulations of this subchapter B.

[39 FR 1161, Jan. 4, 1974, as amended at 42 FR 32377, June 24, 1977]

§ 13.48 Compliance with conditions of permit.

Any person holding a permit under subchapter B and any person acting under authority of such permit must comply with all conditions of the permit and with all appllicable laws and regulations governing the permitted activity.

[54 FR 38150, Sept. 14, 1989]

§ 13.49 Surrender of permit.

Any person holding a permit under subchapter B shall surrender such permit to the issuing officer upon notification that the permit has been suspended or revoked by the Service, and all appeal procedures have been exhausted.

[54 FR 38150, Sept. 14, 1989]

§ 13.50 Acceptance of liability.

Any person holding a permit under subchapter B assumes all liability and responsibility for the conduct of any activity conducted under the authority of such permit.

[54 FR 38150, Sept. 14, 1989]

PART 14—IMPORTATION, EXPORTATION, AND TRANSPORTATION OF WILDLIFE

Subpart A—Introduction

Subpart B—Importation and Exportation at Designated Ports

Subpart C—Designated Port Exception Permits

Subpart D—[Reserved]

Subpart E—Inspection and Clearance of Wildlife

270—52 FR 21480; June 5, 1987.
271—52 FR 21484; June 5, 1987.
274—52 FR 22589; June 12, 1987.
275—52 FR 22933; June 16, 1987.
276—52 FR 22936; June 16, 1987.
277—52 FR 22939; June 16, 1987.
285—52 FR 32929; September 1, 1987.
286—52 FR 34917; September 16, 1987.
291—52 FR 36270; September 28, 1987.
293—52 FR 37420; October 6, 1987.
295—52 FR 41440; October 28, 1987.
297—52 FR 42071; November 2, 1987.
298—52 FR 42657; November 6, 1987.
300—52 FR 44401; November 19, 1987.
301—52 FR 46087; December 4, 1987.
302—53 FR 3565; February 5, 1988.
303—53 FR 3567; February 5, 1988.
305—53 FR 4629; February 17, 1988.
306—53 FR 10884; April 4, 1988.
307—53 FR 11612; April 7, 1988.
308—53 FR 11615; April 7, 1988.
309—53 FR 23742; June 23, 1988.
310—53 FR 23745; June 23, 1988.
311—53 FR 23748; June 23, 1988.
314—53 FR 27137; July 18, 1988.
315—53 FR 27141; July 18, 1988.
318—53 FR 32827; August 26, 1988.
319—53 FR 32830; August 26, 1988.
321—53 FR 33996; September 1, 1988.
324—53 FR 34701; September 7, 1988.
325—53 FR 34705; September 7, 1988.
326—53 FR 35080; September 9, 1988.
329—53 FR 37972; September 28, 1988.
330—53 FR 37975; September 28, 1988.
331—53 FR 37978; September 28, 1988.
332—53 FR 37982; September 28, 1988.
333—53 FR 38451; September 30, 1988.
35—53 FR 38456; September 30, 1988.
39—53 FR 38474; September 30, 1988.
41—53 FR 45861; November 14, 1988.
43—54 FR 2134; January 19, 1989.
14—54 FR 5938; February 7, 1989.
16—54 FR 10154; March 10, 1989.
17—54 FR 14967; April 14, 1989.
2—54 FR 29658; July 13, 1989.
3—54 FR 29663; July 13, 1989.
4—54 FR 29730; July 14, 1989.
5—54 FR 30554; July 21, 1989.
5—54 FR 31196; July 27, 1989.
—54 FR 35305; August 24, 1989.
—54 FR 38947; September 21, 1989.
—54 FR 38950; September 21, 1989.
—54 FR 39857; September 28, 1989.
—54 FR 39863; September 28, 1989.
—55 FR 433; January 5, 1990.
—55 FR 4157; February 6, 1990.
—55 FR 4159; February 6, 1990.
—55 FR 12790; April 5, 1990.
FR 12793; April 5, 1990.
381—55 FR 12797; April 5, 1990.
385—55 FR 13491; April 10, 1990.
386—55 FR 13911; April 13, 1990.
389—55 FR 24246; June 15, 1990.
392—55 FR 25599; June 21, 1990.
395—55 FR 29370; July 19, 1990.
397—55 FR 32255; August 8, 1990.
398—55 FR 32257; August 8, 1990.
402—55 FR 39864; September 28, 1990.
403—55 FR 39867; September 28, 1990.
406—55 FR 49050; November 26, 1990.
409—55 FR 50187; December 5, 1990.
413—56 FR 1453; January, 14, 1991.
414—56 FR 1457; January, 14, 1991.
418—56 FR 1936; January, 18, 1991.
420—56 FR 16024; April 19, 1991.
422—56 FR 19959; May 1, 1991.
424—56 FR 21091; May 7, 1991.
425—56 FR 21096; May 7, 1991.
429—56 FR 32983; July 18, 1991.
430—56 FR 34154; July 26, 1991.
434—56 FR 46239; September 11, 1991.
435—56 FR 47694; September 20, 1991.
436—56 FR 47699; September 20, 1991.
437—56 FR 48751; September 20, 1991.
438—56 FR 48755; September 20, 1991.
439—56 FR 49636; September 30, 1991.
440—56 FR 49639; September 30, 1991.
441—56 FR 49643; September 30, 1991.
445—56 FR 49853; October 2, 1991.
448—56 FR 55785; October 29, 1991.
450—56 FR 57849; November 14, 1991.
451—56 FR 60937; November 29, 1991.
452—56 FR 60940; November 29, 1991.
453—56 FR 61182; December 2, 1991.
457—57 FR 1403; January 14, 1992.
458—57 FR 2053; January 17, 1992.
460—57 FR 14653; April 22, 1992.
461—57 FR 14785; April 22, 1992.
463—57 FR 19819; May 8, 1992.
464—57 FR 20588; May 13, 1992.
465—57 FR 20592; May 13, 1992.
466—57 FR 20595; May 13, 1992.
467—57 FR 20787; May 15, 1992.
468—57 FR 21564; May 20, 1992.
470—57 FR 21574; May 20, 1992.
471—57 FR 24199; June 8, 1992.
472—57 FR 27858; June 22, 1992.
473—57 FR 27863; June 22, 1992.
474—57 FR 27867; June 22, 1992.
476—57 FR 30168; July 8, 1992.
477—57 FR 44340; September 25, 1992.
478—57 FR 44708; September 29, 1992.
480—57 FR 46339; October 8, 1992.
481—57 FR 46344; October 8, 1992.
482—57 FR 46747; October 28, 1992.
490—58 FR 8242; February 12, 1993.
491—58 FR 11552; February 26, 1993.
497—58 FR 18035; April 7, 1993.

498—58 FR 18041; April 7, 1993.
500—58 FR 25754; April 27, 1993.
501—58 FR 25758; April 27, 1993.
504—58 FR 32311; June 9, 1993.
506—58 FR 35891; July 2, 1993.
507—58 FR 37443; July 12, 1993.
509—58 FR 40547; July 28, 1993.
510—58 FR 40551; July 28, 1993.
511—58 FR 41383; August 3, 1993.
512—58 FR 41391; August 3, 1993.
515—58 FR 49879; September 23, 1993.
519—58 FR 52030; October 6 1993.
521—58 FR 53807; October 10/18/93.
523—58 FR 62050; November 24, 1993.
524—58 FR 68480; December 27, 1993
528—59 FR 5510; February 4 1994.
529—59 FR 8141; February 18 1994.
530—59 FR 9327; February 25, 1994.
531—59 FR 10324; March 2, 1994.
532—59 FR 10324; March 4, 1994.
535—59 FR 13840; March 23, 1994.
536—59 FR 14493; March 28, 1994.
537—59 FR 15345; April 1, 1994.
541—59 FR 32937; June 27, 1994.
542—59 FR 35864; July 14, 1994.
544—59 FR 42176; August 17, 1994.
547—59 FR 43652; August 24, 1994.
548—59 FR 43652; August 24, 1994.
551—59 FR 46718; September 9, 1994.
553—59 FR 49031; September 26, 1994.
555—59 FR 49863; September 30, 1994.
556—59 FR 50857; October 6, 1994.
558—59 FR 56333; November 10, 1994.
559—59 FR 56350; November 10, 1994.
560—59 FR 59177; November 16, 1994.
564—59 FR 60568; November 25, 1994.
565—59 FR 62352; December 5, 1994.
567—59 FR 64623; December 15, 1994.
570—60 FR 61; January 3, 1995.
572—60 FR 3562; January 18, 1995.
575—60 FR 6684; February 3, 1995.
578—60 FR 12846; March 7, 1995.
581—60 FR 10697; March 15, 1996.
584—61 FR 31058; June 19, 1996.
586—61 FR 41023; August 7, 1996.
587—61 FR 43184; August 21, 1996.

[48 FR 34182, July 27, 1983]

EDITORIAL NOTE 1: For FEDERAL REGISTER citations affecting the table in §17.12(h), see the listing above.

EDITORIAL NOTE: For FEDERAL REGISTER citations affecting §17.12, see the List of CFR Sections Affected appearing in the Finding Aids section of this volume.

Subpart C—Endangered Wildlife

§ 17.21 Prohibitions.

(a) Except as provided in subpart A of this part, or under permits issued pursuant to §17.22 or §17.23, it is unlawful for any person subject to the jurisdiction of the United States to commit, to attempt to commit, to solicit another to commit or to cause to be committed, any of the acts described in paragraphs (b) through (f) of this section in regard to any endangered wildlife.

(b) *Import or export.* It is unlawful to import or to export any endangered wildlife. Any shipment in transit through the United States is an importation and an exportation, whether or not it has entered the country for customs purposes.

(c) *Take.* (1) It is unlawful to take endangered wildlife within the United States, within the territorial sea of the United States, or upon the high seas. The high seas shall be all waters seaward of the territorial sea of the United States, except waters officially recognized by the United States as the territorial sea of another country, under international law.

(2) Notwithstanding paragraph (c)(1) of this section, any person may take endangered wildlife in defense of his own life or the lives of others.

(3) Notwithstanding paragraph (c)(1) of this section, any employee or agent of the Service, any other Federal land management agency, the National Marine Fisheries Service, or a State conservation agency, who is designated by his agency for such purposes, may, when acting in the course of his official duties, take endangered wildlife without a permit if such action is necessary to:

(i) Aid a sick, injured or orphaned specimen; or

(ii) Dispose of a dead specimen; or

(iii) Salvage a dead specimen which may be useful for scientific study; or

(iv) Remove specimens which constitute a demonstrable but nonimmediate threat to human safety, provided that the taking is done in a humane manner; the taking may involve killing or injuring only if it has not been reasonably possible to eliminate such threat by live-capturing and releasing

the specimen unharmed, in a remote area.

(4) Any taking pursuant to paragraphs (c) (2) and (3) of this section must be reported in writing to the U.S. Fish and Wildlife Service, Division of Law Enforcement, P.O. Box 19183, Washington, DC 20036, within 5 days. The specimen may only be retained, disposed of, or salvaged in accordance with directions from Service.

(5) Notwithstanding paragraph (c)(1) of this section, any qualified employee or agent of a State Conservation Agency which is a party to a Cooperative Agreement with the Service in accordance with section 6(c) of the Act, who is designated by his agency for such purposes, may, when acting in the course of his official duties take those endangered species which are covered by an approved cooperative agreement for conservation programs in accordance with the Cooperative Agreement, provided that such taking is not reasonably anticipated to result in:

(i) The death or permanent disabling of the specimen;

(ii) The removal of the specimen from the State where the taking occurred;

(iii) The introduction of the specimen so taken, or of any progeny derived from such a specimen, into an area beyond the historical range of the species; or

(iv) The holding of the specimen in captivity for a period of more than 45 consecutive days.

(d) *Possession and other acts with unlawfully taken wildlife.* (1) It is unlawful to possess, sell, deliver, carry, transport, or ship, by any means whatsoever, any endangered wildlife which was taken in violation of paragraph (c) of this section.

Example. A person captures a whooping crane in Texas and gives it to a second person, who puts it in a closed van and drives thirty miles, to another location in Texas. The second person then gives the whooping crane to a third person, who is apprehended with the bird in his possession. All three have violated the law—the first by illegally taking the whooping crane; the second by transporting an illegally taken whooping crane; and the third by possessing an illegally taken whooping crane.

(2) Notwithstanding paragraph (d)(1) of this section, Federal and State law enforcement officers may possess, deliver, carry, transport or ship any endangered wildlife taken in violation of the Act as necessary in performing their official duties.

(e) *Interstate or foreign commerce.* It is unlawful to deliver, receive, carry, transport, or ship in interstate or foreign commerce, by any means whatsoever, and in the course of a commercial activity, any endangered wildlife.

(f) *Sale or offer for sale.* (1) It is unlawful to sell or to offer for sale in interstate or foreign commerce any endangered wildlife.

(2) An advertisement for the sale of endangered wildlife which carries a warning to the effect that no sale may be consummated until a permit has been obtained from the U.S. Fish and Wildlife Service shall not be considered an offer for sale within the meaning of this section.

(g) *Captive-bred wildlife.* (1) Notwithstanding paragraphs (b), (c), (e) and (f) of this section, any person may take; import or export; deliver, receive, carry, transport or ship in interstate or foreign commerce, in the course of a commercial activity; or sell or offer for sale in interstate or foreign commerce any endangered wildlife that is bred in captivity in the United States, provided the principal purpose of these activities is to facilitate captive breeding, and provided the following conditions are met:

(i) The wildlife is a species having a natural geographic distribution not including any part of the United States, or the wildlife is a species that the Director has determined to be eligible in accordance with paragraph (g)(5) of this section;

(ii) The purpose of such activity is to enhance the propagation or survival of the affected species;

(iii) Such activity does not involve interstate or foreign commerce, in the course of a commercial activity, with respect to non-living wildlife;

(iv) Each specimen of wildlife to be imported is uniquely identified by a band, tattoo or other means that was reported in writing to an official of the Service at a port of export prior to export from the United States, and

(v) Any person subject to the jurisdiction of the United States who engages in any of the activities authorized by this paragraph does so in accordance with paragraphs (g) (2), (3) and (4) of this section.

(2) Any person subject to the jurisdiction of the United States seeking to engage in any of the activities authorized by this paragraph must first register with the Service (Federal Wildlife Permit Office, U.S. Fish and Wildlife Service, Washington, DC 20240). Requests for registration must be submitted on an official application form (Form 3–200) provided by the Service, and must include the following information:

(i) The types of wildlife sought to be covered by the registration, identified by common and scientific name to the taxonomic level of family, genus or species;

(ii) A description of the applicant's experience in maintaining and propagating the types of wildlife sought to be covered by the registration, or in conducting research directly related to maintaining and propagating such wildlife;

(iii) A description, if appropriate, of the means by which the applicant intends to educate the public about the ecological role and conservation needs of the affected species;

(iv) Photograph(s) or other evidence clearly depicting the facilities where such wildlife will be maintained; and

(v) A copy of the applicant's license or registration, if any, under the animal welfare regulations of the U.S. Department of Agriculture (9 CFR part 2).

(3) Upon receiving a complete application, the Director will decide whether or not the registration will be approved. In making his decision, the Director will consider, in addition to the general criteria in § 13.2(b) of this subchapter, whether the expertise, facilities or other resources available to the applicant appear adequate to enhance the propagation or survival of the affected wildlife. Each person so registered must maintain accurate written records of activities conducted under the registration and must submit to the Director a written annual report of such activities.

(4) Any person subject to the jurisdiction of the United States seeking to export or conduct foreign commerce in captive-bred endangered wildlife which will not remain under the care of that person must first obtain approval by providing written evidence to satisfy the Director that the proposed recipient of the wildlife has expertise, facilities or other resources adequate to enhance the propagation or survival of such wildlife and that the proposed recipient will use such wildlife for purposes of enhancing the propagation or survival of the affected species.

(5)(i) The Director shall use the following criteria to determine if wildlife of any species having a natural geographic distribution that includes any part of the United States is eligible for the provisions of this paragraph:

(A) Whether there is a low demand for taking of the species from wild populations, either because of the success of captive breeding or because of other reasons, and

(B) Whether the wild populations of the species are effectively protected from unauthorized taking as a result of the inaccessibility of their habitat to man or as a result of the effectiveness of law enforcement.

(ii) The Director shall follow the procedures set forth in section 4(b) and section 4(f)(2)(A) of the Act and in the regulations promulgated thereunder with respect to petitions and notification of the public and governors of affected States when determining the eligibility of species for purposes of this paragraph.

(iii) In accordance with the criteria in paragraph (g)(5)(i) of this section, the Director has determined the following species to be eligible for the provisions of this paragraph:

Laysan teal (*Anas laysanensis*).

[40 FR 44415, Sept. 26, 1975, as amended at 40 FR 53400, Nov. 18, 1975; 41 FR 19226, May 11, 1976; 44 FR 31580, May 31, 1979; 44 FR 54007, Sept. 17, 1979; 58 FR 68325, Dec. 27, 1993]

§ 17.22 Permits for scientific purposes, enhancement of propagation or survival, or for incidental taking.

Upon receipt of a complete application, the Director may issue a permit authorizing any activity otherwise prohibited by § 17.21, in accordance with the issuance criteria of this section, for scientific purposes, for enhancing the

propagation or survival, or for the incidental taking of endangered wildlife. Such permits may authorize a single transaction, a series of transactions, or a number of activities over a specific period of time. (See § 17.32 for permits for threatened species.) The Director shall publish notice in the FEDERAL REGISTER of each application for a permit that is made under this section. Each notice shall invite the submission from interested parties, within 30 days after the date of the notice, of written data, views, or arguments with respect to the application. The 30-day period may be waived by the Director in an emergency situation where the life or health of an endangered animal is threatened and no reasonable alternative is available to the applicant. Notice of any such waiver shall be published in the FEDERAL REGISTER within 10 days following issuance of the permit.

(a)(1) *Application requirements for permits for scientific purposes or for the enhancement of propagation or survival.* Applications for permits under this paragraph must be submitted to the Director, U.S. Fish and Wildlife Service, Federal Wildlife Permit Office, 1000 N. Glebe Road, Room 611, Arlington, Virginia 22201, by the person wishing to engage in the activity prohibited by § 17.21. Each application must be submitted on an official application (Form 3–200) provided by the Service and must include as an attachment, all of the following information:

(i) The common and scientific names of the species sought to the covered by the permit, as well as the number, age, and sex of such species, and the activity sought to be authorized (such as taking, exporting, selling in interstate commerce);

(ii) A statement as to whether, at the time of application, the wildlife sought to be covered by the permit (A) is still in the wild, (B) has already been removed from the wild, or (C) was born in captivity;

(iii) A resume of the applicant's attempts to obtain the wildlife sought to be covered by the permit in a manner which would not cause the death or removal from the wild of such wildlife;

(iv) If the wildlife sought to be covered by the permit has already been removed from the wild, the country and place where such removal occurred; if the wildlife sought to be covered by the permit was born in captivity, the country and place where such wildlife was born;

(v) A complete description and address of the institution or other facility where the wildlife sought to be covered by the permit will be used, displayed, or maintained;

(vi) If the applicant seeks to have live wildlife covered by the permit, a complete description, including photographs or diagrams, of the facilities to house and/or care for the wildlife and a resume of the experience of those person who will be caring for the wildlife;

(vii) A full statement of the reasons why the applicant is justified in obtaining a permit including the details of the activities sought to be authorized by the permit;

(viii) If the application is for the purpose of enhancement of propagation, a statement of the applicant's willingness to participate in a cooperative breeding program and to maintain or contribute data to a studbook;

(ix) The information collection requirements contained in this paragraph have been approved by the Office of Management and Budget under 44 U.S.C. 3507 and assigned Clearance Number 1018–0022. This information is being collected to provide information necessary to evaluate permit applications and make decisions, according to criteria established in various Federal wildlife and plant conservation statutes and regulations, on the issuance or denial of permits. The obligation to respond is required to obtain or retain a permit.

(2) *Issuance criteria.* Upon receiving an application completed in accordance with paragraph (a)(1) of this section, the Director will decide whether or not a permit should be issued. In making this decision, the Director shall consider, in addition to the general criteria in § 13.21(b) of this subchapter, the following factors:

(i) Whether the purpose for which the permit is required is adequate to justify removing from the wild or otherwise changing the status of the wildlife sought to be covered by the permit;

(ii) The probable direct and indirect effect which issuing the permit would have on the wild populations of the wildlife sought to be covered by the permit;

(iii) Whether the permit, if issued, would in any way, directly or indirectly, conflict with any known program intended to enhance the survival probabilities of the population from which the wildlife sought to be covered by the permit was or would be removed;

(iv) Whether the purpose for which the permit is required would be likely to reduce the threat of extinction facing the species of wildlife sought to be covered by the permit;

(v) The opinions or views of scientists or other persons or organizations having expertise concerning the wildlife or other matters germane to the application; and

(vi) Whether the expertise, facilities, or other resources available to the applicant appear adequate to successfully accomplish the objectives stated in the application.

(3) *Permit conditions.* In addition to the general conditions set forth in part 13 of this subchapter, every permit issued under this paragraph shall be subject to the special condition that the escape of living wildlife covered by the permit shall be immediately reported to the Service office designated in the permit.

(4) *Duration of permits.* The duration of permits issued under this paragraph shall be designated on the face of the permit.

(b)(1) *Application requirements for permits for incidental taking.* Applications for permits under this paragraph must be submitted to the Director, U.S. Fish and Wildlife Service, Federal Wildlife Permit Office, 1000 N. Glebe Road, Room 611, Arlington, Virginia 22201, by the person wishing to engage in the activity prohibited by § 17.21(c). Each application must be submitted on an official application (Form 3–200) provided by the Service and must include as an attachment all of the following information:

(i) A complete description of the activity sought to be authorized;

(ii) The common and scientific names of the species sought to be covered by the permit, as well as the number, age, and sex of such species, if known;

(iii) A conservation plan that specifies:

(A) The impact that will likely result from such taking;

(B) What steps the applicant will take to monitor, minimize, and mitigate such impacts, the funding that will be available to implement such steps, and the procedures to be used to deal with unforeseen circumstances;

(C) What alternative actions to such taking the applicant considered and the reasons why such alternatives are not proposed to be utilized; and

(D) Such other measures that the Director may require as being necessary or appropriate for purposes of the plan;

(iv) The information collection requirements contained in this paragraph have been approved by the Office of Management and Budget under 44 U.S.C. 3507 and assigned Clearance Number 1018–0022. This information is being collected to provide information necessary to evaluate permit applications. This information will be used to review permit applications and make decisions, according to criteria established in various Federal wildlife and plant conservation statutes and regulations, on the issuance or denial of permits. The obligation to respond is required to obtain or retain a permit.

(2) *Issuance criteria.* Upon receiving an application completed in accordance with paragraph (b)(1) of this section, the Director will decide whether or not a permit should be issued. The Director shall consider the general criteria in § 13.21(b) of this subchapter and shall issue the permit if he finds that: (i) The taking will be incidental; (ii) the applicant will, to the maximum extent practicable, minimize and mitigate the impacts of such taking; (iii) the applicant will ensure that adequate funding for the conservation plan and procedures to deal with unforeseen circumstances will be provided; (iv) the taking will not appreciably reduce the likelihood of the survival and recovery of the species in the wild; (v) the measures, if any, required under paragraph (b)(1)(iii)(D) of this section will be met; and (vi) he has received such other assurances as he may require that the plan will be implemented. In making

his decision, the Director shall also consider the anticipated duration and geographic scope of the applicant's planned activities, including the amount of listed species habitat that is involved and the degree to which listed species and their habitats are affected.

(3) *Permit conditions.* In addition to the general conditions set forth in part 13 of this subchapter, every permit issued under this paragraph shall contain such terms and conditions as the Director deems necessary or appropriate to carry out the purposes of the permit and the conservation plan including, but not limited to, monitoring and reporting requirements deemed necessary for determining whether such terms and conditions are being complied with. The Director shall rely upon existing reporting requirements to the maximum extent practicable.

(4) *Duration of permits.* The duration of permits issued under this paragraph shall be sufficient to provide adequate assurances to the permittee to commit funding necessary for the activities authorized by the permit, including conservation activities and land use restrictions. In determining the duration of a permit, the Director shall consider the duration of the planned activities, as well as the possible positive and negative effects associated with permits of the proposed duration on listed species, including the extent to which the conservation plan will enhance the habitat of listed species and increase the long-term survivability of such species.

(c) *Objection to permit issuance.* (1) In regard to any notice of a permit application published in the FEDERAL REGISTER, any interested party that objects to the issuance of a permit, in whole or in part, may, during the comment period specified in the notice, request notification of the final action to be taken on the application. A separate written request shall be made for each permit application. Such a request shall specify the Service's permit application number and state the reasons why that party believes the applicant does not meet the issuance criteria contained in §§ 13.21 and 17.22 of this subchapter or other reasons why the permit should not be issued.

(2) If the Service decides to issue a permit contrary to objections received pursuant to paragraph (c)(1) of this section, then the Service shall, at least ten days prior to issuance of the permit, make reasonable efforts to contact by telephone or other expedient means, any party who has made a request pursuant to paragraph (c)(1) of this section and inform that party of the issuance of the permit. However, the Service may reduce the time period or dispense with such notice if it determines that time is of the essence and that delay in issuance of the permit would: (i) Harm the specimen or population involved; or (ii) unduly hinder the actions authorized under the permit.

(3) The Service will notify any party filing an objection and request for notice under paragraph (c)(1) of this section of the final action taken on the application, in writing. If the Service has reduced or dispensed with the notice period referred to in paragraph (c)(2) of this section, it will include its reasons therefore in such written notice.

[50 FR 39687, Sept. 30, 1985]

§ 17.23 Economic hardship permits.

Upon receipt of a complete application, the Director may issue a permit authorizing any activity otherwise prohibited by § 17.21, in accordance with the issuance criteria of this section in order to prevent undue economic hardship. The Director shall publish notice in the FEDERAL REGISTER of each application for a permit that is made under this section. Each notice shall invite the submission from interested parties, within 30 days after the date of the notice, of written data, views, or arguments with respect to the application. The 30-day period may be waived by the Director in an emergency situation where the life or health of an endangered animal is threatened and no reasonable alternative is available to the applicant. Notice of any such waiver shall be published in the FEDERAL REGISTER within 10 days following issuance of the permit.

(a) *Application requirements.* Applications for permits under this section must be submitted to the Director by the person allegedly suffering undue economic hardship because his desired activity is prohibited by § 17.21. Each

application must be submitted on an official application form (Form 3–200) provided by the Service, and must include, as an attachment, all of the information required in § 17.22 plus the following additional information:

(1) The possible legal, economic or subsistence alternatives to the activity sought to be authorized by the permit;

(2) A full statement, accompanied by copies of all relevant contracts and correspondence, showing the applicant's involvement with the wildlife sought to be covered by the permit (as well as his involvement with similar wildlife), including, where applicable, that portion of applicant's income derived from the taking of such wildlife, or the subsistence use of such wildlife, during the calendar year immediately preceding either the notice in the FEDERAL REGISTER of review of the status of the species or of the proposal to list such wildlife as endangered, whichever is earliest;

(3) Where applicable, proof of a contract or other binding legal obligation which:

(i) Deals specifically with the wildlife sought to be covered by the permit;

(ii) Became binding prior to the date when the notice of a review of the status of the species or the notice of proposed rulemaking proposing to list such wildlife as endangered was published in the FEDERAL REGISTER, whichever is earlier; and

(iii) Will cause monetary loss of a given dollar amount if the permit sought under this section is not granted.

(b) *Issuance criteria.* Upon receiving an application completed in accordance with paragraph (a) of this section, the Director will decide whether or not a permit should be issued under any of the three categories of economic hardship, as defined in section 10(b)(2) of the Act. In making his decisions, the Director shall consider, in addition to the general criteria in § 13.21(b) of this subchapter, the following factors:

(1) Whether the purpose for which the permit is being requested is adequate to justify removing from the wild or otherwise changing the status of the wildlife sought to be covered by the permit;

(2) The probable direct and indirect effect which issuing the permit would have on the wild populations of the wildlife sought to be covered by the permit;

(3) The economic, legal, subsistence, or other alternatives or relief available to the applicant;

(4) The amount of evidence that the applicant was in fact party to a contract or other binding legal obligation which;

(i) Deals specifically with the wildlife sought to be covered by the permit; and

(ii) Became binding prior to the date when the notice of a review of the status of the species or the notice of proposed rulemaking proposing to list such wildlife as endangered was published in the FEDERAL REGISTER, whichever is earlier.

(5) The severity of economic hardship which the contract or other binding legal obligation referred to in paragraph (b)(4) of this section would cause if the permit were denied;

(6) Where applicable, the portion of the applicant's income which would be lost if the permit were denied, and the relationship of that portion to the balance of his income;

(7) Where applicable, the nature and extent of subsistence taking generally by the applicant; and

(8) The likelihood that applicant can reasonably carry out his desired activity within one year from the date a notice is published in the FEDERAL REGISTER to review status of such wildlife, or to list such wildlife as endangered, whichever is earlier.

(c) *Permit conditions.* In addition to the general conditions set forth in part 13 of this subchapter, every permit issued under this section shall be subject to the following special conditions:

(1) In addition to any reporting requirements contained in the permit itself, the permittee shall also submit to the Director a written report of his activities pursuant to the permit. Such report must be postmarked or actually delivered no later than 10 days after completion of the activity.

(2) The death or escape of all living wildlife covered by the permit shall be immediately reported to the Service's office designated in the permit.

(d) Duration of permits issued under this section shall be designated on the face of the permit. No permit issued under this section, however, shall be valid for more than one year from the date a notice is published in the FEDERAL REGISTER to review status of such wildlife, or to list such wildlife as endangered, whichever is earlier.

[40 FR 44415, Sept. 26, 1975, as amended at 40 FR 53400, Nov. 18, 1975; 40 FR 58307, Dec. 16, 1975; 50 FR 39688, Sept. 30, 1985]

Subpart D—Threatened Wildlife

§ 17.31 Prohibitions.

(a) Except as provided in subpart A of this part, or in a permit issued under this subpart, all of the provisions in § 17.21 shall apply to threatened wildlife, except § 17.21(c)(5).

(b) In addition to any other provisions of this part 17, any employee or agent of the Service, of the National Marine Fisheries Service, or of a State conservation agency which is operating a conservation program pursuant to the terms of a Cooperative Agreement with the Service in accordance with section 6(c) of the Act, who is designated by his agency for such purposes, may, when acting in the course of his official duties, take those threatened species of wildlife which are covered by an approved cooperative agreement to carry out conservation programs.

(c) Whenever a special rule in §§ 17.40 to 17.48 applies to a threatened species, none of the provisions of paragraphs (a) and (b) of this section will apply. The special rule will contain all the applicable prohibitions and exceptions.

[43 FR 18181, Apr. 28, 1978, as amended at 44 FR 31580, May 31, 1979]

§ 17.32 Permits—general.

Upon receipt of a complete application the Director may issue a permit for any activity otherwise prohibited with regard to threatened wildlife. Such permit shall be governed by the provisions of this section unless a special rule applicable to the wildlife, appearing in §§ 17.40 to 17.48, of this part provides otherwise. Permits issued under this section must be for one of the following purposes: Scientific purposes, or the enhancement of propagation or survival, or economic hardship, or zoological exhibition, or educational purposes, or incidental taking, or special purposes consistent with the purposes of the Act. Such permits may authorize a single transaction, a series of transactions, or a number of activities over a specific period of time.

(a)(1) *Application requirements for scientific purposes, or the enhancement of propagation or survival, or economic hardship, or zoological exhibition, or educational purposes, or special purposes consistent with the purposes of the Act.* Applications for permits under this paragraph must be submitted to the Director, U.S. Fish and Wildlife Service, Federal Wildlife Permit Office, 1000 N. Glebe Road, Room 611, Arlington, Virginia 22201, by the person wishing to engage in the prohibited activity. Each application must be submitted on an official application (Form 3–200), provided by the Service, and must include, as an attachment, as much of the following information which relates to the purpose for which the applicant is requesting a permit:

(i) The Common and scientific names of the species sought to be covered by the permit, as well as the number, age, and sex of such species, and the activity sought to be authorized (such as taking, exporting, selling in interstate commerce);

(ii) A statement as to whether, at the time of application, the wildlife sought to be covered by the permit (A) is still in the wild, (B) has already been removed from the wild, or (C) was born in captivity;

(iii) A resume of the applicant's attempts to obtain the wildlife sought to be covered by the permit in a manner which would not cause the death or removal from the wild of such wildlife;

(iv) If the wildlife sought to be covered by the permit has already been removed from the wild, the country and place where such removal occurred; if the wildlife sought to be covered by permit was born in captivity, the country and place where such wildlife was born;

(v) A complete description and address of the institution or other facility where the wildlife sought to be covered by the permit will be used, displayed, or maintained;

(vi) If the applicant seeks to have live wildlife covered by the permit, a complete description, including photographs or diagrams, of the facilities to house and/or care for the wildlife and a resume of the experience of those persons who will be caring for the wildlife;

(vii) A full statement of the reasons why the applicant is justified in obtaining a permit including the details of the activities sought to be authorized by the permit;

(viii) If the application is for the purpose of enhancement of propagation, a statement of the applicant's willingness to participate in a cooperative breeding program and to maintain or contribute data to a studbook;

(ix) The information collection requirements contained in this paragraph have been approved by the Office of Management and Budget under 44 U.S.C. 3507 and assigned Clearance Number 1018–0022. This information is being collected to provide information necessary to evaluate permit applications and make decisions, according to criteria established in various Federal wildlife and plant conservation statutes and regulations, on the issuance or denial of permits. The obligation to respond is required to obtain or retain a permit.

(2) *Issuance criteria.* Upon receiving an application completed in accordance with paragraph (a)(1) of this section, the Director will decide whether or not a permit should be issued. In making this decision, the Director shall consider, in addition to the general criteria in § 13.21(b) of this subchapter, the following factors:

(i) Whether the purpose for which the permit is required is adequate to justify removing from the wild or otherwise changing the status of the wildlife sought to be covered by the permit;

(ii) The probable direct and indirect effect which issuing the permit would have on the wild populations of the wildlife sought to be covered by the permit;

(iii) Whether the permit, if issued, would in any way, directly or indirectly, conflict with any known program intended to enhance the survival probabilities of the population from which the wildlife sought to be covered by the permit was or would be removed;

(iv) Whether the purpose for which the permit is required would be likely to reduce the threat of extinction facing the species of wildlife sought to be covered by the permit;

(v) The opinions or views of scientists or other persons or organizations having expertise concerning the wildlife or other matters germane to the application; and

(vi) Whether the expertise, facilities, or other resources available to the applicant appear adequate to successfully accomplish the objectives stated in the application.

(3) *Permit conditions.* In addition to the general conditions set forth in part 13 of this subchapter, every permit issued under this paragraph shall be subject to the special condition that the escape of living wildlife covered by the permit shall be immediately reported to the Service office designated in the permit.

(4) *Duration of permits.* The duration of permits issued under this paragraph shall be designated on the face of the permit.

(b)(1) *Application requirements for permits for incidental taking.* (i) Applications for permits under this paragraph must be submitted to the Director, U.S. Fish and Wildlife Service, Federal Wildlife Permit Office, 1000 N. Glebe Road, Room 611, Arlington, VA 22201, by the person wishing to engage in the activity prohibited by § 17.31.

(ii) The director shall publish notice in the FEDERAL REGISTER of each application for a permit that is made under this section. Each notice shall invite the submission from interested parties, within 30 days after the date of the notice, of written data, views, or arguments with respect to the application.

(iii) Each application must be submitted on an official application (Form 3–200) provided by the Service, and must include as an attachment, all of the following information:

(A) A complete description of the activity sought to be authorized;

(B) The common and scientific names of the species sought to be covered by the permit, as well as the number, age, and sex of such species, if known;

(C) A conservation plan that specifies:

(*1*) The impact that will likely result from such taking;

(*2*) What steps the applicant will take to monitor, minimize, and mitigate such impacts, the funding that will be available to implement such steps, and the procedures to be used to deal with unforeseen circumstances;

(*3*) What alternative actions to such taking the applicant considered and the reasons why such alternatives are not proposed to be utilized; and

(*4*) Such other measures that the Director may require as being necessary or appropriate for purposes of the plan.

(iv) The information collection requirements contained in this paragraph have been approved by the Office of Management and Budget under 44 U.S.C. 3507 and assigned Clearance Number 1018–0022. This information is being collected to provide information necessary to evaluate permit applications and make decisions, according to criteria established in various Federal wildlife and plant conservation statutes and regulations on the issuance or denial of permits. The obligation to respond is required to obtain or retain a permit.

(2) *Issuance criteria.* Upon receiving an application completed in accordance with paragraph (b)(1) of this section, the Director will decide whether or not a permit should be issued. The Director shall consider the general criteria in §13.21(b) of this subchapter and shall issue the permit if he finds that: (i) The taking will be incidental; (ii) the applicant will, to the maximum extent practicable, minimize and mitigate the impacts of such taking; (iii) the applicant will ensure that adequate funding for the conservation plan and procedures to deal with unforeseen circumstances will be provided; (iv) the taking will not appreciably reduce the likelihood of the survival and recovery of the species in the wild; (v) the measures, if any, required under paragraph (b)(1)(iii)(D) will be met; and (vi) he has received such other assurances as he may require that the plan will be implemented. In making his decision, the Director shall also consider the anticipated duration and geographic scope of the applicant's planned activities, including the amount of listed species habitat that is involved and the degree to which listed species and their habitats are affected.

(3) *Permit conditions.* In addition to the general conditions set forth in part 13 of this subchapter, every permit issued under this paragraph shall contain such terms and conditions as the Director deems necessary or appropriate to carry out the purposes of the permit and the conservation plan including, but not limited to, monitoring and reporting requirements deemed necessary for determining whether such terms and conditions are being complied with. The Director shall rely upon existing reporting requirements to the maximum extent practicable.

(4) *Duration of permits.* The duration of permits issued under this paragraph shall be sufficient to provide adequate assurances to the permittee to commit funding necessary for the activities authorized by the permit, including conservation activities and land use restrictions. In determining the duration of a permit, the Director shall consider the duration of the planned activities, as well as the possible positive and negative effects associated with permits of the proposed duration on listed species, including the extent to which the conservation plan will enhance the habitat of listed species and increase the long-term survivability of such species.

[50 FR 39689, Sept. 30, 1985]

§17.40 Special rules—mammals.

(a) [Reserved]

(b) Grizzly bear (*Ursus arctos*)—(1) *Prohibitions.* The following prohibitions apply to the grizzly bear:

(i) *Taking.* (A) Except as provided in paragraphs (b)(1)(i)(B) through (F) of this section, no person shall take any grizzly bear in the 48 conterminous states of the United States.

(B) Grizzly bears may be taken in self-defense or in defense of others, but such taking shall be reported, within 5 days of occurrence, to the Assistant Regional Director, Division of Law Enforcement, U.S. Fish and Wildlife Service, P.O. Box 25486, Denver Federal

Center, Denver, Colorado 80225 (303/236–7540 or FTS 776–7540), if occurring in Montana or Wyoming, or to the Assistant Regional Director, Division of Law Enforcement, U.S. Fish and Wildlife Service, Lloyd 500 Building, Suite 1490, 500 Northeast Multnomah Street, Portland, Oregon 97232 (503/231–6125 or FTS 429–6125), if occurring in Idaho or Washington, and to appropriate State and Indian Reservation Tribal authorities. Grizzly bears or their parts taken in self-defense or in defense of others shall not be possessed, delivered, carried, transported, shipped, exported, received, or sold, except by Federal, State, or Tribal authorities.

(C) *Removal of nuisance bears.* A grizzly bear consituting a demonstrable but non immediate threat to human safety or committing significant depredations to lawfully present livestock, crops, or beehives may be taken, but only if:

(*1*) It has not been reasonably possible to eliminate such threat or depredation by live-capturing and releasing unharmed in a remote area the grizzly bear involved; and

(*2*) The taking is done in a humane manner by authorized Federal, State, or Tribal authorities, and in accordance with current interagency guidelines covering the taking of such nuisance bears; and

(*3*) The taking is reported within 5 days of occurrence to the appropriate Assistant Regional Director, Division of Law Enforcement, U.S. Fish and Wildlife Service, as indicated in paragraph (b)(1)(i)(B) of this section, and to appropriate State and Tribal authorities.

(D) *Federal, State, or Tribal scientific or research activities.* Federal, State, or Tribal authorities may take grizzly bears for scientific or research purposes, but only if such taking does not result in death or permanent injury to the bears involved. Such taking must be reported within 5 days of occurrence to the appropriate Assistant Regional Director, Division of Law Enforcement, U.S. Fish and Wildlife Service, as indicated in paragraph (b)(1)(i)(B) of this section, and to appropriate State and Tribal authorities.

(E) [Reserved]

(F) *National Parks.* The regulations of the National Park Service shall govern all taking of grizzly bears in National Parks.

(ii) *Unlawfully taken grizzly bears.* (A) Except as provided in paragraphs (b)(1)(ii)(B) and (iv) of this section, no person shall possess, deliver, carry, transport, ship, export, receive, or sell any unlawfully taken grizzly bear. Any unlawful taking of a grizzly bear shall be reported within 5 days of occurrence to the appropriate Assistant Regional Director, Division of Law Enforcement, U.S. Fish and Wildlife Service, as indicated in paragraph (b)(1)(i)(B) of this section, and to appropriate State and Tribal authorities.

(B) Authorized Federal, State, or Tribal employees, when acting in the course of their official duties, may, for scientific or research purposes, possess, deliver, carry, transport, ship, export, or receive unlawfully taken grizzly bears.

(iii) *Import or export.* Except as provided in paragraphs (b)(1)(iii) (A) and (B) and (iv) of this section, no person shall import any grizzly bear into the United States.

(A) *Federal, State, or Tribal scientific or research activities.* Federal, State, or Tribal authorities may import grizzly bears into the United States for scientific or research purposes.

(B) *Public zoological institution.* Public zoological institutions (see 50 CFR 10.12) may import grizzly bears into the United States.

(iv) *Commercial transactions.* (A) Except as provided in paragraph (b)(1)(iv)(B) of this section, no person shall, in the course of commercial activity, deliver, receive, carry, transport, or ship in interstate or foreign commerce any grizzly bear.

(B) A public zoological institution (see 50 CFR 10.12) dealing with other public zoological institutions may sell grizzly bears or offer them for sale in interstate or foreign commerce, and may, in the course of commercial activity, deliver, receive, carry, transport, or ship grizzly bears in interstate or foreign commerce.

(v) *Other violations.* No person shall attempt to commit, cause to be committed, or solicit another to commit

FINAL

HABITAT CONSERVATION PLAN

In Support of the Issuance of a Section 10(a) Permit for Incidental Take of the Endangered Delhi Sands Flower-loving Fly in Connection with the Development of Approximately 65 Acres in the City of Rialto, California

Prepared for:

The Edward Antonini Residuary Trust
Angelus Block Company, Inc.
And
E-Z Mix, Inc.

Prepared by:

Michael Brandman Associates
15901 Red Hill Avenue, Suite 200
Tustin, California 92780
(714) 258-8100

Contact: Gregg Miller, Project Manager

July 1, 1999

TABLE OF CONTENTS

Appendices

LIST OF TABLES

LIST OF EXHIBITS

EXECUTIVE SUMMARY

This Habitat Conservation Plan (HCP) is submitted in support of incidental take permit applications for the federally endangered Delhi Sands Flower-loving Fly (*Rhaphiomidas terminatus abdominalis*) (DSF) in connection with development of approximately 65 acres for industrial and other uses in Rialto, California (Proposed Action). The Site is owned by the Edward Antonini Residuary Trust. The DSF is termed the "Covered Species" because it is the species for which incidental take is to be authorized pursuant to the Proposed Action. The Permit Applicants are: the Edward Antonini Residuary Trust, Angelus Block Company, Inc., and E-Z Mix, Inc.

The Applicant's Proposed Action consists of (1) the development or sale of up to approximately 65 acres (herein after Development Area or Developable Permit Area) of the 96-acre Project Site for industrial, commercial, or other development and the operation of such facilities over a 30-year period, and (2) the implementation of an HCP which establishes an approximately 30.5-acre conservation area (Conservation Area) in the northern portion of the Project Site (including a 5-acre mitigation bank) for conservation of the DSF and perhaps other species.

The Conservation Area would be dedicated in fee title to a wildlife conservation organization at no cost, to be used for the recovery and conservation of the DSF. An endowment fund would be established to provide funds for annual maintenance, adaptive management, and to respond to changed circumstances in the Conservation Area in perpetuity. Five acres of mitigation credits within the Conservation Area will be available for purchase to mitigate for either direct impacts to DSF resulting in take of DSF, or for impacts to DSF habitat, on other properties. Proceeds from the sale of mitigation credits would be used to help defray the Applicants costs in establishing the Conservation Area and endowment fund.

It may be possible to assemble and/or restore approximately 62 acres of contiguous potentially restorable habitat for conservation of the DSF by connecting the approximately 30.5-acre Project Site Conservation Area with other off-site adjacent and nearby habitat which may be dedicated for DSF conservation.

A long-term conservation benefit to the DSF is expected from the Proposed Action. With respect to the DSF, no DSF were observed on the Project Site during three consecutive years of surveys (1995, 1996, and 1997). During 1998 surveys there were 4 observations of DSF on a single day within the proposed Conservation Area. In the view of the Applicants the Delhi Sands soils and the habitat they support that occur on the Site are generally degraded, with small patches of vegetation of a composition and density associated with potential use by DSF in the northern and central portion of the site. These small patches are interspersed within approximately 30 acres of habitat generally unsuitable for DSF. It could be argued that the data from the 1998 surveys indicate that a small (approximately one acre) portion of the Site within the Conservation Area appears occupied by DSF. Thus, it is possible that the removal of approximately 43 acres of potentially restorable habitat containing Delhi Sands soils as called for in the Proposed Action could result in the take of a small but unknown number of DSF under the ESA over the course of the next thirty years. Although development of the Project Site may result in the take of a small but unknown number of DSF under the ESA, for purposes of this HCP and Section 10(a) permit application, the level of take is defined as the loss of any and all DSF that are taken incidentally during activities associated with the Proposed Action across the 96 acre Project Site.

SECTION 1
INTRODUCTION

The Edward Antonini Residuary Trust ("Antonini Trust") owns approximately 96 contiguous acres in the City of Rialto, County of San Bernardino, California ("Project Site" or "Site") (Exhibit 1). The Site is zoned for heavy industrial use. The Site is located in Section 36, Township 1 south, Range 5 west of the U.S. Geological Service (USGS) "San Bernardino South" 7.5 minute quadrangle. The Site is located south of Interstate 10 in the City of Rialto ("City") and is bounded to the west by Riverside Avenue and Industrial Drive, the southeast by Agua Mansa Road and the south by the intersection of Riverside Avenue and Agua Mansa Road (Exhibit 2). The northern boundary of a Southern California Edison ("SCE") easement forms the north/northeastern boundary of the Site. This easement lies within the Site, and the underlying fee interest is owned by the Antonini Trust (Exhibit 3).

The Site consists of two adjoining parcels (Exhibit 3). The Site was purchased in 1989 by the Antonini Trust. A parcel map was approved by the City for the larger of the two parcels (approximately 87.5 acres in size) on the Site in 1991. The final parcel map was approved by the City on March 17, 1998. This larger parcel is currently subdivided into 22 lots for heavy industrial use. The second parcel lies to the immediate east of the first, and is approximately 8.4 acres in size. Two access streets would traverse portions of the larger parcel, entering from the western boundary along Industrial Drive or Riverside Avenue and terminating approximately midway across the larger parcel in cul-de-sacs. Approximately 21 acres of the Site along the entire northeastern boundary are subject to a public utility easement for electrical transmission purposes granted to SCE.

The Site lies within the Agua Mansa Enterprise Zone ("AMEZ"), an approximately 9,000-acre area within portions of the cities of Colton, Rialto, and Riverside and the counties of Riverside and San Bernardino. These five jurisdictions have executed a Joint Powers Agreement establishing the Agua Mansa Industrial Growth Association ("AMIGA"). The AMEZ seeks to encourage industrial development of this area through various tax and other economic incentives. There are approximately 4,000 acres of vacant land remaining in the AMEZ.

The Antonini Trust is preparing to proceed with the development of the larger parcel for industrial uses. Lots 11, 12, 13, 14 and 15 are currently anticipated to be used for a sacking plant and facility for concrete, preblended mortar, asphalt and associated materials. This facility, known as the E-Z Mix East Complex, would be operated by Angelus Block Company, Inc. ("Angelus Block"). Lots 4, 5, 6, 7, 8, 9, and 10 are intended for use by Angelus Block for a paver production plant. A portion of Lot 1 is intended for use as a concrete block plant. The other lots are expected to be sold to other industrial users for development.

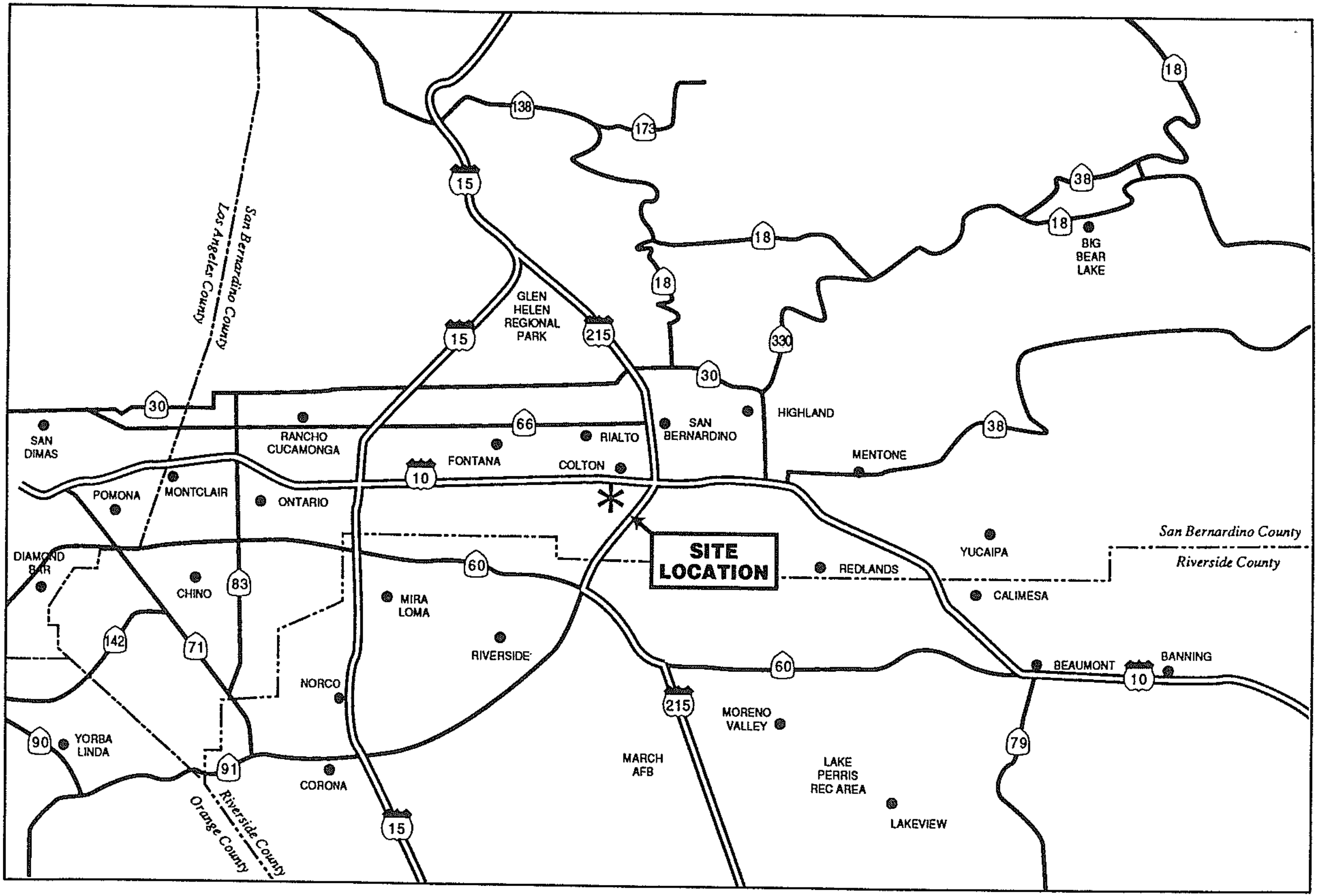
In 1990 and 1992, SCE executed agreements with Angelus Block, acknowledging that Angelus Block could conduct grading operations and store concrete block and related product and equipment and items within the area subject to SCE's nonexclusive easement for electrical transmission purposes without interfering with SCE's rights pursuant to its easement. Angelus Block's manufacturing facilities and the parcel map for the Site have been designed to utilize the areas within the SCE easement for Angelus Block's operational needs. Concrete block, related product and equipment storage would occur on either side of a 16-foot wide road bisecting the length of the SCE easement area. The road would be used to access the three SCE transmission towers and the material stored in this area.

The Site has obtained the necessary local government entitlements for development and use for industrial purposes. Additional grading, building pad construction, interior road extensions, associated utilities installation, and storm drain system construction must still be conducted. Given the amount of land set-asides proposed in the HCP, it is estimated that less than 10 industrial users could ultimately be located on the Site.

Subsequent to the City's approval of the parcel map in 1991, the USFWS listed the DSF as endangered under the ESA. A final rule listing the DSF as "endangered" under ESA was published by the USFWS in the Federal Register on September 23, 1993 (USFWS 1993). The DSF is not a listed species under the California Endangered Species Act ("CESA"). In fact, CESA does not permit the listing of insects under the statute. The site is located within the 40-square mile area of the believed historic range of the DSF. Delhi Sands soils are present on most of the Site (USDA 1980), as depicted in Exhibit 4; more detailed soil surveys of the Site have not been done. Approximately 67 acres of the 87.5-acre parcel contain Delhi Sands soils and are thus potentially restorable as DSF habitat.

Angelus Block engaged Michael Brandman Associates (MBA) to conduct focused surveys in 1995, 1996, 1997 and 1998 for the DSF on the entire 96-acre Project Site according to then-applicable USFWS survey protocol during the species' single annual flight period (August - September), since the Project Site was located within the believed historic range of the species. The 1998 surveys were conducted according to protocols pre-approved by USFWS (see Section 3).

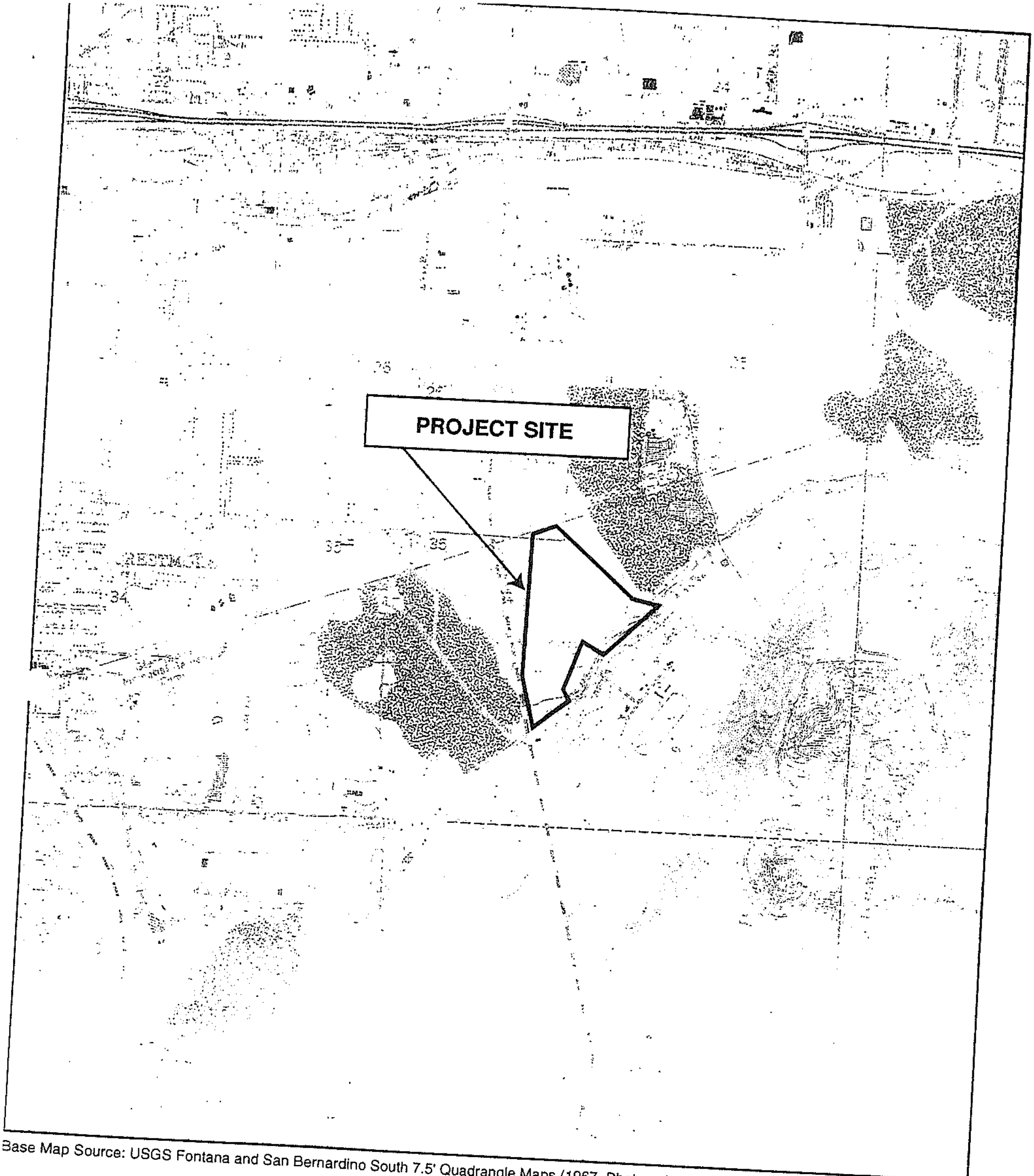
The Project Site's vegetation is dominated by ruderal (weedy) species which have re-colonized the site since the Site was disced for fuel reduction in April 1997. Most of the Site is dominated by the native annual bur-sage and the non-native Russian thistle (*Salsola tragus*) and mustard (*Hirshfeldia incana*). Other generally distributed common species are the non-native grasses, wild oats (*Avena fatua*), ripgut brome (*Bromus diandrus)*, and foxtail chess (*Bromus madritensis ssp. rubens*). In the small eroded washes and a few other small patches, a few additional native species are prevalent, including California croton (*Croton californicum)*, tarweed (*Hemizonia fasciculata*), and fiddleneck, (*Amsinckia intermedia*). The native telegraph weed (*Heterotheca grandiflora*) is common in places. In a few sparsely vegetated sandy unpaved roadways and in small patches of relatively open sand distributed occasionally to frequently within the



Michael Brandman Associates
NORTH
20620002 • 4/98

Exhibit 1
Site Vicinity Map

ANTONINI TRUST / ANGELUS BLOCK • DELHI SANDS FLOWER-LOVING FLY HCP/EA



Base Map Source: USGS Fontana and San Bernardino South 7.5' Quadrangle Maps (1967, Photorevised 1980).

NORTH

2000 1000 0 2000

SCALE IN FEET

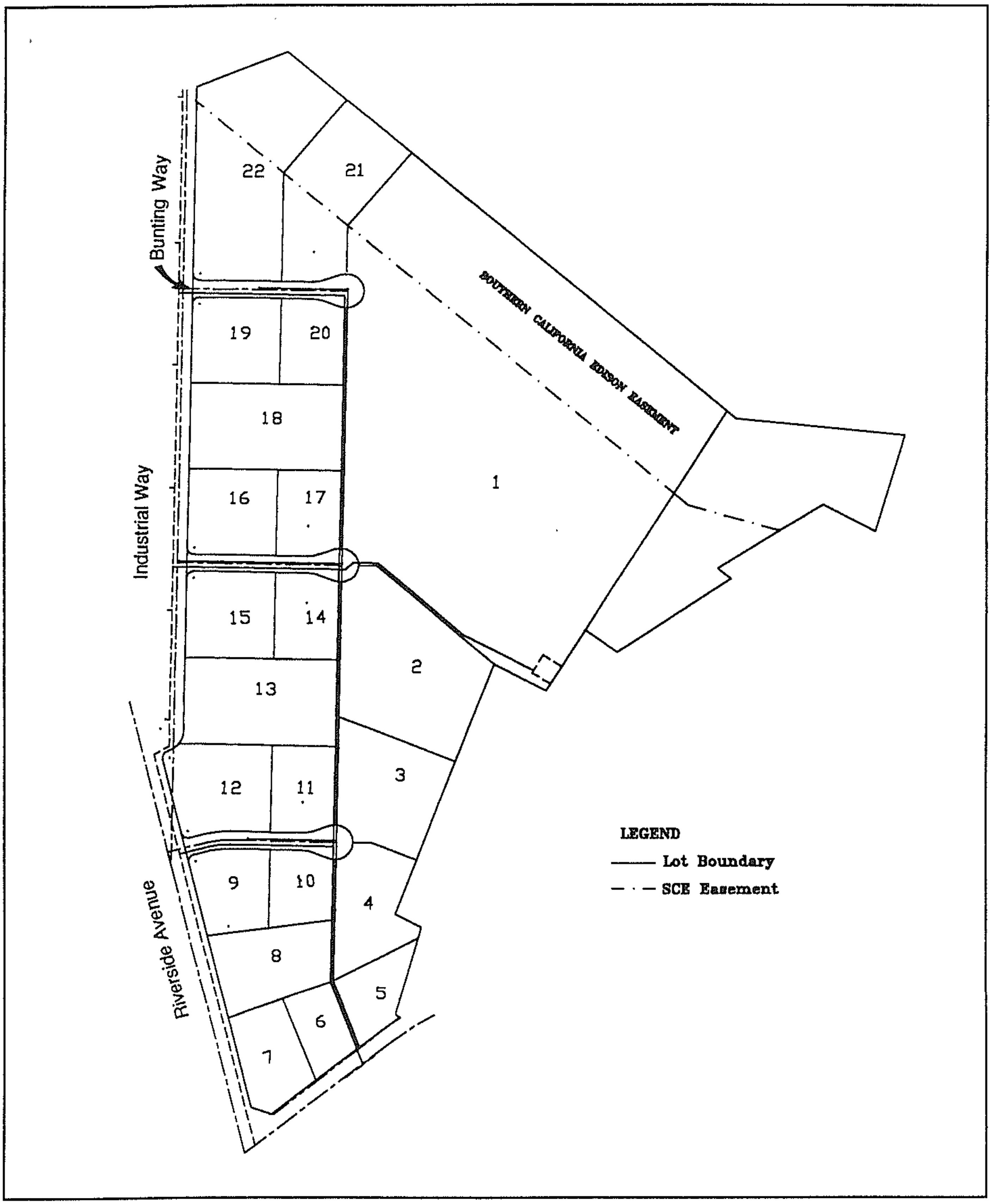
Mic[illegible]randman Associates

20620002 • 2/98

Exhibit 2

Site Location Map

ANTONINI TRUST / ANGELUS BLOCK • DELHI SANDS FLOWER-LOVING FLY HCP/EA



Michael Brandman Associates

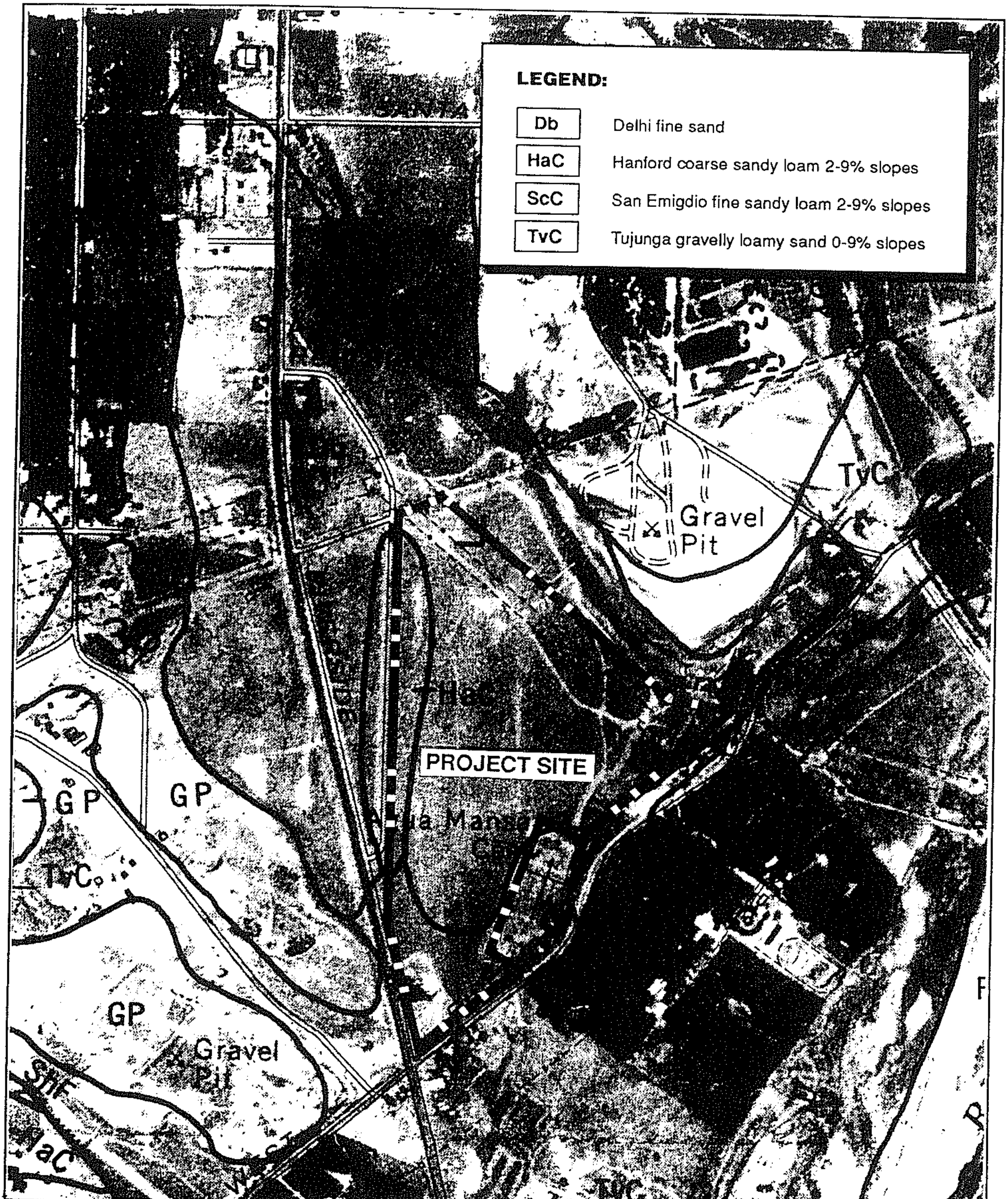
NORTH

Exhibit 3

Site Plan

20620002 • 5/98

ANTONINI TRUST / ANGELUS BLOCK • DELHI SANDS FLOWER-LOVING FLY HCP/EA



Michael Brandman Associates

Exhibit 4

Project Site and Vicinity Soils

20620002 • 4/98

ANTONINI TRUST / ANGELUS BLOCK • DELHI SANDS FLOWER-LOVING FLY HCP/EA

otherwise typically dense vegetation cover, a few additional native species are prevalent, including California croton, tarweed, and fiddleneck. Vegetation of this particular character is largely found dispersed across a 20- to 30-acre area in the northwestern portion of the Project Site that contains the proposed Conservation Area. Castorbean (*Ricinis communis*) and annual sunflower (*Helianthus annuus*) are common in the drainage ditch bordering Agua Mansa Road. The slope along the upper one-half of the Site's southeastern border is covered with a dense growth of non-native grasses, among which occur sparsely most of the other plant species mentioned above, as well as brittlebush (*Encelia farinosa*), valley cholla (*Opuntia parryi*), calabazilla (*Cucurbita foetidissima*), wild cucumber (*Marah macrocarpus*), jimson weed (*Datura wrightii*), and a few individuals of California buckwheat (*Eriogonum fasciculatum*).

Of the relatively low total of 41 species of plants detected on the Project Site, 19 are non-native, and seven of the remaining 22 natives are weedy in nature. Vegetation cover on the Site varies from 100 percent to less than 5 percent; most of the Site supports cover exceeding 90 percent. Overall, the herbaceous/grass layer averages about 80 percent cover. Adult DSF do not appear to use areas of dense cover where annual grasses or native buckwheat exceed 50% cover (USFWS 1997). Sparse vegetation (less than 50% cover) and sandy substrates are the primary habitat requirements of flies in the genus *Rhaphiomidas* (USFWS 1997). Vegetation cover in the 10- 20 percent range appears to be optimal cover for *Rhaphiomidas* flies (USFWS 1997). (In the view of the Applicants, most of the Project Site is considered to provide generally unsuitable habitat for the DSF particularly the portions of the Site that do not include the proposed Conservation Area.)

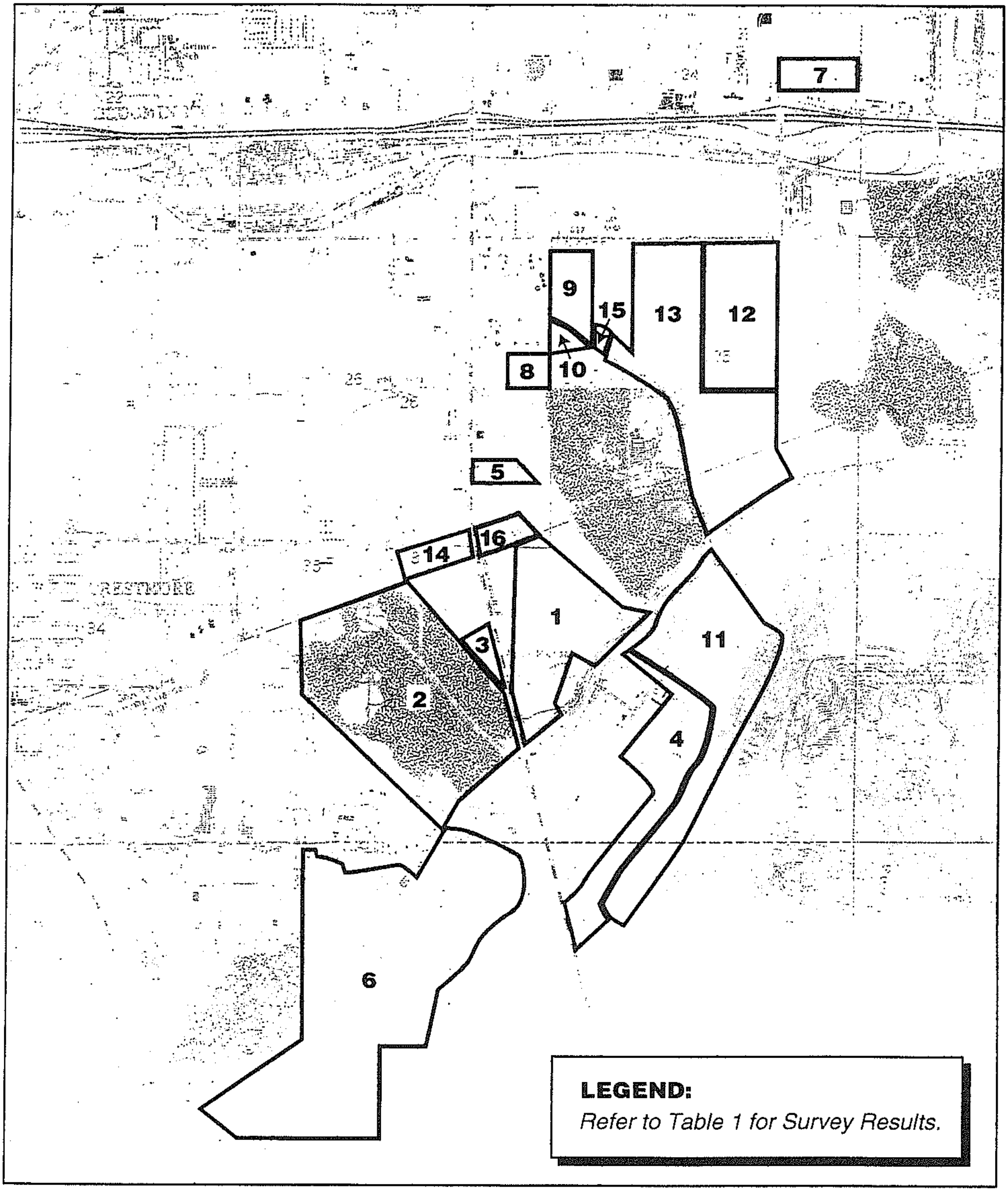
Prior to 1998, three consecutive years (1995-97) of DSF surveys were completed for the Site in accordance with the field methods called for in the USFWS recommended survey protocol (although surveys in 1996 did not begin until the third week of that year's flight season). Over 216 hours of surveys were conducted during appropriate survey periods and under weather conditions suitable for observation of DSF by trained biologists with experience with DSF. Appendices A, B and C contain copies of the survey reports. During the 1995-97 surveys no DSF were detected on the Site. The 1995-97 survey data indicated that the Site was not occupied by DSF, nor was the Site used for feeding, sheltering, breeding, or other behavioral patterns essential to the species, although several sightings of the DSF have been made on other properties in the vicinity of the Project Site (see Exhibit 5). The data on the Site's habitat conditions and the known habitat associations of DSF supported the 1995-97 survey results. Details of MBA's 1995, 1996 and 1997 surveys are discussed at greater length in Section 3.

The Applicants began preparing an HCP for the property in 1997, after three years of surveys showed no DSF on the Site. Although the three years of data indicated that the Project Site was not occupied, the Applicants still desired to obtain a Section 10(a) Permit in order to facilitate a more orderly and certain development schedule regarding future development of the Site. Complete build-out of the site is expected to occur over a period of years. Given the mobile nature of the species, the observations of the species on certain properties in the vicinity of the site and the potential for changing biological conditions on surrounding properties and the project site over a period of years, such certainty was desired for proper land use planning and investment.

After the initial HCP was prepared and at the request of USFWS, additional focused surveys were conducted in 1998. Forty hours of surveys were conducted in 1998 on the Site during appropriate survey periods and under weather conditions suitable for observation of DSF by MBA. During the 1998 surveys there were 4 DSF observations on a single day of the surveys. No DSF were observed mating, ovipositing, or feeding. The nature of the four observations indicate that most likely 3 individual DSF were present: 2 males and 1 female. The observations all occurred in a localized area of the Site within the proposed Conservation Area (Exhibit 6), in an area which had recently been disturbed between June 1996 and February 1997 for the construction of an underground water pipeline). Details of the 1998 surveys are discussed at greater length in Section 3. (Appendix D contains a copy of the 1998 survey report). Thus, it could be argued that development of the Project Site may result in the take of a small but unknown number of DSF under the ESA.

The USFWS Habitat Conservation Planning Handbook provides that the level of incidental take authorized by a Permit can be expressed either in terms of individual members of the species to be taken, or in terms of habitat acres in cases where the number of individuals is unknown or indeterminable. Using the number of habitat acres is appropriate for these Permit Applications because it is not possible to determine the number of DSF individuals which may be taken over the life of the permit. It is not possible to determine the number of DSF that may be taken because: (1) DSF spend the majority of their lives beneath the soil and there are no reliable methods to determine subsurface numbers that would not harm or injure DSF; (2) DSF have been detected on only one day during the most recent of four years of surveys of the Site conducted during the adult flight season, making judgements about ongoing presence or occupation of the Site by DSF problematic; and (3) relatively little is known generally about DSF biology. The Proposed Action will result in the loss of approximately 43 acres of Delhi Sands soil, which is the fundamental component of DSF habitat. The vast majority of this acreage (more than 90 to 95%) however is unsuitable for the DSF. The Applicants request the take to be authorized by the present Permits be stated as any and all DSF that are taken incidentally within the meaning of the ESA as a result of activities associated with the Proposed Action as described in Section 2 of this HCP on the 96 acres of the Site.

Although the three above-described facilities are planned for portions of the Site, this HCP is designed to accommodate any type of industrial, commercial, or other development and operation by any entity within the portion of the Site to be permitted for incidental take, namely the 15 lots and the 8.4-acre parcel in the eastern portion of the Site identified in Exhibit 7. Although E-Z Mix, Inc. is currently contemplating using Lots 11-15 for its sacking plant facility (also known as the "E-Z Mix East Complex") and Angelus Block is contemplating the use of a portion of Lot 1 for its concrete block plant and Lots 4-10 for its paver plant, this HCP is designed to allow for alternative industrial uses of these lots as well. As will be described in Section 5 of this HCP, the paver plant has been redesigned twice in the course of the biological analysis of the HCP



Base Map Source: USGS Fontana and San Bernardino South 7.5' Quadrangle Maps (1967, Photorevised 1980).

Michael Brandman Associates

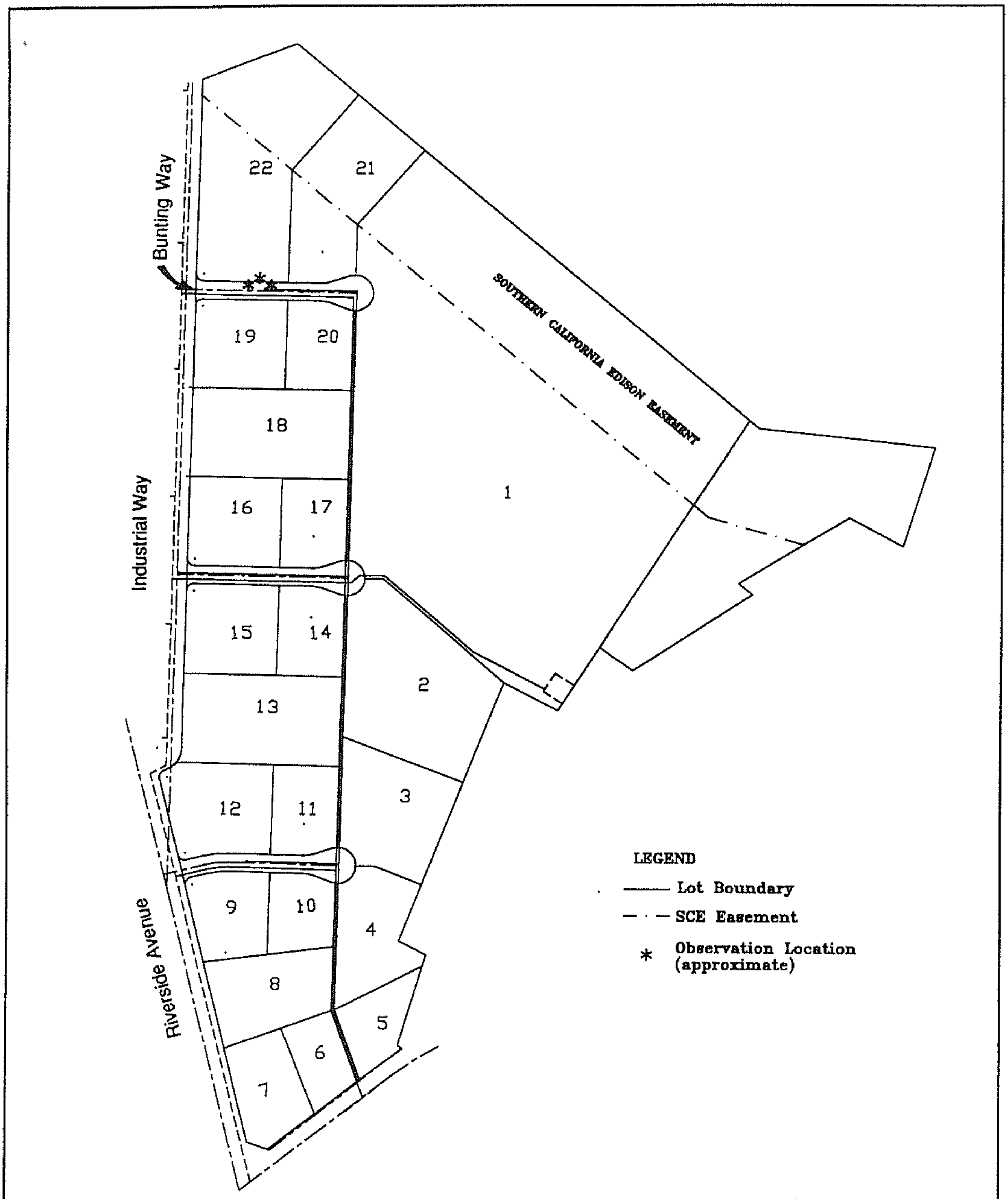
NORTH

2000 1000 0 2000

SCALE IN FEET

Exhibit 5

Delhi Sands Flower-Loving Fly Survey Sites



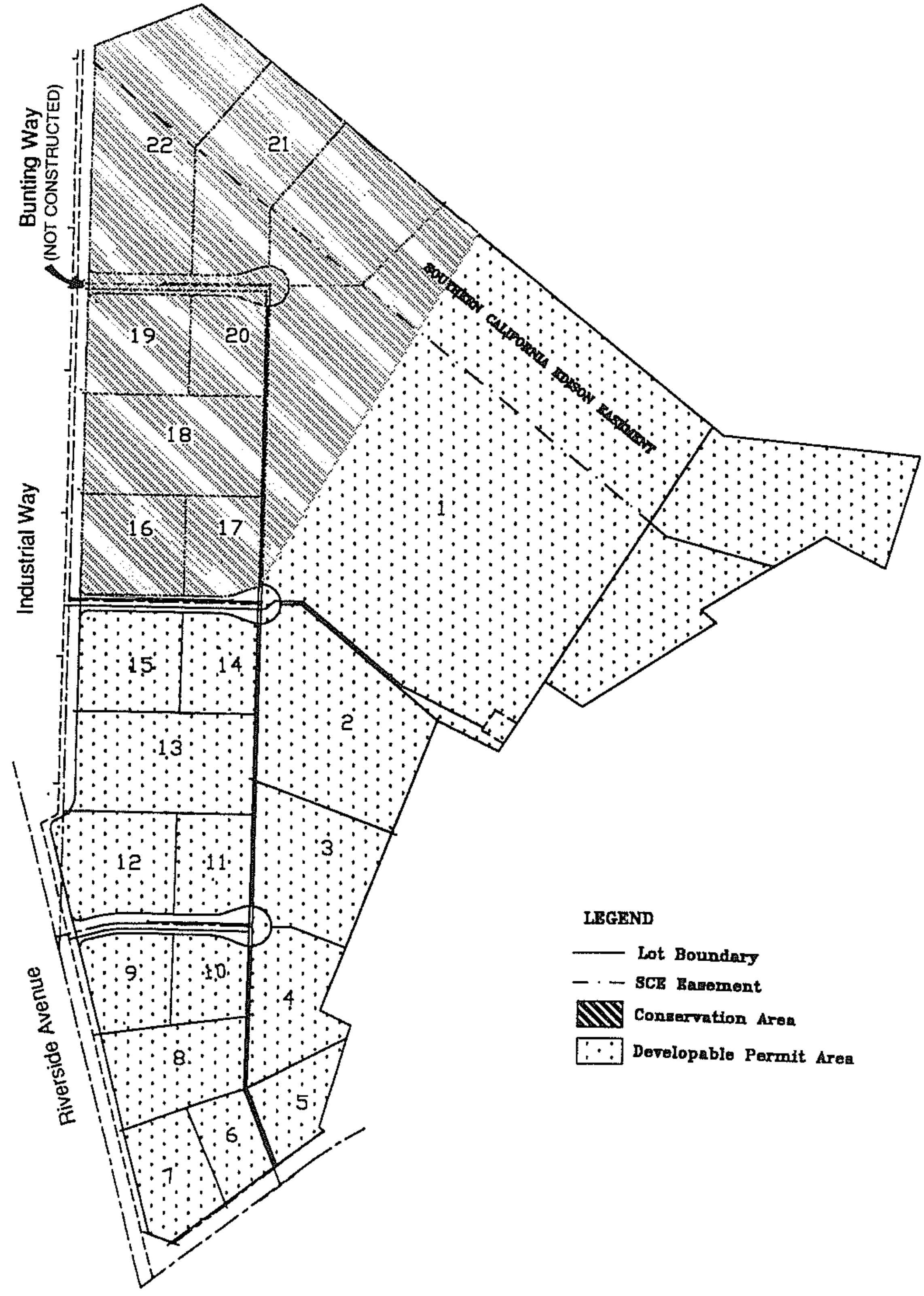
Michael Brandman Associates NORTH

Exhibit 6

Delhi Sands Flower-loving Fly 1998 Observations

20620002 • 11/98

ANTONINI TRUST / ANGELUS BLOCK • DELHI SANDS FLOWER-LOVING FLY HCP/EA



Note: Entire Project Site is to be covered by Incidental Take Authorization.

Michael Brandman Associates

Exhibit 7

Proposed Conservation Area

20620002 • 7/99

ANTONINI TRUST / ANGELUS BLOCK • DELHI SANDS FLOWER-LOVING FLY HCP/EA

to be located on Lots 4-10, as opposed to its originally designed location on Lots 21 and 22 and subsequently redesigned location on Lots 16-20.

As noted previously, the Applicants initiated this HCP even though three years of focused survey indicated that the DSF was absent for the site. The USFWS final Recovery Plan for the DSF promotes the adoption of voluntary conservation efforts by private landowners for the DSF. The Applicants recognized that land management activities and land use decisions by private landowners can assist in the recovery of the DSF if specifically designed for that purpose. Alternatively, some land management practices or land use decisions would not promote such recovery and can even be detrimental to recovery efforts. A major purpose of this HCP is to promote and ensure land management practices and land-use decisions which will benefit the DSF. The conservation of land in the HCP will benefit the DSF.

As noted above, portions of the Site may be sold to other industrial users. Moreover, full build-out may not be realized for many years. Thus, another major purpose of this HCP is to provide certainty to the development of a portion of the Site with respect to the potential for any future ESA constraints relative to the DSF.

The Section 10(a) permits will provide certainty that future development of various parcels on the Project Site will not result in a violation of Section 9 of the ESA. Such certainty is important to enable future development decision-making and financial commitments to proceed in an orderly fashion. In return for such assurances, the Permit Applicants would establish an approximately 30.5-acre conservation area for the DSF in the northern portion of the Project Site (the "Conservation Area"). The Applicants would also provide an endowment fund that would provide funds for annual maintenance, adaptive management, and to respond to changed circumstances in the Conservation Area in perpetuity. The Conservation Area is depicted in Exhibit 7. By ensuring for the conservation of a portion of the Project Site in perpetuity and by providing for this enhancement and expansion of DSF populations, the Applicants seek assurance that additional regulatory burdens will not be imposed upon them beyond these measures expressly provided for in the HCP. As set forth in the Implementing Agreement (IA), the permits will provide that landowners within the Project Site will be covered for DSF take resulting as an artifact of increased use of the Conservation Area through the implementation of this HCP. The Conservation Area would be enhanced and dedicated in fee title to a wildlife conservation organization or agency at no cost, to be used for the recovery and future conservation of the DSF. The IA also provides for the ability of the Applicants or their assigns to further enhance or use the Conservation Area for the benefit of other future listed species provided that: (1) USFWS approves such enhancement or use of the Conservation Area, and (2) such actions would not be expected to decrease the value of the Conservation Area for the DSF. If the USFWS determines in writing that such proposed enhancement would negatively impact the DSF, the USFWS may preclude such enhancement by the Permittees. Also, a 5-acre mitigation bank will be established as part of the approximately 30.5-acre Conservation Area.

Should DSF be drawn to or become established in the Conservation Area, the Applicants will be covered for any incidental take of any such DSF which may occur from development within the permit area or operations on the Site as the result of conservation efforts undertaken by the Applicants.

This HCP is designed to provide a net benefit to the DSF in perpetuity by preserving approximately 30.5 acres of potentially restorable habitat for the conservation of the DSF (containing some currently potentially suitable habitat for the DSF) and providing funds for maintenance of the Conservation Area. An endowment fund would be established to provide funds for annual maintenance, adaptive management, and to respond to changed circumstances in the Conservation Area in perpetuity. Currently, there is no protected habitat for the DSF on the Site. The proposed Conservation Area is immediately adjacent to other potentially restorable DSF habitat off-site that is being considered as a permanent conservation area for the DSF. The location of the Conservation Area on the Site has been selected to be contiguous with adjacent habitat which is being considered for dedication for DSF conservation. Assembling an approximately 62-acre contiguous DSF reserve may be possible by connecting the approximately 30.5-acre Project Site Conservation Area with adjacent off-site and nearby areas being considered for dedication for DSF conservation. This is more fully discussed in Section 3 of this HCP.

The HCP and Section 10(a) permits provide a means of achieving finality and certainty, allowing development of the Site to proceed without further concern regarding potential impact to DSF on the Site. The HCP and Section 10(a) permits will enable the Permit Applicants to set aside and conserve a portion of the Site to promote the recovery and conservation of the DSF.

SECTION 2
PURPOSE AND NEED FOR ACTION

The Permit Applicants have applied to the USFWS for Section 10(a)(1)(B) incidental take permits (Permits). The Permits would authorize incidental take of the DSF in the course of otherwise lawful activities associated with construction and operation of a variety of facilities on approximately 65 acres of the Site as well as management of a 30.5-acre Conservation Area. This HCP is intended to meet and exceed the requirements for issuance of permits under Section 10(a)(1)(B) of ESA for "take" of DSF that may occur during the course of development of and operations on the Project Site and other activities associated with the Proposed Action over time. Such incidental take authorization is desired by the Permit Applicants in order to provide sufficient certainty for future development and respond to the possibility that some incidental take could occur on the Site in connection with development, the Applicants' own conservation efforts, or through changes to the biological conditions of the surrounding property and/or Project Site.

The Applicants are committing to promote the long-term conservation of the DSF by dedicating fee title to approximately 30.5 acres that would be used for recovery and conservation of the DSF in the northern portion of the Site and providing an endowment fund for enhancement, annual maintenance, biological monitoring, reporting, adaptive management, and to respond to changed circumstances in the Conservation Area in perpetuity. The Conservation Area will be restricted through legal instrument, such as a Declaration of Restrictions, to require that the area be used for conservation purposes. As described more fully in Section 4 of this HCP, the Applicants will fence the Conservation Area and construct a sand retention fence along its southern boundary. The Conservation Area may be able to be combined with other property in the area for the conservation of the DSF. The Permits would also result in a significant contribution to the recovery and long-term conservation of the DSF by establishing in perpetuity an approximately 30.5 acre conservation area containing small scattered patches of suitable DSF habitat within a matrix of dense non-native vegetation (which habitat can be enhanced for the DSF) in an area that is geographically well positioned to be used for such purpose. The HCP is expected to provide a long-term net benefit to the DSF, especially considering the expected low level of effects on the DSF from the Proposed Action. The Applicants consider implementation of this HCP in connection with the Permits to be an effective means to promote the conservation needs of the DSF while serving the need for landowner certainty.

The needs and goals of the USFWS are to: (1) recover listed species, (2) ensure compliance with ESA, the National Environmental Policy Act (NEPA), and other applicable federal laws and regulations, and (3) obtain a voluntary and effective contribution towards securing the long-term viability of the DSF.

The actual number of DSF that might be taken as a result of the Proposed Action--although small, if any, is impossible to know with certainty. Approximately 43 acres of currently unoccupied but potentially restorable DSF habitat would be lost as a result of the Proposed Action. Although no DSF were observed during three consecutive years (1995-97) of focused DSF surveys, there were four (4) DSF observations on a single day during additional focused surveys conducted in 1998. The four (4) observations appear to represent three (3) DSF.

PROPOSED ACTION

The Permit Applicants propose to develop or sell approximately 57 acres of the larger parcel of the Site for industrial or other uses. An approximately 30.5-acre Conservation Area in the northern portion of the Site would be transferred in fee title to a conservation or wildlife organization or agency at no cost, to be used to promote the conservation of the DSF (see Exhibit 7). Concurrent with the issuance of the Section 10(a) Permits and prior to any ground disturbance on Lots 1, 2, or 3, the Conservation Area will be restricted in perpetuity by a legal instrument such as a recorded Declaration of Restrictions or similar mechanism, and the Applicants will provide an endowment fund, the annual proceeds of which will be used for ongoing maintenance, adaptive management, enhancement, monitoring, reporting, and to respond to changed circumstances in the Conservation Area. The Applicants would also construct a chain link fence around the Conservation Area to prevent unauthorized access, construct a solid fence along the southern boundary of the Conservation Area to prevent soil loss, and perform initial weed and trash removal to increase the suitability of the Conservation Area for the DSF. In consultation with the USFWS, Permittees shall conduct initial weed and trash removal, where appropriate, throughout the Conservation Area within six months of the effective date. Provided that field experience on the Project Site demonstrates it is practicable, such chain link fencing will also use silting screens along lower portions of the fence to assist with Delhi series sand retention within the Conservation Area. The Conservation Area will be posted with signs indicating that the area is environmentally sensitive and that trespassing is prohibited. The smaller 8.4-acre parcel is not currently planned for development.

As described and detailed more fully in the Implementing Agreement, a five (5) acre conservation bank will be established within the approximately 30.5 acre Conservation Area concurrent with, and as part of, the USFWS's approval of the HCP and the placement of a deed restriction on the Conservation Area for DSF conservation purposes. Antonini Trust will be able to sell conservation credits to other persons, companies, organizations, etc., ("Credit Purchasers") to satisfy, in whole or part as evaluated by the USFWS, their off-site mitigation needs associated with land disturbance activity within the Colton Recovery Unit. (The Colton Recovery Unit is identified in the USFWS's 1997 Final Recovery Plan for the DSF.) The Conservation Bank will have a total of five (5) acres of conservation credits to sell, and these credits may be sold and transferred in one-tenth (0.10) acre increments, or multiples thereof. The purchase of mitigation credits from the bank will not, of itself, authorize Incidental Take for projects purchasing mitigation credits. Those projects may require independent Incidental Take authorization. The USFWS would determine whether offsite mitigation is acceptable for any particular project within the Colton Recovery Unit and identify the amount of offsite mitigation required by such Credit Purchasers for their activities. Antonini Trust will be responsible for monitoring the remaining credits available and for maintaining an accounting of the amount, date, etc., of the credits sold and will update the USFWS with this information as required in the Implementing Agreement. Where the USFWS determines that off-site mitigation is appropriate on properties within the Colton DSF Recovery Unit, the conservation credits will be available for purchase to mitigate for either direct impacts to DSF resulting in take of DSF, or for impacts to DSF habitat, on properties within the Colton DSF Recovery Unit.

Two paved streets would be installed on portions of the western half of the Site, extending east from Riverside Avenue or Industrial Drive as shown in Exhibit 3. Curbs and gutters also would be installed. The Developable Permit Area of the Project Site would be graded, and construction and operation of industrial or other facilities would subsequently occur on those lots. Lot sizes are set at a minimum of 48,996 square feet and range to a maximum of 33.4 acres prior to implementation of the HCP. Utilities (electricity, sewer, water and the like) would be installed. All utilities are expected to be installed underground. Water lines already exist under a portion of the proposed Conservation Area. All required drainage facilities would be constructed outside the Conservation Area. The land within the SCE easement but outside the Conservation Area would be used for outdoor product storage. Materials to be stored outdoors are finished concrete block and concrete paver. No portion of the SCE easement within the Conservation Area would be used for storage. A network of access roads would be placed in the storage area, and the storage area may be graded. The only portion of the Site off limits to grading would be the Conservation Area.

Approximately 8.9 acres of the Conservation Area are currently subject to a non-exclusive easement in favor of SCE for solely electrical transmission purposes and would continue to remain so. SCE currently uses this area for such purpose. Limited portions of this 8.9-acre area would continue to be disturbed by SCE during maintenance activities; generally, disturbance can be expected to be confined to movement of equipment and persons on the existing dirt roadway. The existing dirt roadway used by SCE in this area would continue to be available and used by SCE. The roadway is used by SCE vehicles to access transmission towers that are outside of and to the west of the proposed Conservation Area. The dirt roadway is approximately 16 feet wide. Approximately every 6 weeks SCE washes the insulators on the transmission towers using pressurized water. The washing occurs outside the Conservation Area. SCE will not receive authorization for incidental take of DSF within the Conservation Area or the Permit Area by virtue of the Applicants Section 10(a) permits. Thus, SCE would continue to remain precluded from taking any action in the Conservation Area that would result in incidental take of any DSF in the absence of its own independent incidental take authorization from the USFWS.

The Permit Applicants seek incidental take authority for a period of thirty (30) years for the DSF. The number of DSF's that may be killed, harmed or harassed by the Proposed Action is impossible to quantify with precision. On the basis of current data and Site conditions, that number is expected to be low. Over time, some DSF may be impacted by development or operation of any of the facilities on the Site. In any event, the number impacted is expected to be far less than the number of new DSF produced and/or protected by virtue of the DSF's ultimate use of the Conservation Area, dedicated, enhanced and maintained by the Proposed Action. It could be argued that the biological data from 1998 surveys indicate that a small portion of the Project Site appears occupied by DSF. For purposes of the HCP and Section 10(a) Permit applications, it is assumed that a relatively small number of DSF may be incidentally taken by virtue of the development of a 65 acre Developable Permit Area and the management of the approximately 30.5-acre Conservation Area for species conservation purposes.

The time of full build-out of the Site is not known. Full build-out could take longer than 20 years depending upon economic and market conditions, which cannot be precisely predicted. The Conservation Area and the endowment fund will be established and set aside in perpetuity. The nature of the endowment fund and HCP allow for adaptive management of the Conservation Area to respond to changing conditions associated with the DSF, the Conservation Area, or the surrounding properties. For these reasons, a 30-year duration for the Permit is considered reasonable.

The Project Site is zoned for heavy industrial use. Within the City of Rialto zoning ordinances, heavy industrial uses include but are not limited to manufacturing, assembling, testing or processing of vehicles, batteries, candles, carpets, concrete products, glass, ink, motors, plastics, and steel products. A complete list of the potential uses of the lots within the Permit Area is contained in Appendix G. Any of these operations may occur within the lots within the Permit Area.

This HCP provides that the Permit Applicants would mitigate for any incidental take of DSF resulting from the Proposed Action, including the enhancement of the Conservation Area, through the conveyance of fee title to approximately 30.5 acres in the northern portion of the Site to a conservation or wildlife organization or agency acceptable to the USFWS for purposes of promoting the recovery and conservation of the DSF. Additionally the Applicants would establish an endowment fund to provide for enhancement and annual maintenance, adaptive management and to respond to changed circumstances in the Conservation Area in perpetuity for the benefit of the DSF. This protected land would complement other lands in the immediate area, which are being considered by others for protection as DSF habitat. As noted, it may be possible to assemble approximately 62 acres of contiguous habitat for DSF conservation by connecting the approximately 30.5-acre Project Site Conservation Area with adjacent and nearby potentially restorable habitat which may be dedicated for DSF conservation. Implementation of a DSF habitat restoration plan for the SCE parcels north and west of the Project Site is expected to begin in the near future. The parcels are approximately 19 acres in size and are contiguous with the proposed Conservation Area. This would result in approximately 50 acres of protected habitat for the DSF. Additionally the Owl Company has agreed to set aside 6+ acres of an 11-acre site along Riverside Avenue as dedicated land for DSF conservation. This would result in approximately 56 acres of land conserved for DSF.

MIGRATORY BIRD TREATY ACT

The Applicants recognize that the Section 10(a) Permits, should they be issued by the Service, do not relieve the Applicants from assuring compliance with thee Migratory Bird Treaty Act ("MBTA"). The Applicants will conduct grading or clearing activities within the Permit Area in compliance with the requirements of the MBTA.

SECTION 3
POTENTIAL IMPACT OF THE PROJECT ON THE DSF

ECOSYSTEM DESCRIPTION

The most consistent and characteristic feature of all known sites occupied by the DSF is the presence of fine, sandy soils, often with wholly or partly consolidated sand dunes. These soil types are generally classified as the Delhi series (primarily Delhi fine sand). Delhi series soils cover approximately 40 square miles in several irregular patches extending from the cities of Colton to Ontario and Chino in northwestern Riverside and southwestern San Bernardino Counties (U.S. Soil Conservation Service 1971, 1980). Accordingly, the DSF's historic range may have extended across this 40-square mile area, presumably in a sporadic distribution. Records of museum specimens of DSF, which extend from the eastern margin of the Delhi Sands formation in Colton to near its western limit in Mira Loma, lend support to this historic range assumption.

This region of Delhi series soils, also known as the Colton Dunes, is the largest inland cismontane sand dune formation in southern California. This dune formation has been defined as the Desert Sand-verbena series in Sawyer (1994). Some of the plant species present on the Colton Dunes include California buckwheat, California croton, deer weed (*Lotus scoparius*), and California evening primrose (*Oenothera californica*). The Colton Dunes habitat supports several plants and animals of limited distribution, including Delhi Sands metalmark butterfly (*Apodemia mormo* new subspecies), Delhi Sands Jerusalem cricket (*Stenopelmatus* new sp.), convergent apiocerid fly (*Apiocera convergens*), and Delhi Sands sand roach (*Arenivaga* new sp.), San Diego horned lizard (*Phrynosoma coronatum blainvillei)*, western burrowing owl (*Athene cunicularia hypergia*), Los Angeles pocket mouse (*Perognathus longimembris brevinasus*), and San Diego black-tailed jackrabbit (*Lepus californicus bennettii*).

Much of the Colton Dunes area has been used for agriculture, chiefly grapes and citrus, since the 1800's. More recently, a significant portion of the remaining area has been used for dairies, housing tracts, and commercial/industrial sites. According to the USFWS, the present distribution of the DSF is believed to represent only a small percentage of its former range (USFWS 1993). Habitat has been lost and fragmented due to urbanization, agricultural activities, sand mining activities, illegal dumping, off-road vehicles, and invasion of non-native plants (USFWS 1993, 1997). The majority of remaining sands with restoration potential are degraded to some degree.

As of spring 1997, the known distribution of the DSF was believed restricted to 12 extant populations encompassing approximately 450 acres of suitable habitat (USFWS 1997). According to the USFWS, there presently exists an estimated 1,200 acres of habitat that can support the species (USFWS 1997). The

USFWS currently estimates that approximately several hundred acres of additional land may be restorable to habitat suitable for the DSF (USFWS 1997).

LIFE HISTORY

The DSF undergoes a complete metamorphosis (egg, larva, pupa, and adult). The life span of this animal is unknown. Development to metamorphosis likely takes one year, but it is possible that the larval stage may last 2 years or longer, depending on availability of food, temperature, rainfall, and other environmental conditions. The egg, larva, and pupa stages of the DSF are spent underground. Only the brief adult stage is spent above ground. The adults emerge and become active in the late summer. Collection records for the DSF indicate a single annual flight period during August and early September when daytime temperatures exceed 27 degrees Celsius (80 degrees Fahrenheit) (Ballmer 1989). Lifespan in the adult form is not known (several days to several weeks has been postulated), but adults do not survive beyond the end of the flight period in September (Kiyani 1995).

Adult DSF are active during the warmest portions of the day during periods of direct sunlight, generally from 10 a.m. to 2 p.m. PDT (Ballmer in litt. August 24, 1991). The animals rarely fly during windy or breezy conditions, which typically occur in the afternoon. However, during these periods they have been located by disturbing the vegetation where they are perching (Ballmer ibid). Male DSF generally select sites with open sand allowing several feet of visibility from ground perches, while female DSF select buckwheat and telegraph weed cover (Kiyani 1996b).

Mating among members of this genus was described by Rogers and Mattoni (1993). After mating, the females lay their eggs (oviposit) in suitable sandy soil. Neither the typical number of eggs laid by females nor the potential range laid by females is currently known. Rogers and Mattoni (1993) described their observations of two male and two female captive DSF. The males lived for 3 days in captivity and would not eat. The females lived for 5 and 8 days, respectively. The females became active at 10 a.m. pacific daylight time (PDT) each day, regardless of light conditions and became quiescent about 5 p.m. PDT, except when ovipositing. One of the females was observed to oviposit at about 7:30 p.m. PDT. She laid a total of 40 eggs in the sand. The eggs were about 1.5 x 3 millimeters, almost kidney-shaped, and pure white with a slight pink iridescence.

Female DSF possess specialized egg-laying organs on the last segment on their abdomens. The eggs can be placed between 3 and 5 centimeters beneath the surface of the sand. This adaptation assures that the eggs are placed in a cooler and moister environment than the surface of the sand. Most oviposition takes place in the shade of shrubs, such as the telegraph weed (Rogers and Mattoni 1993). In the few observations of egg laying (ovipositing) by DSF, ovipositing took place within one foot of telegraph weed (Kiyani 1995). However, the required environmental factors which, when found together, constitute suitable ovipositing sites remain unknown.

It is unknown where the larval form lives below ground or what types of micro-environmental requirements the larval form may require. In captivity, larvae hatched from the eggs in 11 to 12 days (Rogers and Mattoni 1993). The larvae of the DSF and two other *Rhaphiomidas* species were held in captivity by Rogers and Mattoni (1993). All items of food, including synthetic diets that were offered to the animals, were rejected. Rogers and Mattoni (1993) reported that captive larvae refused to feed on small beetle larvae collected from the sand dunes, fruit fly larvae, or sand dune cockroach nymphs. None of the fly larvae became cannibalistic, even when starving. The larvae all died within fifteen days. It remains unclear as to whether the early stages of *Rhaphiomidas* are herbivores, detritivores, or carnivores. The larvae of the closely related genus *Apiocera* have been successfully raised on earthworms in the laboratory (Cazier 1982).

The DSF is a rapid flier and can hover like a hummingbird for nectar extraction. The species has been observed taking nectar and has not been seen to take other fluids. The nectaring events observed have been brief, on the order of 2-10 seconds, and have all been restricted to flowers of the California buckwheat (Kiyani 1997, USFWS 1997).

To date, little is known regarding predators of the DSF. The introduced Argentine ant (*Iriodomyrmex humilis*) has been observed to attack and kill a recently emerged adult DSF (R. Rogers, pers. obs. 1993). Rogers and Mattoni (1993) and Cazier (1985) reported that large asilid flies in the genera *Proctocanthus* and *Promachus* prey upon *Rhaphiomidas* flies. Other predators of the adult flies may include dragonflies and insectivorous birds. Predators of the early stages of the DSF are unknown, but may include ants, subterranean predatory insects, and reptiles.

HABITAT REQUIREMENTS, BEHAVIOR AND POPULATION DYNAMICS

Areas containing sandy substrates with a sparse cover of perennial shrubs and other vegetation constitute a primary habitat requirement for the DSF. Based on observations of several other members of this genus, optimal vegetative cover may be less than 50 percent, and may be in the range of 10-20 percent (USFWS 1997). DSF appear to avoid areas of dense (greater than 75 percent) vegetation cover (Kiyani 1996b).

The specific plant species and densities of such species required to create suitable DSF habitat are currently unknown (Kiyani 1996). Definitive associations of adults with specific plants have not been established. Typically, the most abundant native plant species found where the DSF has been found include California buckwheat, croton, and telegraph weed (Ballmer 1989). Additional native plants found commonly where the

DSF has been found include annual bursage, fiddleneck, vinegar weed (*Lessingia glandulifera*), and sapphire eriastrum (*Eriastrum sapphirinum*).

Invasive non-native vegetation severely degrades or eliminates the habitat of the DSF. Non-native plants of concern include Russian thistle, horehound (*Marribium vulqare*), mustard (*Brassica tournefortii*), cheese weed (*Malva parviflora*), and many species of introduced grasses such as ripgut brome and foxtail chess. These plants may alter the amount of soil moisture or make the substrate physically unsuitable for the survival of the DSF and other native subterranean invertebrates. The diversity and abundance of arthropods have been found to be significantly reduced or absent in coastal dune areas containing exotic plants versus areas with native vegetation (USFWS 1997).

Off-road vehicles (ORVs) are believed to have a negative impact on the DSF and the other plants and animals found in its habitat. (USFWS 1993). ORVs compact the soil, possibly crushing and killing subterranean forms of the species; flatten and destroy vegetation, thereby removing potential food and cover; and increase rates of erosion. The use of even low numbers of ORVs may disturb the feeding, breeding, or resting behavior of adult DSF (USFWS 1997).

Trampling, or disruption of the substrate, is a concern usually overlooked for dune systems. Trampling is deleterious because it destroys the cryptoflora crust, which is important to resisting invasive microorganisms and maintaining soil ecosystem integrity (USFWS 1997).

In addition to directly eliminating habitat, agricultural conversion and residential and commercial development often result in habitat fragmentation, which may negatively affect the dispersal of the DSF. Roads have been found to be a barrier to the movements of some butterflies, beetles, and other arthropods (USFWS 1997). USFWS personnel have reported that adult DSF have been observed to turn or reverse the direction of their flight upon encountering paved roadways. The extent to which paved roads actually present a barrier to DSF movement remains unknown, however. DSF have been reported to fly across construction sites, roads, desilting basins and the like (USFWS 1997).

The number of DSF observed in a population may fluctuate from day to day and from year to year at a given locality. Reliable estimates of population sizes for the DSF are lacking. At the San Bernardino County Hospital preserve, high and low population estimates ranged from 162-106 in 1994, 121-70 in 1995, 140-49 in 1996, and 98-35 in 1997 (Kiyani 1997). Kiyani (1996 a, b) notes a number of assumptions and uncertainties regarding population counts of the DSF, and thus these estimates are considered tentative. At another site in 1989, a direct count of 13 individuals was made within a half-hour over a 10-acre portion of a 150-acre site (USFWS 1997, Ballmer 1989).

DSF CONSERVATION EFFORTS

The USFWS finalized its Recovery Plan for the DSF in 1997 (USFWS 1997). The Plan describes the life history of the DSF, current knowledge about populations, threats to the species, and conservation measures to protect the species sufficiently so that it is downlisted to threatened.

Significantly, the Recovery Plan states that "the likelihood of extinction [of the DSF] remains high, unless habitat protection and captive breeding and release programs are initiated without delay." The USFWS considers the species as having a high threat and low recovery potential (USFWS 1997). The Recovery Plan has identified at least two high-priority actions to promote the recovery and conservation of the species: (1) a captive breeding program to help ensure against the potentially devastating effects of local extirpation at existing occupied sites, and (2) acquisitions of conservation habitat consistent with the Recovery Unit concept. The Recovery Plan defines three geographic areas as recovery units: the Colton, Jurupa, and Ontario Recovery Units. The Project Site lies within the Colton Recovery Unit. The Recovery Plan has a goal of eight protected populations in the three Recovery Units, with four of the populations in the Colton Recovery Unit. The Plan states that two of the protected populations in the Colton Unit should be north of I-10, and two south of I-10.

To date, no areas of critical habitat have been designated for the DSF.

The Recovery Plan has an objective of protecting approximately 350 to 360 acres of DSF habitat within Agua Mansa Enterprise Zone (AMEZ) for DSF conservation (USFWS 1996c, 1997). The Recovery Plan states that approximately 50 of these acres should be in the area of the intersection of Riverside Avenue and Jurupa Avenue. The Recovery Plan states that there is currently no data available to determine the acreage needed for a properly functioning DSF preserve and does not present a biological reason for a preserve size of 50 acres (USFWS 1997).

The Recovery Plan discusses the Agua Mansa Industrial Growth Association (AMIGA) Memorandum of Understanding (MOU), which was signed in 1996 and was originally proposed to serve as the basis for developing a regional HCP for the AMEZ. The AMIGA MOU covers approximately 10,800 acres of land within the AMEZ including roughly 4,000 acres of vacant land (USFWS 1996c). If completed, the AMIGA HCP would provide for approximately 350 acres of protected habitat for the conservation of DSF (USFWS 1996c).

The MOU calls for the AMIGA to make efforts to pursue the development and enactment of an HCP, if feasible, and for the USFWS to work with the AMIGA to that end. After pursuing the formation of an HCP to cover the entire AMEZ, the AMIGA has indicated that an HCP for the entire AMEZ is not feasible and will not be further pursued. The USFWS has indicated that it hopes the AMIGA will revisit the idea in the future.

The City of Colton has recently signed an MOU (Visy MOU) with the USFWS to explore the possibility of developing an HCP to cover approximately 240 acres for the Visy Paper Company project on land within the AMEZ. The Visy site is northeast of the project site in the city of Colton (Exhibit 5 Numbers 12, 13). The Visy MOU and resulting HCP would conserve approximately 160 acres within the 240-acre site for DSF conservation and allow the remainder to be developed. At this time, no HCP has been submitted or approved.

Currently, it is uncertain whether the AMIGA or Visy HCPs will be developed or implemented. Furthermore, there has been a notice filed with the USFWS by The Southwest Center For Biological Diversity and the Endangered Habitats League, pursuant to the Endangered Species Act, of an intent by these organizations to file a lawsuit over these MOUs. Such a lawsuit, if filed, may prevent completion and implementation of those HCPs under either MOU.

The City of Colton has established a preservation area of 7.5 acres of occupied habitat south of Interstate 10, near the Rialto/Colton border, just north of Santa Ana Avenue (Exhibit 5 Number 15). The conservation value of these 7.5 acres may be enhanced by the proposed dedication and enhancement of the Conservation Area by the Antonini Trust, which will enhance and maintain a contiguous area of additional habitat for DSF in the vicinity.

A DSF habitat restoration plan is being developed for the SCE parcels north and west of the Project Site (Exhibit 5 Numbers 14, 16). SCE and USFWS have been developing the plan, and implementation is expected to begin in the near future. This approximately 19-acre area is contiguous with the north edge of the Project Site. The conservation value of the SCE parcels may be enhanced by the proposed dedication and enhancement of the Conservation Area by the Antonini Trust, as these parcels are contiguous with the Conservation Area. The combined area of contiguous enhanced DSF habitat would be approximately 50 acres if the Proposed Action were to be adapted.

The Owl Company has agreed to set aside 6+ acres of an 11-acre site along Riverside Avenue as dedicated land for DSF conservation (Exhibit 5 Number 3). The remaining portion of the 11-acre site is planned to be developed for possible industrial development and secondary access to an adjoining developed site. This dedication agreement is part of the AMIGA MOU.

As part of the AMIGA MOU, Home Savings of America FSB has agreed to donate $450,000 for DSF habitat acquisition. According to the USFWS, the material terms of this agreement are now the subject of discussions between Home Savings' successor and the USFWS.

PROJECT SITE EXISTING CONDITIONS

Exhibit 7 illustrates the Project Site, depicting the parcels contemplated for industrial development and use and the Conservation Area to be dedicated for the recovery and conservation of the DSF.

A 1989 biological assessment of the Site prepared by Tierra Madre Consultants, Inc. noted that essentially the entire Site evidenced past human-induced disturbance. According to Tierra Madre, a citrus orchard area covered the Site and a windrow of eucalyptus trees lined the western boundary. As of 1989, Tierra Madre noted that virtually all native vegetation was absent from the Site and that domestic sheep grazing was occurring, or had been occurring on the Site recently. A vacant residence with several sheds and a block wall were located in the southern portion of the property. Illegal trash dumping was noted on the Site, particularly in the northern portion. Ballmer described the vegetation of the Site as consisting "mostly of introduced weeds such as *Avena barbata*, *Bromus diandrus*, and *Brassica geniculata*, but native species such as *Eriogonum fasciculatum*, *Croton californicum*, and *Heterotheca grandiflora* are also present in low density" (Ballmer 1989).

The majority of the 96-acre Site consists of the Delhi Sands soil formation (United States Department of Agriculture 1980) (see Exhibit 4). There are an estimated 20 acres of non-Delhi sand soil on the larger 87.5-acre parcel, leaving approximately 67 acres of Delhi Sands soil on the larger parcel. These acreage figures are based on published USDA soil maps, which are mapped at a large scale and thus represent approximations at the mapping scale of the Project Site. Although mapped as Delhi Sands soil, the 8.4-acre parcel does not appear to contain Delhi Sands soil as the parcel slopes down to the river plain and does not have the unconsolidated springy texture of Delhi Sands soil on the larger parcel. In any event, one to two acres of the native soil on the 8.4-acre parcel was removed by sand mining operations between the time of the USDA soil mapping and the purchase of the parcel by Antonini Trust. This results in at most 6 acres of Delhi Sands soil on the 8.4-acre parcel. Thus, there are an estimated 73 acres of Delhi Sands soil on the Project Site.

The topography of the Site consists of relatively level terrain with some rolling swales. Much of the Site was disced for fuel reduction in April 1997. Areas adjacent to the Site support developed and undeveloped land. A few eroded drainage channels interrupt the otherwise relatively level terrain of the Site.

The vegetation of the Site consists generally of a ruderal (weedy) mixture of native and non-native shrubs, forbs, and grasses that are good colonizers of disturbed areas. Vegetation cover on the Site varies from 100 percent to less than 5 percent; most of the site supports cover exceeding 90 percent. Overall the herbaceous/grass layer averages about 80 percent cover. Most of the Site is dominated by the non-native ripgut brome and mustard and the native annual bur-sage and telegraph weed. Other generally distributed common species are the non-native grasses, wild oats, ripgut brome, and foxtail chess. In the small open sandy areas and a few other small patches not recently disced, a few additional native species are prevalent, including California croton, tarweed, and fiddleneck. Castorbean and annual sunflower are common in the drainage ditch bordering Agua Mansa Road. The slope along the upper one-half of the Site's southeastern border is covered with a dense growth of non-native grasses, among which occur sparsely most of the other plant species mentioned above, as well as brittlebush (*Encelia farinosa*), valley cholla (*Opuntia parryi*), calabazilla (*Cucurbita foetidissima*), wild cucumber (*Marah macrocarpus*), jimson weed (*Datura wrightii*), and a few individuals of California buckwheat.

Native telegraph weed is common in places. In a few sparsely vegetated sandy unpaved roadways and in small patches of relatively open sand distributed occasionally to frequently within the otherwise typically dense vegetation cover, a few additional native species are prevalent, including California croton, tarweed and fiddleneck. Vegetation of this particular character and density is largely concentrated in small patches distributed across a 20- to 30-acre area in the northwestern portion of the Project Site.

Portions of the Site have been disturbed by past activities including citrus farming, grazing, unauthorized ORV use, weed abatement discing for fuel reduction, and illicit trash dumping.

Approximately 2,700 linear feet of underground water pipelines were constructed on the site between June 1996 and February 1997. The construction zone for trenching was 25 to 30 feet wide, with a wider area of soil excavated to provide stable banks surrounding the trenching zone. In some locations, the cutbanks are approximately 100 feet wide. The backfill material over the pipelines was compacted, and currently forms unpaved roadways on the site.

Historically, the Project Site has not been identified as containing a DSF population. In 1989, Greg Ballmer and two other observers investigated the Site on two days during the adult flight period; no flies were observed and Ballmer did not believe that the Site was currently occupied given the degraded and disturbed nature of the Site (Ballmer 1989). The USFWS made similar observations regarding the lack of current suitable habitat on a portion of the Site that was surveyed in 1994 (USFWS 1994a.)

DSF have been observed on lands near the Site. DSF have been observed in the SCE property near Riverside Avenue (Exhibit 5 Number 14, 16) (Ballmer 1989, Riggan 1996). There is an established population on the SCE property on either side of Riverside Avenue (Gould pers. comm.). This area is immediately adjacent to the proposed Conservation Area. Another established population is located approximately 3,000 feet northeast of the Project Site (ENSR 1997). Other sites of reported DSF occurrences within 2 miles of the Project Site are shown in Table 1 and Exhibit 5 and are discussed below.

FOCUSED SURVEY METHODOLOGY AND FINDINGS

As noted previously, although no DSF were observed during focused surveys conducted during 1995, 1996, and 1997, USFWS requested additional focused surveys for DSF in 1998. During the 1998 surveys there were 4 observations of DSF on a single day of the surveys. No DSF were observed mating, ovipositing, or feeding. The observations indicate a minimum of 3 individual DSF were present on the site on the day the observations were made: 2 males, and 1 female.

MBA conducted focused surveys for the DSF to determine the presence or absence of this species on the Site in 1995, 1996, and 1997. These focused surveys were conducted in accordance with the field methodologies of the USFWS' recommended protocol, which recommends, inter alia, that two visits per week for the typical 4-to-6 week flight period of the DSF be conducted during appropriate weather conditions (USFWS 1995). However, surveys in 1996 did not commence until the third week after the first sightings of a DSF were made at the County Hospital Site, so the 1996 surveys started later than that recommended by the USFWS.

No DSF were observed on the Project Site during any of the 1995-97 surveys. Over 216 hours of surveys were conducted during appropriate survey periods and under weather conditions suitable for observation of DSF by trained biologists with experience with DSF during the 1995-97 surveys.

1995 Focused Surveys

All areas of potential DSF habitat were surveyed 4 times per week for 4 weeks for a total of 16 visits, in order to obtain total coverage of the Site. During 1995, surveys commenced within 9 days of the first reported observation of DSF and were conducted on August 18, 22, 24, 25, 27, 30, 31, and September 1, 5, 6, 7, 8, 11, 12, 13, and 14. Weather conditions during the 1995 surveys were conducive to high levels of invertebrate activity. Temperatures ranged from 26 to 46 degrees Celsius (79 to 115 Fahrenheit). Wind speed ranged from 0 to 8 kilometers per hour (0 to 5 miles per hour). Surveys were conducted between 8:00 a.m. and 3:30 p.m. by MBA biologist Amy B. Dickerson. Approximately 104 person-hours of surveys were conducted in 1995.

During the 1995 surveys, potential DSF habitat was walked in search of patrolling males and resting flies of both sexes. Air space above flowering plants was watched carefully for flying insects. Patches of open sand, flowers, and plant stems were examined for resting flies. Flowers were also examined for feeding flies. All insect taxa encountered at flowers were noted (to family, or if possible to genus). Insects unidentifiable visually were captured (when possible) in an insect net for closer examination.

No DSF were observed on the Project Site during the 1995 surveys.

1996 Focused Surveys

During the 1996 surveys the Site was surveyed 2 times per week for 4 weeks for a total of 8 visits. The surveys were conducted on August 24, 25, 29, and 31, and September 1, 8, 9, and 12, 1996. The entire Site was covered on foot between the hours of 9 a.m. and 4 p.m. Weather conditions during the surveys were conducive to high levels of invertebrate activity. Temperatures ranged from 29 to 39 degrees Celsius (84 to 102 degrees Fahrenheit). Wind speed ranged generally from 0 to 17 km/hr (0 to 10 mi./hr). Surveys were conducted by Larry Munsey, an entomologist having specialized experience with the DSF. Approximately 48 person-hours of surveys were conducted in 1996.

No DSF were observed on the Project Site during the 1996 surveys.

1997 Focused Surveys

During the 1997 surveys, the Site was surveyed 2 times per week for 7 weeks for a total of 14 visits. The surveys commenced within 4 days of the first reported sightings of DSF in 1997, and were conducted on August 10, 11, 16, 17, 22, 25, 29, and 30, and September 5, 8, 12, 16, 19, and 20, 1997. The entire Site was covered on foot between the hours of 10 a.m. and 3 p.m. Weather conditions during the surveys were conducive to high levels of invertebrate activity. Temperatures ranged from 24 to 40 degrees Celsius (75 to 104 degrees Fahrenheit). Wind speed ranged generally from 0 to 8 km/hr (0 to 5 mi./hr) with occasional gusts to 17 km/hr (10 mi./hr); skies were generally clear, with a few exceptions when overcast conditions prevailed. Surveys were conducted by Larry Munsey. Approximately 64 person-hours of surveys were conducted in 1997.

No DSF were observed on the Project Site during the 1997 surveys.

1998 Focused Surveys

During the 1998 surveys, the Site was surveyed 2 times per week for 5 weeks, between the hours of 1000 and 1400, commencing 17 August 1998 and concluding 20 September 1998. The surveys were conducted in accordance with USFWS interim general survey guidelines (USFWS 1996b), except for two special modifications pursuant to prior agreement with the USFWS: (1) the survey area was limited to 50 acres, selected in cooperation with USFWS biologists to include all the small patches and other areas containing vegetation of a composition and density associated with potential use by DSF within the site's total 96 acres; (2) the duration of the survey period was 5 (rather than 7) weeks. The survey area included the SCE easement. Surveys were performed by Larry Munsey.

Surveys were conducted on foot, generally following a transect pattern that reflected the location of areas containing patches, regardless of their size, of relatively open, sparsely vegetated Delhi Sands soils. These areas were determined by an on-the-ground habitat assessment conducted by Mr. Munsey in cooperation with USFWS personnel. The areas selected for surveying were selected to encompass all areas of sparsely vegetated sand that could be arguably used by opportunistic DSF. Weather conditions during the surveys were generally conducive to high levels of invertebrate activity. Temperatures typically ranged between 26 and 40 °C (78-104 °F). On a few occasions temperatures during the first one to two hours of the survey period were lower, ranging in the low to mid-20°s C (70°s F). Only in one instance did the low temperature fail to exceed 27 °C (80 °F) by noon (mid-survey), or during any time of the survey-day. Wind speed ranged generally from 0 to 8 km/hr (0 to 5 mi./hr) with occasional gust to 25 km/hr (15 mi./hr). Skies were generally clear, with some exceptions when overcast conditions prevailed. Approximately 40 person-hours of surveys were conducted during the 1998 surveys.

There were four (4) DSF observations on the Project Site during one of the survey-days in 1998. Individual DSF detection's were made on four different occasions between 1145 and 1215, August 27, 1998, each sighting was separated by short intervals of less than a minute to several minutes. Three of the sightings were of a male, and one of a female. Each of the male sightings involved continuous observation for a half-minute to a few minutes in duration. In all instances, these individuals were engaged in "cruising" flight behavior, sometimes coming to brief rest on the ground or a low-lying plant. The female flew from vegetation and was observed for only a few seconds while in flight.

Of the three sightings involving male DSF, the first two sightings conclusively represent separate individuals, due to distinct differences in size and morphology of the DSF. The second and third male sightings suggested the strong possibility of being the same individual, because the sightings occurred quite closely in time and space, and the DSF were indistinguishable in appearance.

The DSF sightings occurred in a sandy unpaved roadway located within the northwestern portion of the Project Site (Exhibit 6). This unpaved roadway lies perpendicular to the site's western border from which it extends eastward for a few hundred meters across the site. All sightings were made within an approximately 50-m (150 feet) radius near the boundary of the property at Industrial Way. The sightings were within the proposed Conservation Area.

The observations suggest that three (3) DSF were present on the Site on August 27, 1998.

INTERPRETATION OF SURVEY FINDINGS

Prior to 1998, focused surveys of approximately 216 hours conducted over three consecutive years (1995, 1996 and 1997) indicated that DSF did not occur on the Project Site. These focused surveys were conducted by biologists familiar with the DSF and conducted according to the scientific methodologies of the recommended protocols, and did not find any DSF on the Site. Although the surveys conducted on the Site in 1996 did not commence at the very outset of the 1996 DSF flight season, MBA believes the survey results for 1996 are reliable because such surveys were conducted during the normal DSF flight season as noted in USFWS protocol, DSF were noted as late as September 2 on nearby properties (Olsen 1996) and the surveys were carried out in accordance with the field methods called for in the USFWS protocol by an entomologist of considerable experience. The 1996 data supports the data from surveys in 1995 and 1997 and the surveys conducted by Ballmer in 1989 during which no DSF were observed (Ballmer 1989). Additionally, surveys by USFWS on a portion of the Site observed no DSF and concluded that the area surveyed was of low suitability for DSF due to the high level of disturbance on the property (USFWS 1994a).

Habitat surveys indicate that the Site generally contains disturbed, degraded habitat which is unsuitable for DSF. Currently most of the Site supports vegetative cover exceeding 90 percent, with percent cover varying from 100 percent to less than 5 percent. Overall, the herbaceous/grass layer averages about 80 percent cover on the Site. As noted previously, DSF appear to avoid areas of dense vegetation cover (greater than 75 percent), with males selecting areas of open sand as perch sites during mating season, and females using buckwheat and telegraph weed for perches and ovipositing immediately adjacent to telegraph weed (Kiyani 1995, 1996a, b, 1997). Although the entire 96-acre Site contains approximately 73 acres of Delhi Sands soils, the vegetation community on the Site is generally unsuitable for DSF. The plant community on Site is dominated by non-native species, has a dense stand structure, and contains little bare ground. Plant communities such as these are considered unsuitable habitat for DSF (USFWS 1997, Ballmer 1989). The data from the 1995-97 focused surveys and the habitat assessments were mutually supportive and reinforcing. The data from the 1995-97 focused surveys supported the conclusion that DSF did not occur on the Site.

It could be argued that data from the 1998 surveys indicate that a small portion of the Site appears occupied by DSF. This small area lies within the proposed Conservation Area along the open sandy unpaved roadway area formed by maintenance activities for an existing underground water line. As noted previously, the unpaved roadway and associated cutbanks were disturbed by construction of underground water pipelines between June 1996 and February 1997. The unpaved roadway area contains open sand and is sparsely vegetated with scattered croton and telegraph weed. This area is within the proposed Conservation Area. This Area is approximately 100 feet wide and 400 feet long and encompasses approximately one acre.

Although the Site generally does not contain suitable habitat for DSF, the Site contains Delhi Sands soil, the fundamental component of DSF habitat. A few of the plant species associated with DSF habitat are scattered sparsely across the Site, but the Site is currently dominated by other plant species, particularly non-natives. Thus, a portion of the Site appears to contain potentially restorable DSF habitat. Removal of non-native plants, opening areas of bare soils, and planting of key native plant species would be basic to restoring DSF habitat on the Site.

As noted previously, there are sparsely vegetated sandy unpaved roadways and small patches of relatively open sand distributed occasionally to frequently in the 20- to 30-acre area in the northwestern portion of the Project Site. These more open areas are within a matrix of otherwise typically dense vegetation cover. Within the scattered open patches a few native species are prevalent, including California croton, telegraph weed, tarweed, and fiddleneck. The USFWS has indicated that the Site provides suitable habitat for the DSF, especially within the Conservation Area.

In general, the ESA does not regulate potentially restorable or unoccupied habitat on private property. For the most part, to qualify as a take under the ESA, the loss of suitable habitat must directly and imminently lead to the injury or death of one or more specific members of the listed species. Data from focused surveys suggest that a relatively small but unquantifiable number of DSF may be killed or injured by the Proposed Action during the term of the Permits.

KNOWN LOCATIONS AND OBSERVATIONS OF DSF IN THE PROJECT SITE VICINITY

The USFWS DSF Recovery Plan states that there are 12 known locations inhabited by DSF. These sites and their population numbers are not described in detail in the Plan (USFWS 1997).

There are nine locations of reported observations of DSF within 2 miles of the Project Site. Reported sightings include single observations of DSF, which may be transient individuals, and multiple observations, which may indicate established populations. Reported observations in the vicinity of the Project Site as of DSF survey year 1997 are shown in Table 1, mapped in Exhibit 5 and described below.

TABLE 1

DELHI SANDS FLOWER-LOVING FLY SURVEY SITES IN THE PROJECT SITE VICINITY AS KNOWN IN 1997

Map #	Property Name	Acreage	DSF Observed	Established Population	Reference
1	Angelus Block	96	No	No	MBA 1995, 1996, 1997 Ballmer 1989
2	Owl Company Mine Site	217	No	No	Riggan 1996
3	Owl Company Access Site	11	Yes, 2	Unknown	Riggan 1996
4	Inland Empire Composting	107	No	No	FH&A 1994
5	Trism/Rialto Land Co./Singletary	10	Yes, 2	Unknown	USFWS 1996a
6	Agua Mansa Industrial Center	250	Yes, 3	Unknown	Thomas Olsen 1996
7	Hospital Mitigation Site	9	Yes, many	Yes	Kiyani 1996
8	Santa Fe Buckwheat Parcel	17	Yes, 1 or 2	Unknown	Tierra Madre 1997
9	Santa Fe Sycamore North	19	Yes, many	Yes	Tierra Madre 1997
10	Santa Fe Sycamore South	5	No	No	Tierra Madre 1997
11	Colton/San Bernardino Water Treatment	35	No	No	Thomas Olsen 1997
12	Visy Proposed Project Site	80	Yes, Multiple	Unknown	Woulfe pers. comm.
13	Visy Proposed Conservation Area	160	Yes, many	Yes	ENSR 1997
14	SCE Area #1	9.4	Yes, multiple	Yes	Riggan 1996
15	Colton Transmission Line Mitigation Site	7.5	Yes	Yes	ENSR 1995
16	SCE Area 2	9.6	Yes, 4	Unknown	Ballmer 1989

Focused surveys were conducted during the 1994 and the 1996 DSF flight seasons on the Owl Company Access site (Exhibit 5 Number 3). Three surveys were conducted in 1994. No DSF were observed during the 1994 surveys. Five surveys were conducted in 1996. Two DSF were observed on the Owl Company Access Site during 1996 surveys, and it is not known whether there is an established population at the site (Riggan 1996). The majority of the approximately 11-acre site is composed of Delhi Sands soil. The northern portion of the site is composed of somewhat open dune-like vegetation, while the southern portion is dominated by ruderal vegetation. Six acres of this 11-acre site are to be set aside for DSF conservation, and the remaining acreage of the access site, as well as the 217-acre Owl mine site (Exhibit 5 Number 2), are to be developed (USFWS 1996c).

The habitats on the 107-acre Inland Empire Composting site (Exhibit 5 Number 4) were surveyed in September 1994 to assess suitability for DSF. The site contains riverine deposit soils, does not contain

Delhi Sands soils, and is considered unsuitable for DSF (FH&A 1994). No DSF were observed. Focused surveys for DSF were not conducted.
Six focused surveys for DSF were performed by USFWS personnel and consultants in 1996 on the Trism/Rialto/Singletary property (Exhibit 5 Number 5). A minimum of two DSF were observed on the Trism/Rialto /Singletary property in 1996, it is not known whether there is an established population at the site (USFWS 1996a). The Trism/Rialto/Singletary property is currently undeveloped and contains Delhi Sands soils and some native plants. The USFWS considers the Trism property a potential DSF movement corridor and potentially a breeding site in good years (USFWS 1996a). The site is approximately 9.75 acres in size.

The Agua Mansa Industrial Center site (Exhibit 5 Number 6) was surveyed 12 times during the 1996 DSF flight season. Three DSF were observed in 1996 (Thomas Olsen 1996), it is not known whether an established population exists on the site. The Agua Mansa Industrial Center site is approximately 250 acres in size. Most of the site was disced in June 1996 prior to the surveys. Vegetation on the site before discing had been dominated by non-native grasses. Some of all of the site has been provided Incidental Take authorization by USFWS. The terms of this arrangement are currently the subject of discussions between the USFWS and the property owner(s).

There is a small established population, estimated to be between 35-162 individuals (Kiyani 1987), at the San Bernardino Hospital Mitigation site (Exhibit 5 Number 7). The site has been the location of behavioral studies of DSF for several years (Kiyani 1995, 1996 a, b, 1997). The site contains a stand of native vegetation and open unvegetated sand (Kiyani 1996). Ten acres have been preserved as DSF habitat (USFWS 1997).

DSF have been observed on two parcels of land owned by Santa Fe Pacific Pipeline Partners LP: the 17-acre Buckwheat parcel and the 19-acre Sycamore North parcel (Tierra Madre 1997) (Exhibit 5 Numbers 8, 9). Fourteen surveys were conducted in 1997 on each parcel. Only two DSF were observed on the Buckwheat parcel, and it is not known whether there is an established population or whether these were transient individuals. There have been numerous DSF observed on the Sycamore North parcel including pupal cases and an emerging male indicating there is an established DSF population at this site (Tierra Madre 1997). The Sycamore North parcel is considered high quality occupied DSF habitat (Tierra Madre 1997). A third parcel owned by Santa Fe Pacific Pipeline Partners LP, the 5-acre Sycamore South parcel (Exhibit 5 Number 10), was surveyed along with the other Santa Fe parcels. The Sycamore South parcel has been graded, contains no suitable DSF habitat, and no DSF were observed.

The Colton/San Bernardino Water Treatment site (Exhibit 5 Number 11) does not contain Delhi Sands soil (Olsen 1997). Thus, it was determined that the site does not contain DSF habitat (Olsen 1997). Focused surveys for DSF were not conducted.

The Visy site occupies approximately 240 acres and is divided into an 80-acre project site and a 160-acre conservation area (Exhibit 5 Numbers 12, 13). Six surveys for DSF were conducted in 1997, with results consistent with data collected in 1996. There have been DSF observed at the proposed Visy 80-acre project site, (Woulfe pers. comm.) (Exhibit 5 Number 12). There have been numerous observations of DSF in the proposed 160-acre conservation area (Exhibit 5 Number 13) associated with the proposed Visy project (ENSR 1997). There appears to be an established population in the proposed conservation area (ENSR 1997).

DSF were observed on the SCE Area #1 (Exhibit 5 Number 14) in 1994 by USFWS biologist Jeff Newman (Riggan 1996). Several DSF were observed and used as a check on DSF activity during the 1994 surveys of the Owl Company Access site.

The Colton Transmission Line Mitigation Site (Exhibit 5 Number 15) has been reported as being occupied by DSF (ENSR 1995). Details of site surveys, and DSF observations are not readily available.

The SCE Area 2 (Exhibit 5 Number 16) was surveyed on three days in 1989. Four DSF were observed (Ballmer 1989).

OTHER SPECIAL STATUS SPECIES WITH POTENTIAL TO OCCUR ONSITE

A review of recent listings under the FESA and data from the California Natural Diversity Database (CNDDB) for the San Bernardino South and Fontana USGS topographic quad maps indicate thirty special status species are known to occur within the region of the Site (CDFG 1997). An assessment of the species' respective habitat preferences, conditions on Site, and discussions with USFWS show that twenty of these potentially occur on the Site, as the Site contains appropriate conditions and is in the geographic range of the species. These are briefly described below.

Special status species are native species that have been accorded special legal or management protection because of concern for their continued existence. There are several categories of protection at both federal and state levels, depending on the magnitude of threat to continued existence and existing knowledge of population levels.

Sources used to determine potential occurrence of special status species include: U.S. Fish and Wildlife Service (USFWS 1993; 1994b, 1996d), California Department of Fish and Game (CDFG 1996a,b, 1997, 1998a, b), California Native Plant Society (Skinner and Pavlik 1994) California Wildlife Habitat Relationships Database System (CDFG 1991), Remsen (1978), and Williams (1986).

Plants

The Santa Ana River woollystar (*Eriastrum densifolium ssp. sanctorum*) is listed as endangered under federal and state law. It is an erect, many branched, bright blue flowered, perennial herb. It is found within the Santa Ana River drainage on sandy soils of river floodplains and terraced alluvial deposits. The woollystar has not been observed on the Site and is not expected to occur, as suitable habitat is not present.

Wildlife

The San Diego horned lizard (*Phrynosoma coronatum blainvillei*) is a federal species of concern and a California species of special concern. It is a small, spiny, somewhat rounded lizard that occurs primarily in open or sparse coastal sage scrub and chaparral communities. This species prefers loose friable soil for burrowing. Three factors have contributed to its decline: loss of habitat, overcollecting, and the introduction of exotic ants. In some places, especially adjacent to urban areas, the introduced ants have displaced the native species upon which the lizard feeds. The horned lizard has not been observed on the Site, and is not expected to occur on the Site, as their preferred open habitat is not present.

The silvery legless lizard (*Anniella pulchra pulchra*) is a CDFG species of special concern. It is a small, secretive, snake-like lizard that lives and forages in leaf litter, under debris, or within sandy soil (Stebbins 1985). It occurs in a variety of habitats, including sandy washes, sandy soil, coastal scrub habitats, and woodlands. The silvery legless lizard preys on insect larvae, small adult insects, and spiders (CDFG 1991). This species may occur on the Site as the Site is in the geographic range of the lizard and sandy soil is present.

The northern red diamond rattlesnake (*Crotalus ruber ruber*) is a CDFG species of special concern. This subspecies is most commonly encountered in open scrub habitats such as coastal sage scrub, but it also inhabits grasslands, dry washes, chaparral, and woodlands. The northern red diamond rattlesnake ranges from southern San Bernardino County, south into Baja California, and from sea level to around 5,000 feet (Stebbins 1985). This species may occur on the Site as low value habitat is present.

The white-tailed kite (*Elanus leucurus*) is a fully protected species in California. It feeds on rodents (especially voles) and large insects that it hunts by hovering over suitable habitat. It forages over open grassland and nests in trees in a variety of habitats. Winter roosts usually occur in oaks and other large trees associated with streams, rivers, and marshlands. This species may occasionally forage over the Site; however, suitable nesting habitat is absent.

The golden eagle (*Aquila chrysaetos*) is both fully protected and a CDFG species of special concern, and is protected by a 1963 amendment to the Bald Eagle Act of 1943. This bird is an uncommon-to-rare permanent resident in open habitats throughout California. It nests in high trees and on rock faces of cliffs, and forages over plains and in open country. This species has been observed flying over the Site; no suitable nesting habitat is present.

The sharp-shinned hawk (*Accipiter striatus*) and Cooper's hawk (*Accipiter cooperii*) both are CDFG species of special concern. Both species breed in woodlands and forests. Cooper's hawk is both a resident and winter visitor in southern California; the sharp-shinned hawk is only a winter visitor. During winter months these two species forage in urban areas. Both may occasionally forage over the Site, there is no nesting habitat on the Site.

The prairie falcon (*Falco mexicanus*) is a CDFG species of special concern. It requires cliffs or rocky outcrops for nesting and dry open areas for foraging. Its prey includes small mammals, small birds, and reptiles. This species may occasionally use the Site for winter foraging; no suitable breeding or nesting habitat is present.

Other raptors that are uncommon to rare in the region may forage on the Site during migration. These include the ferruginous hawk (*Buteo regalis*), northern harrier (*Circus cyaneus*), and merlin (*Falco columbarius*), all CDFG species of special concern, and Swainson's hawk (*Buteo swainsoni*), a state-threatened species.

The western burrowing owl (*Athene cunicularia hypergia*) is a CDFG species of special concern. Formerly common throughout California, its decline was noticeable as early as the 1940s. The burrowing owl lives in the abandoned burrows of ground squirrels and other burrowing animals, modifying the burrows to suit its needs by digging. It is one of the few owl species often seen during the day, perched on fenceposts or at the entrance to burrows. Although the sandy soil conditions of the Site would limit the size and longevity of burrows, a burrowing owl was observed on site near an abandoned, exposed concrete pipe.

The California horned lark (*Eremophila alpestris actia*) is a CDFG species of special concern. This is the southern and central California resident subspecies of the widespread horned lark. California horned larks are found in sparse grasslands, some agricultural areas, and open brush with extensive bare ground. Horned larks nest on the ground in grasslands. Potential California horned lark breeding habitat is present on the Site.

The loggerhead shrike (*Lanius ludovicianus*) is a CDFG species of special concern. This bird prefers open habitats with scattered shrubs, trees, posts, fences, or other perches. It nests in trees or shrubs adjacent to open areas. It preys on large insects such as grasshoppers, and will also take small mammals, birds, and reptiles. This species occurs on the Site.

The California mastiff bat (*Eumops perotis californicus*), pallid bat (*Antrozous pallidus*), and pale big-eared bat (*Plecotus townsendii pallescens*) are CDFG species of special concern. These species require rocky areas, abandoned mines or buildings, or other such habitat for roosting. Suitable roosting habitat for these species does not occur on the Site, but they may forage over the Site.

The San Bernardino kangaroo rat (*Dipodomys merriami parvus)* (SBKR) is listed as endangered under the ESA. The historical range of the SBKR extends from the San Bernardino Valley in San Bernardino County to the Menifee Valley in Riverside County (USFWS 1998). The SBKR is now primarily associated with a variety of sage scrub vegetation, where the common elements are the presence of sandy soils and relatively open vegetation structure (USFWS 1998). Where the SBKR occurs in alluvial scrub, the SBKR reaches its highest densities in early and intermediate seral stages (USFWS 1998). Conversations with USFWS staff indicate that SBKR may have historically occurred on the Project Site, and USFWS requested that surveys be conducted for SBKR.

Focused surveys for SBKR were conducted from November 18 to 22, 1998. A total of 1,240 trap nights were conducted following USFWS protocols by a biologist permitted to conduct SBKR surveys. Traps were placed in those areas that had the greatest likelihood of capturing SBKR based on habitat, soil conditions, and evidence of rodent activity. No SBKR or other kangaroo rats were captured or observed. It is concluded that the SBKR does not occur on the project site.

The Los Angeles pocket mouse (*Perognathus longimembris brevinasus*) is listed as a species of concern by the federal government and a species of special concern by CDFG. The pocket mouse occurs in grasslands and coastal sage habitats within the Los Angeles basin from Burbank and San Fernando to San Bernardino South to Cabazon and Hemet. The Los Angeles pocket mouse has been reported in the region (Tierra Madre 1997). The Los Angeles pocket mouse occurs on Site. Los Angeles pocket mice were captured during the surveys conducted for SBKR.

The San Diego black-tailed jackrabbit (*Lepus californicus bennettii*) is a CDFG species of special concern. Its range includes grasslands, coastal sage scrub, and chaparral in coastal regions of California from Ventura County to northern Baja California. The black-tailed jackrabbit is most active at dawn and dusk and feeds on green vegetation. This species may occur on the Site.

IMPACTS TO THE DSF THAT MAY RESULT FROM THE PROPOSED ACTION

Although it is impossible to project with any meaningful degree of accuracy, it appears most likely that no more than ten (10) DSF may be killed or injured by the Proposed Action. Regardless of the actual number, however the protection in perpetuity of approximately 30.5 acres of DSF habitat is expected to provide a net-benefit to conservation of DSF on the Site as explained below.

The development of the Site will result in the loss of approximately 43 acres of potentially restorable DSF habitat of which it can be argued that one acre appears occupied by DSF. As noted, a small portion of the Site within the proposed Conservation Area appears occupied by DSF. This roadway area is approximately one acre in size. The entire Project Site contains approximately 96 acres in two parcels. The smaller 8.4-acre parcel is not currently planned for development. The larger 87.5-acre parcel has been subdivided and is entitled for development. There are an estimated 20 acres of non-Delhi Sand soils on the larger parcel, leaving approximately 67 acres of Delhi Sands soil as potentially restorable DSF habitat on the larger parcel. These acreage figures are based on published USDA soil maps, which are mapped at a large scale and thus represent approximations at the mapping scale of the Project Site. Although mapped as Delhi Sands soil, the 8.4-acre parcel does not appear to contain Delhi Sands soil as the parcel slopes the river plain and does not have the unconsolidated springy texture of Delhi Sands soil on the larger parcel. In any event, one to two acres of the native soil on the 8.4-acre parcel was removed by the adjacent landfill operation between the time of the USDA soil mapping and the purchase of the Site by the Antonini Trust. This results in at most 6 acres of Delhi Sands soil on the 8.4-acre parcel. The Conservation Area will consist of 30.5 acres; thus, up to approximately 43 acres of unoccupied but potentially restorable DSF habitat could be affected by the proposed development.

The Conservation Area includes the locations where DSF were observed in 1998. The observations were made in an area that was excavated in 1997/98 for construction of an underground water pipeline. The DSF observation locations lie within an easement for an existing underground water line. These locations are included within the Conservation Area even though the easement will be subject to periodic soil and substrate disturbance in the future, as the water line must be accessed from time to time for periodic maintenance by the City of Rialto, and/or the West San Bernardino County Water District. The open, sandy, sparsely vegetated condition where the DSF were observed is likely an artifact of the construction of the pipeline. The open vegetation is strongly associated with the easement and the adjoining cutbanks, while the immediately surrounding vegetation (outside the obvious construction area) is much denser and dominated by nonnative species. Any DSF that may reside within the easement would be potentially injured or killed during periodic or emergency repair activities. Moreover, as active water lines already exist in this area, any DSF in this area could be injured or killed as the result of uncontrollable breaks or leaks in this water system which in turn could lead to a consequent change in soil conditions. Moreover, neither the City of Rialto, nor the West San Bernardino County Water District are receiving incidental take authority by virtue of the Applicants' Section 10(a) permit. Any of the City of Rialto's, or the West San Bernardino County Water District's activities that may result in incidental take will require a separate take permit for the agency responsible for the take.

There will be no storage of any material in the Conservation Area. Outdoor storage of finished concrete block and concrete paver in the SCE easement outside the Conservation Area is not expected to impact DSF or the Conservation Area. The concrete block and concrete paver are solid and composed of inert concrete and rock. There will be no storage of toxic or hazardous material in the outdoor storage area.

The proposed block plant, paver plant and E-Z Mix East Complex will comply with all air and water quality regulations. The three facilities will receive Portland cement binders and natural aggregate materials that consist of sands and gravels. Aggregates will be received in a moist state and transferred to storage without visible dust emissions. All transfer of dry materials during processing will be done with equipment vented through air pollution equipment approved by the Air Quality Management District (AQMD). The facilities will employ bag houses on the cement processing silos to control dust emissions. The bag house systems will employ mechanical gauges to indicate static pressure differential cross the bags, and will be maintained on a regular basis. Any emissions from the facilities will meet stringent air quality regulations. For these reasons emissions from the facilities are not expected to affect DSF or soils or habitat in the Conservation Area. Currently there are ongoing heavy industrial uses in the area of the Project Site that produce various emissions. These uses include cement production, mining and landfill operations.

Nighttime lighting in those lots near the Conservation Area will be directed away from the Conservation Area in a manner to avoid potential impacts on DSF.

A stormwater drainage system will be constructed for the Project Site that will convey water downhill to the south away from the Conservation Area in the northern end of the Site. Thus, no indirect effects to the Conservation Area are anticipated from stormwater. Accidental spills from facilities constructed on the Project Site are likewise not expected to affect the Conservation Area, as spilled material would be handled by established spill containment procedures approved by regulatory agencies, and spilled material would be expected to flow downhill away from the Conservation Area.

SCE activities within SCE's non-exclusive electric transmission easement within the Conservation Area are not expected to impact DSF or DSF habitat. As previously noted, SCE uses an existing dirt roadway in the proposed Conservation Area to access transmission towers that are outside of and to the west of the proposed Conservation Area in order to conduct periodic inspection and maintenance of these towers and to wash transmission tower insulators. The dirt road is approximately 16 feet wide. Insulator washing is done approximately every 6 weeks using pressurized water. The washing occurs outside the Conservation Area. Thus, SCE maintenance activities are not expected to impact DSF or habitat in the Conservation Area.

SCE has adopted an endangered species sensitivity training program for its employees, called the Endangered Species Alert Program (ESAP). Through the ESAP, SCE employees receive endangered species sensitivity training and are provided a manual identifying SCE transmission areas which contain or are within one mile of locations of endangered species. The ESAP contains procedures to follow in DSF sensitive areas such as the proposed Conservation Area. The ESAP covers topics such as appropriate general activity precautions, appropriate operating procedures in emergencies, and appropriate timing of activities in DSF sensitive areas.

Additionally, SCE is preparing a formal multi-species Habitat Conservation Plan to govern SCE's activities within electrical transmission line easement areas that contain listed species including the DSF. This additional program will be reviewed by USFWS, and when adopted will provide a further measure of protection for DSF from SCE activities within the Conservation Area. Moreover, SCE is not receiving incidental take authority by virtue of the Applicants Section 10(a) permit. Any of SCE's activities that may result in incidental take will require SCE obtain a separate take permit.

Following initial discussions with USFWS, the Conservation Area was redesigned from the original elongated area on the north and east of the Site to a more square-shaped 13.4-acre area in the northwest section of the Site. The redesign of the Conservation Area was done to reduce edge effects by providing a roughly square-shaped area rather than the long narrow area originally planned. Reshaping the Conservation Area increased the ratio of interior acreage to edge distance over the originally proposed design. This resulted in greater ratio of interior area-to-edge that is generally regarded as a more effective conservation reserve design. The design of the 13.4-acre Conservation Area thus increased its conservation value and increased the ability to maintain the restored habitat in a suitable condition over time.

Following further discussions with USFWS, the Conservation Area has been more than doubled in size to approximately 30.5 acres and includes the location where DSF were observed in 1998. This further increases the ratio of interior area-to-edge in the Conservation Area, and maximizes its conservation value. Significantly the Conservation Area is located so as to be contiguous with the SCE property to the north and west, which is likely to be used for DSF habitat restoration and protection in the future.

The proposed approximately 30.5-Acre Conservation Area contains small, sparsely vegetated sandy patches scattered within a matrix of otherwise typically dense vegetation cover. These sparsely vegetated sandy patches contain some native plant species including California croton, tarweed, fiddleneck and telegraph weed.

For the above reasons, the Conservation Area contains the most suitable and appropriately located habitat for DSF conservation found on the Project Site.

Following the further discussions with USFWS, concurrent with the issuance of the Section 10(a) Permits and prior to any ground disturbance on Lots 1, 2, or the Conservation Area will be restricted in perpetuity by a legal instrument such as a recorded Declaration of Restrictions or similar mechanism, and the Applicants an endowment fund, the annual proceeds of which will be used for ongoing maintenance, adaptive management, enhancement, monitoring, reporting and to respond to changed circumstances in the Conservation Area. The Applicants would also construct a chain link fence around the Conservation Area to prevent unauthorized access, construct a solid fence along the southern boundary of the Conservation Area to prevent soil loss, and perform initial weed and trash removal to increase the suitability of the Conservation Area for the DSF. In consultation with the USFWS, Permittees shall conduct initial weed and trash removal, where appropriate, throughout the Conservation Area within six months of the effective date. Provided that field experience on the Project Site demonstrates it is practicable, such chain link fencing will also use silting screens along lower portions of the fence to assist with Delhi series sand retention within the Conservation Area. The Conservation Area will be posted with signs indicating that the area is environmentally sensitive and that trespassing is prohibited.

Removal of dense nonnative vegetation and exposing bare sands is expected to provide improved habitat for DSF. For example, clearing of vegetation and exposing bare soil without planting on approximately one acre at the San Bernardino Hospital Mitigation Site resulted in DSF use of the cleared area in the subsequent DSF flight season. Moreover a population of the DSF is believed to exist nearby on SCE property near Riverside Avenue.

As noted previously, the USFWS has stated an objective of obtaining approximately 350 to 360 contiguous acres of DSF habitat within the AMEZ to be used for DSF conservation (USFWS 1996c, USFWS 1997). Furthermore, the USFWS has targeted the acquisition of approximately 50 of these acres to occur in an area near the Project Site. The Proposed Action would further this objective by contributing approximately 30.5 acres at no cost which could be directly linked with other properties in the area for DSF conservation.

There are other properties in the vicinity of the Site which are being considered for DSF conservation and may contribute toward the USFWS goal of an approximately 50-acre conservation area. These and other properties in the vicinity of the Project Site are shown in Exhibit 8 and Table 2.

There are approximately 10 acres in the SCE property contiguous with the north side of the Site on the east side of Riverside Avenue (Exhibit 8, Number 4). There are an additional approximately 9 acres in SCE property on the west side of Riverside Avenue (Exhibit 8, Numbers 7, 8). A DSF habitat restoration plan is being developed for the SCE properties. Implementation of the restoration plan is expected to begin in the near future. These SCE lands, protected and enhanced as DSF habitat, when combined with the 30.5 acres of potentially restorable DSF habitat proposed for protection on the Project Site, would provide approximately 50 acres of contiguous protected potential/suitable DSF habitat in the Site vicinity.

Approximately 6+ acres is planned to be protected for DSF conservation on the Owl Company access site (Exhibit 8, Number 10). Although this area is not contiguous with the SCE property to the north, which is expected to be protected as DSF habitat, the 6$^+$ acres will contribute to a DSF conservation area in the Project Site vicinity.

There is developed land between Riverside Avenue and Industrial Avenue, which separates the 6$^+$-acre DSF habitat area on the Owl Company access site and the Project Site (Exhibit 8, Numbers 13, 14, 16). This developed land does not provide DSF habitat and does not provide a continuous habitat linkage between the Owl Access site preserve area and any potentially restorable DSF habitat on the Project Site.

TABLE 2
PROJECT SITE VICINITY PARCELS

Exhibit 8 #	Property Owner**	Acreage *	Assessors Parcel #	Current Status	DSF Habitat Value**
1	Angelus Block	96	0260-061-36 0260-061-38/1,2,3,4	Undeveloped	Generally Low (60 Acres Potentially Restorable)
2	Agua Mansa Landfill	4.97	0260-061-35	Disturbed	None
3	Agua Mansa Landfill	14.17	0260-061-33	Disturbed	None
4	SCE	9.76	0258-131-08 0258-131-09 0258-131-11 0258-131-12	Undeveloped	Medium
5	Trism/Rialto Land Co./Singletary	9.75	0258-131-21	Undeveloped	Medium
6	Sooy	3.58	0258-121-34	Disturbed	Low
7	SCE	2.76	0258-121-21	Undeveloped	Medium
8	SCE	6.6	0260-011-42	Undeveloped	Medium
9	HRM Properties	18.4	0260-021-21	Undeveloped	Low
10	Owl Company (access site)	11.37	0260-021-12	Undeveloped	Low
11	Owl Company (highly disturbed site)	217	0260-021-04 0260-021-06 0260-021-07	Developed	Low
12	Empire Oil	.5	0260-161-12 (1)	Landscaped	Low
13	Alden	.5	0260-161-12 (2)	Developed	None
14	Empire Oil	1.01	0260-161-16	Developed	None
15	Empire Oil	.5	0260-161-15	Undeveloped	Low
16	Andrews	1.00	0260-161-10	Developed	None

Exhibit 8 #	Property Owner**	Acreage *	Assessors Parcel #	Current Status	DSF Habitat Value**
17	Horn	1.00	0260-161-09	Undeveloped	Low
18	Horn	1.00	0260-161-08	Undeveloped	Low
19	Williams	1.00	0260-161-07	Developed	Low
20	Alden	1.01	0260-161-06	Undeveloped	Unknown
21	Yoon	.75	0260-161-05	Undeveloped	Unknown
22	Singletary	.76	0260-161-04	Developed	None
23	Yoon	.75	0260-161-03	Undeveloped	Unknown
24	Singletary	.76	0260-161-02	Developed	None
25	Cummins	5.13	0260-161-01	Developed	None

* Acreage from Assessors Parcel Maps, not field verified
** As of Spring 1998

There is also undeveloped land between Riverside Avenue and Industrial Avenue, which separates the 6^+-acre DSF habitat area on the Owl Company access site and the Project Site (Exhibit 8, Numbers 12, 15). This undeveloped land does not provide DSF habitat: it is largely underlain by non-Delhi Sands soil (USDA 1980) (see Exhibit 4); and contains ruderal weedy, non-native vegetation. The undeveloped land is also separated from the Owl Company access site and the Project Site by Riverside and Industrial Avenues, fragmenting a potential habitat linkage. Thus, this undeveloped land does not provide a continuous habitat linkage between the Owl Access site preserve area and any potentially restorable DSF habitat on the Project Site.

A continuous habitat connection between the Owl Access site preserve area and the Project Site could be provided by a corridor of DSF habitat across the 18.4-acre HRM property (Exhibit 8, Number 9) linking the SCE easement to the north with the Owl Access site. The HRM property currently contains largely ruderal vegetation dominated by non-native plants, but does contain some remnant native plants. The HRM site contains Delhi Sands soils (USDA 1980), and is thus potentially restorable as DSF habitat.

With these other potential DSF conservation areas a contiguous DSF conservation area could be assembled by connecting the approximately 30.5-acre Project Site Conservation Area, the 19-acre SCE easement properties, approximately 5 acres of 18.4-acre HRM property, and the 6^+-acre DSF preserve area on the Owl Access site. The contiguous DSF conservation area would comprise approximately 62 acres. Establishment of this potential conservation area would be aided significantly by dedication and enhancement of the 30.5-acre Conservation Area on the Project Site.

The Proposed Action will remove approximately 43 acres of potentially restorable DSF habitat. Implementation of the HCP however, will enhance the survival and recovery of the DSF by permanently preserving approximately 30.5 acres of potentially restorable habitat for DSF, providing for enhancement opportunities for the area to benefit the DSF, and providing an endowment for the annual maintenance and adaptive management of the habitat for the DSF in perpetuity in an area expected to offer long-term conservation value for the DSF.

An Implementing Agreement will be executed between the USFWS and Applicants to assure funding for and successful implementation of the HCP.

SECTION 4
CONSERVATION PLAN

The overall goal of this HCP is to enhance and protect potential habitat for the DSF in the Conservation Area in perpetuity and to enable the DSF to utilize the Conservation Area for long-term survival of the species. To accomplish this goal, the HCP sets the following objectives to be achieved during the life of the Permits.

1. Set aside and protect in perpetuity approximately 30.5 acres of potential habitat in the northern portion of the Project Site as a Conservation Area for DSF as shown in Exhibit 7..

2. Enhance and maintain the habitat value of the Conservation Area for DSF over the entire Conservation Area, by controlling human access, and debris, and removing non-native plants. Measurable performance standards for enhancement and maintenance of the Conservation Area will be identified in the enhancement/restoration plan prepared by the conservation organization/land manager and approved by the USFWS.

3. Increase the number of DSF on the Conservation Area such that a population of DSF can be sustained upon expiration of the Permits.

4. Establish a nonwasting endowment sufficient to generate at least $10,000/year in perpetuity for the: (1) ongoing maintenance, adaptive management, enhancement, and monitoring of the Conservation Area, (2) reporting of these activities, and (3) to respond to changed circumstances in the Conservation Area.

Specifically:

1. Angelus Block will redesign the proposed Angelus Block paver plant facility to relocate this facility to Lots 4-10. Angelus Block will redesign its block plant to utilize a smaller portion of Lot 1, thereby allowing approximately 6 acres of Lot 1 to be added to the Conservation Area. Lots 16-22 will also be made part of the Conservation Area, thereby maximizing the amount of conserved acreage in the area biologically preferred according to the USFWS.

2. The Permit Applicants will designate approximately 30.5 acres of the site (as depicted in Exhibit 7) as a Conservation Area for the DSF. The Conservation Area constitutes the best location on the Site for enhancement restoration measures to promote the long-term conservation of the DSF.

3. The Antonini Trust will dedicate fee title to the Conservation Area, at no cost, to a wildlife

conservation organization or agency or land manager which meets with the approval of the USFWS, and which will commit to managing habitat within the Conservation Area to benefit the DSF. Concurrent with the issuance of the Section 10(a) Permits and prior to any ground disturbance on Lots 1, 2, or 3, the Conservation Area will be restricted in perpetuity by legal instrument, such as a recorded Declaration of Restrictions. This Declaration of Restrictions, or other legal instrument, will be permanent and will provide that the Conservation Area will be restricted to conservation purposes for the DSF and its habitat, and the conservation of other sensitive species which may also benefit from this land without detriment to the DSF.

4. The Permit Applicants will construct a chain link fence around the Conservation Area to prevent unauthorized access, construct a soil retention fence or wall along the southern boundary of the Conservation Area to prevent soil loss, and perform initial weed removal in the Conservation Area and initial trash removal throughout the Conservation Area. In consultation with the USFWS, Permittees shall conduct initial weed and trash removal, where appropriate, throughout the Conservation Area within six months of the effective date. This work will be done outside the August-September adult DSF flight season. The intent of this initial activity is to provide some initial removal of non-native vegetation (such as mustard, Russian thistle, horehound) and to provide more open areas within the Conservation Area to benefit the DSF. The USFWS will identify for the Applicants the preferred plant species and recommended areas within the Conservation Area where such activity would be conducted. In consultation with the Service, the non-native vegetation removal is expected to be conducted through methods which may include hand clearing, use of weed-wackers, use of mowers, or some combination of these. The Conservation Area will be posted with signs indicating that the area is environmentally sensitive and that trespassing is prohibited

5. The Permit Applicants will establish a non-wasting perpetual maintenance endowment ("Endowment") for the benefit of the Conservation Area within 60 days of issuance of the Permits. The Endowment will provide funds for enhancement, annual maintenance, adaptive management, enhancement, monitoring, reporting and to respond to changed circumstances in the Conservation Area. The Endowment has been established at a level to account for inflation. The Endowment will be able to provide funding of at least $10,000/year in perpetuity for the Conservation Area. The management and maintenance of the Conservation Organization will include weeding of non-native plants, planting of native plants, redistribution of sand across the area, fence repair, and trash removal in perpetuity. The management and maintenance of the Conservation Area will be done by the Conservation Organization in perpetuity. Any funds not spent from the annual income from the Endowment at the end of any year will be placed in an interest-bearing Adaptive Management Account by the Permittees or the Conservation Organization managing the

Conservation Area (or an Endowment manager acceptable to the Permittees and USFWS), or invested in an alternative manner, and will be allowed to accumulate, as prudent, to be used as necessary to respond to any future Changed Circumstances and shall be used solely to maximize the Conservation Area's value for the DSF. The Conservation Organization and the USFWS will consult with one another to determine what is prudent in this regard. If, during the term of the Permits, the managing entity of the Endowment is dissolved, a new managing entity will be selected by the Permittees in consultation with and approval of the USFWS.

6. Five acres of mitigation credits within the Conservation Area will be available for purchase to mitigate for either direct impacts to DSF resulting in take of DSF, or for impacts to DSF habitat, on other properties. The mitigation credits may be sold in one-tenth acre (0.10 acre) units. Proceeds from the sale of mitigation credits would be used to help defray the Applicants' costs in establishing the Conservation Area and endowment fund. The purchase of mitigation credits from the bank will not, of itself, authorize Incidental Take for projects purchasing mitigation credits. Those projects may require independent Incidental Take authorization.

7. The Antonini Trust will construct chain-link fencing around the perimeter of the Conservation Area. The Permit Applicants will continue to maintain this fence until the Conservation Area is dedicated in fee title to a conservation organization, as detailed below.

8. The Applicants or their assigns reserve the right to further enhance or use the Conservation Area for the benefit of other future listed species provided that: (1) USFWS approves such enhancement or use of the Conservation Area, and (2) such actions would not be expected to decrease the value of the Conservation Area for the DSF. If the USFWS determines in writing that such proposed enhancement would negatively impact the DSF, the USFWS may preclude such enhancement by the Permittees.

9. The Conservation Area will be avoided during construction operations on the remaining lots of the Site. In addition, the Antonini Trust will place warning signs at appropriate locations along the fence and perimeter of the Conservation Area, informing the public that this area is protected habitat and considered off-limits to the general public, in an effort to discourage entry into the Conservation Area by unauthorized individuals.

10. Access to the Conservation Area will be limited to SCE, the City of Rialto, and the West San Bernardino County Water District. SCE will access the Conservation Area via use of the 16-foot wide access road that is within SCE's electrical transmission easement inside the Conservation Area (and such other related easement uses). The City of Rialto

and the West San Bernardino County Water District will access the Conservation Area via Lot 1, the dedicated Bunting Way, and Fortuna Way for utility maintenance. SCE, the City of Rialto, and the West San Bernardino County Water District will not receive authorization for incidental take of DSF within the Conservation Area or the Permit Area by virtue of the Applicants Section 10(a) permits. Thus, SCE The City of Rialto, and the West San Bernardino County Water District would continue to remain precluded from taking any action in the Conservation Area that would result in incidental take of any DSF in the absence of their own independent incidental take authorizations from the USFWS. Otherwise, only conservation and habitat or species restoration efforts will be permitted within the Conservation Area.

11. The Antonini Trust will contact representatives of SCE, the City of Rialto, and the West San Bernardino County Water District and explain the importance of the Conservation Area for wildlife conservation and DSF conservation and recovery in particular. The Antonini Trust will make its best efforts to obtain written acknowledgement from SCE that it will inform appropriate SCE employees of the need to keep its equipment and activities within the Conservation Area limited to the access road.

12. The Permit Applicants will consult with the Rialto Fire Department (RFD) concerning vegetation management for fuel reduction. There will be areas of non-flammable material (paved parking and roads) immediately outside the Conservation Area. The cul-de-sac immediately south of the Conservation Area will be 60 feet wide with an additional 25 feet setback south of the cul-de-sac. Parking and storage of non-flammable product is planned adjacent to the Conservation Area on the Project Site. The RFD has stated that it consults with USFWS concerning vegetation control in areas of potential DSF habitat and generally follows USFWS recommendations (Barajas pers. comm.). The RFD makes recommendations on a site-specific basis based on a site visit and discussions with property owners and the USFWS.

13. The Applicants and/or their agents will undertake the following actions during construction to minimize direct and indirect effects of construction activities on biological resources:

- If not otherwise yet installed, temporary fencing will be installed around the Conservation Area prior to commencement of construction activities, including grubbing and clearing of vegetation.

- Construction limits will be fenced or flagged and signed prior to construction activities to avoid the inadvertent disturbance of outlying areas.

- If construction activities occur during the DSF flight period, a biologist approved by USFWS will monitor the Construction Area. The monitoring biologist will have the authority to halt construction to prevent or avoid take of listed species and/or to ensure compliance with all avoidance, minimization and mitigation measures.

- Activities such as grading, stockpiling and excavating of soil, parking and storage of equipment, and ingress and egress of vehicles and personnel will not be permitted within the fenced Conservation Area and will be limited to the designated construction zones.

- The proper use and disposal of oil, gasoline, and diesel fuel will be enforced.

- All construction personnel will be take part in an education program. Construction personnel will be advised that the DSF is listed under the Act and the importance of staying out of the Conservation Area. All construction related avoidance minimization and mitigation requirements will be identified and discussed including construction limits and conservation measures.

- All trash associated with construction or personnel on the site will be properly contained and disposed.

- Construction activities that occur within a minimum distance of 50 feet from the Conservation Area will be monitored to ensure that dust accumulation on the plants is minimized.

14. The Applicants will replace any temporary fencing with permanent chain link fencing along the north, east and west boundaries of the Conservation Area within 120 days of issuance of the Permits. This work will be done outside the August-September adult DSF flight season. Provided that field experience on the Project Site demonstrates it is practicable, such chain link fencing will also use silting screens along lower portions of the fence to assist with Delhi series sand retention within the Conservation Area. Within 30 days of issuance of the Permits, Antonini Trust or Angelus Block shall provide an irrevocable letter of credit in the amount of $10,000 to ensure funding to establish a soil holding fence, wall or similar structure along the southern boundary of the Conservation Area. Antonini Trust or Angelus Block shall establish this soil holding fence, wall or similar structure along the southern boundary of the Conservation Area within one year of issuance of the Permits.

15. For lighting requirements under the Applicants' control and to the extent practicable and consistent with the needs for safety, security, and safe operation of the facilities, outdoor nighttime lighting for those facilities on those lots bordering the Conservation Area (Lots

1, 14 and 15) will be directed away from the Conservation Area to minimize detrimental impacts to DSF in the Conservation Area during the adult DSF flight season in August and September. The Applicants will consult with the USFWS in the development of the final plan for the outdoor lighting of these particular lots. The Applicants will have final decision-making authority on the design and implementation of such outdoor lighting.

16. The USFWS and Applicants will work cooperatively to find a suitable conservation organization/land manager that will monitor and maintain the Conservation Area. The endowment fund will be used to fund the activities described below:

    Three months after a Conservation Organization/land manager is identified, and approved by both the USFWS and permittees an enhancement/restoration plan prepared by the Conservation Organization with assistance from USFWS, that includes weeding, seed collection, success criteria, monitoring, etc. for the Conservation Area will be submitted to the USFWS for review and approval.

    - The Conservation Organization will conduct adult focused surveys for the DSF annually in the Conservation Area using a USFWS-approved biologist during the adult flight period. The focused surveys will begin the first flight season after the commencement of construction, but in no event prior to the year 2000. Yearly monitoring efforts will be conducted for the first 3 years and thereafter be evaluated annually by the USFWS in cooperation with the Conservation Organization to determine whether focused surveying for that year would be appropriate. All focused DSF survey results and will be provided to the USFWS within 45 days of completion of surveys.

    - The Conservation Organization will conduct monitoring at least biannually for the first 5 years. The emphasis of the monitoring effort will be to assess and report on the status of target weed species and native cover. The removal of non-native target weed species and the collection and broadcasting of native seed will be conducted. The Conservation Organization will provide the USFWS with an annual report to determine the restoration success based on the performance criteria established in the enhancement/revegetation plan.

    - Performance standards will include criteria which can be measured. Factors to be evaluated will include: (1) percent vegetation cover by strata; (2) target or management indicator species; (3) target native plant diversity and composition, (if monitoring indicates a high level of non-native plant species, corrective action will be required); (4) evidence of natural reproduction; and (5) percent survivorship.

Five-Year Maintenance and Monitoring Program: The Conservation Organization will monitor progress of the enhancement/revegetation efforts biannually to ensure that yearly performance standards are maintained. The Conservation Organization will conduct seeding or weed removal promptly to meet established performance standards, as necessary. The Conservation Organization shall keep accurate records of the following:

- Existing conditions of the Conservation Area, including descriptions of vegetation composition, weed species and erosion problems;
- Enhancement/revegetation site preparation and planting techniques utilized: seed quantities, timing, weather conditions, and any problems encountered during planting;
- Maintenance activities implemented, including methods used for weed control, timing and locations of germination for seeded species, and response of vegetation areas to changes in weather conditions;
- Qualitative and quantitative monitoring data related to performance standards;
- Remedial measures and maintenance activities required; and
- Maintenance will be completed as necessary for the five-year period in the Conservation Area. Maintenance requirements to be carried out by the conservation organization in the Conservation Area include:
  - Weed control
  - Debris and trash removal
  - Limiting human access and fence and signage repair

Reporting: The conservation organization shall submit a yearly monitoring report to the USFWS on or by December 31. The monitoring report shall provide all reasonably available data regarding the incidental take. In addition, the report will:

- Describe the progress of the enhancement/revegetation effort;
- Identify any problems encountered, detail corrective measures and evaluate their efficacy;
- Include results of species surveys; and
- Include copies of monitoring and maintenance records.

Continued Maintenance and Monitoring: At the end of the fifth year, the conservation organization shall submit a status report to the USFWS. If the enhancement/revegetation program has met the specified performance standards, the USFWS shall acknowledge the completion of the enhancement/revegetation program. If such a determination cannot be made, maintenance or re-seeding shall be prescribed and monitoring will be extended until performance criteria are met.

Long-term Maintenance: Upon completion of the five-year maintenance and monitoring period, the conservation organization shall implement a long-term maintenance program. The conservation organization shall conduct routine maintenance to maintain fencing and signage, ensure trash removal, and eliminate weed problems.

- Biannual plant surveys of Conservation Area will be conducted by the conservation organization. Photographs will be taken to document habitat conditions.
- Fencing and signage will be monitored by the conservation organization to ensure that both are maintained. Areas where signage is removed or fencing is breached will be monitored as necessary to maintain fencing and sign integrity.
- Focused DSF survey efforts will be evaluated for the long-term monitoring program by the USFWS in cooperation with the conservation organization. The agreed upon protocol will be incorporated into the long-term maintenance and monitoring plan.

An Implementing Agreement (IA) will be executed between the USFWS and the applicants to assure the implementation of the HCP.

For Covered Activities as defined in the IA, the USFWS will acknowledge to the City of Rialto, the County of San Bernardino, and any other appropriate government jurisdiction, agency or department, that the conservation and recovery activities being undertaken by Permittees pursuant to this HCP are sufficient under the Endangered Species Act to alleviate Permittees or Other Subsequent Land Purchasers as set forth in the IA (of land within the approximately 65 acres permitted for incidental take) from any additional conservation measures, biological mitigation measures, financial contributions, land donations or set asides or other land use restrictions which could be sought to be imposed on land within the Permit Area for the DSF through some other regional (i.e., single or multi-jurisdictional) species or habitat conservation plan or Natural Communities Conservation Plan (collectively, "Additional Measures"). However, the Permittees or other subsequent land purchasers are not relieved from obtaining independent incidental take authorization for any future listed species which is listed and which would be incidentally taken by a covered activity under the currently proposed permits in the Permit Area. The USFWS will not recommend that any Additional Measures be required or imposed upon land within the Project Site authorized for DSF incidental take to any government jurisdiction, agency or department, nor shall the USFWS require, recommend or impose such Additional Measures in connection with the approval of any regional species or habitat conservation plan including the Project Site in its boundaries, except as required by law. The Permittees or other subsequent land purchasers will not be precluded from enrolling their ownership of land in the Project Site in some other species or habitat conservation plan as well; provided that such landowner agrees to contribute any necessary additional mitigation for any additional incidental take authority for species in addition to the DSF. The USFWS will fully credit Permittees or other subsequent land purchasers for the biological contribution made for the benefit of listed species in addition to the DSF, if any, for species proposed to be covered under a regional species or habitat plan, in connection with the Permit's HCP when considering whether the Project

Site, or a portion thereof, may also be included in any future conservation plan which may provide incidental take authority for more species than the DSF.

The Permit Applicants have entered into a Consent Decree with the United States pertaining to litigation between Permit Applicants and the United States government concerning activity on the Project Site and its potential for the take of the DSF. This Consent Decree was approved by the United States District Court for the Central District of California in June 1999. Under the terms of that Consent Decree, the Permit Applicants have committed to conduct certain measures to promote the recovery and conservation of the DSF, and in return, the United States government has agreed that certain activities may proceed on a portion of the Project Site without further objection from the federal government. Conservation measures on the Project Site provided for under the Consent Decree include fencing the proposed approximately 30.5 acre Conservation Area, avoiding impacts to the proposed Conservation Area during construction activities on certain Lots outside the Conservation Area, placing a deed restriction for DSF conservation purposes on a portion of the Project Site (including Lots19-22 and the formerly proposed Bunting Drive) and providing biological monitoring of construction areas to minimize any take of DSF if such construction activity is occurring during the 1999 DSF flight season. (The USFWS prepared a Biological Opinion to analyze the potential for take in connection with development on Lots 11-15 and Lots 4-10 under the Consent Decree as well as the mitigation and benefits associated with the conservation measures required by the Consent Decree.) This HCP, the associated Implementing Agreement, the Permits and the associated Biological Opinion, if approved by the Service, will replace the terms and conditions of the Consent Decree and its associated Biological Opinion.

MIGRATORY BIRD TREATY ACT

The Applicants recognize that the Section 10(a) Permits, should they be issued by the Service, do not relieve the Applicants from assuring compliance with thee Migratory Bird Treaty Act ("MBTA"). The Applicants will conduct grading or clearing activities within the Permit Area in compliance with the requirements of the MBTA.

RESPONSE TO UNFORESEEN CIRCUMSTANCES

Provisions for addressing unforeseen circumstances generally are required for long-term permits and HCP programs. (See H.R. Rep. No. 97-835, 97th Cong., 2nd Sess.). Such provisions are appropriate and required where the applicant and USFWS are likely to be faced with changing circumstances during the course of the project or with respect to impacts on the affected species over time. Under the USFWS's recent "No Surprises" rule, any such provisions may not require the Applicants to commit additional land, water, or financial compensation or additional restrictions on the use of land, water, or other natural resources beyond the level otherwise agreed upon in this HCP: provided that the HCP is properly implemented.

It is not likely that the Applicants or the USFWS will be faced with unforeseen circumstances requiring such provisions, inasmuch as: the area of development associated with this project is relatively small (approximately 65 acres); a portion of this Site is expected to be developed within the first year of the Permit; the area of development does not lie within a significant biological corridor for the DSF; the developable land under this HCP currently does not constitute generally suitable habitat for the DSF; and, the amount of take of DSF is expected to be low.

Nevertheless, Section 16.0 of the IA contains provisions for dealing with unforeseen circumstances.

RESPONSE TO CHANGED CIRCUMSTANCES

As necessary and appropriate, an HCP conservation program may include conditional conservation and mitigation measures to be effectuated in the event of the occurrence of reasonably foreseeable "changed circumstances" specifically identified in the Plan. 50 C.F.R. §17.22(b)(5)(i). USFWS regulations define the "changed circumstances" that an HCP may address in this context as "changes in circumstances affecting a species or geographic area covered by a conservation plan that can reasonably be anticipated by plan developers and the Service that can be planned for (e.g., the listing of new species, or a fire or other natural catastrophic event in areas prone to such events)." 50 C.F.R. §17.3.

Given this regulatory framework, four categories of potential "Changed Circumstances" related to the DSF or Project Site that reasonably may be anticipated during the term of the permits bear mention: (1) changes to the vegetative cover or other geophysical conditions on the Site (including those arising from potential periods of drought or excessive rainfall in the HCP area, significant fires within on-Site areas containing Delhi Sands soils, etc.); (2) changes concerning the DSF (including accelerated decline in the number of extant DSF populations or the size of one or more such populations, the future use or occupation of the Conservation Area by DSF, etc.); (3) a further significant reduction in the number of acres of Delhi Sands soils in San Bernardino and Riverside Counties; and (4) listing under the ESA of other species that occur on the Site.

Responding to changed circumstances related to conditions on the Site can be accomplished by adaptively managing the Conservation Area to maximize DSF conservation objectives with the annual proceeds of the endowment fund to be established pursuant to the Proposed Action. Indeed, the flexibility to carry out such "adaptive management" of the Conservation Area should only increase over time, as costs of affirmative measures necessary to monitor and maintain the Conservation Area as suitable habitat should gradually decline after the first 3-5 years. The annual proceeds from the endowment have been set at a level which will produce proceeds which will accumulate over time in a sub-account which will be established to address changed circumstances through adaptive management of the Conservation Area. This approach is particularly well suited to deal with reasonably foreseeable changes to on-Site conditions. For example, in the event fire broke out within the Conservation Area, endowment fund proceeds could be used to revegetate the Conservation Area with native species associated with DSF habitat, thereby providing greater certainty that the Conservation Area would be able to more quickly return to suitable habitat than if natural recolonization were allowed to occur.

If the changed circumstances relate to DSF viability (e.g., a further decline in the number of extant DSF populations or the size of one or more such populations), the Permit Applicants would allow DSF to be introduced within the Conservation Area, but the USFWS would provide adequate assurances to the Applicants that they would not be prejudiced by such introduction (e.g., presence of introduced DSF on the Site would not lead to liability or increased regulatory constraints under the ESA or any other law or regulation). In addition, pursuant to the IA, the Permittees are providing the USFWS with the right of first refusal to buy the Delhi Sands soils, if any, that the Permittees intend to export from the Project Site while preparing lots for development. The USFWS would have thirty days from the date of offer to purchase such soils. Should the DSF's status in the Colton Recovery Unit area worsen to the point of becoming extirpated from the area, funds in the aforementioned adaptive management/changed circumstances sub-account of the endowment fund established by the Proposed Action may be utilized in a captive breeding effort. Moreover, even if any such adverse changes to DSF viability occurred, at least to a reasonably anticipated degree, the Proposed Action is not likely to jeopardize the continued existence of the DSF because (1) to the extent the Site is occupied by DSF, any such occupation is minimal (only four DSF observations on a single day in four years of surveys); and (2) the only area of DSF observation has been placed in the Conservation Area, (3) completion of the Proposed Action will result in a Site that has far superior potential than does the status-quo for both eventual, regular use of the Site by DSF and for making a contribution to long-term DSF recovery.

The preamble to the No Surprises Rule states that the listing of a new species as endangered or threatened, which species occupies the Permit Area, may constitute a changed circumstance. The USFWS shall immediately notify Permittees upon becoming aware that a species which is associated with habitat found on the Permit Area may be or has been proposed for listing. Upon receipt of notice of the potential listing of such species, Permittee(s) or other subsequent land purchasers may, but is/are not required to, enter into negotiations with USFWS regarding necessary modifications, if any, to the HCP required to amend the

Permit(s) to cover the covered species. If Permittee(s) or other subsequent purchasers of land on the Project Site elect(s) to pursue amendment of the applicable Permit, the USFWS will provide technical assistance to Permittee(s) or other subsequent land purchasers to identify any modifications to the HCP that may be necessary to amend the applicable Permit. Paragraph 15.3 of the IA provides more details of the process to be followed in the event of Changed Circumstance and the response to such events. Under either scenario, the Applicants will be granted credit for the conservation value for any newly listed species that has arisen from the establishment and management of the Conservation Area and may seek to have future management of the Conservation Area be modified to benefit the new species (1) if approved by the USFWS and (2) if such modifications would not be expected to meaningfully decrease the value of the Conservation Area for DSF.

SECTION 5
ALTERNATIVE ACTIONS CONSIDERED

Pursuant to 50 C.F.R. Section 17.22(b)(1)(iii)(C), the applicant is to identify in the HCP the alternatives considered to the Proposed Action and the reason why such alternatives were not selected. The alternatives to the Proposed Action (i.e., obtaining Section 10(a) permits and proceeding with development and operation of industrial or other facilities on approximately 65 acres and donating approximately 30.5 contiguous acres of the property for DSF recovery and conservation purposes in the AMEZ area and providing an endowment fund to provide funds for annual maintenance, adaptive management, and to respond to changed circumstances in the Conservation Area in perpetuity) are: (1) abandonment of the industrial facility projects (the "No Project" alternative), (2) abandonment of the industrial facility projects and establishment of a DSF habitat mitigation bank, (3) redesign of some industrial facility projects and establishment of a 24-acre Conservation Area and a habitat mitigation bank within a portion of a dedicated Conservation Area, (4) completion of the industrial facility projects without Section 10(a) permits and HCP (the "No Action" alternative), (5) participation in the AMIGA HCP or San Bernardino Valley-wide Multiple Species Plan, (6) Development of 83 Acres, dedication of a 13.4 Acre Conservation Area, habitat restoration and providing an Endowment Fund for maintenance and management of the Conservation Area, and (7) the Proposed Action.

ALTERNATIVE 1: NO PROJECT

Under this alternative the Angelus Block facilities (the block and paver plants) and the E-Z Mix East Complex would not be constructed on the Site. Nor would the remaining lots be used for other industrial uses or sold to other industrial users.

Under this alternative, the 96-acre Site would remain subject to various forms of human disturbance. Trampling, illegal trash and other dumping and ORV disturbance could negatively impact areas of potentially restorable DSF habitat on the Site. No measures would be taken by the Applicants to secure and enhance or restore any portion of the Site for recovery or conservation of the DSF. Non-native, invasive plant species would continue to dominate the Site

The Antonini Trust purchased the Site in 1989 for industrial uses. The market price paid reflected the zoning of the property for industrial uses. Since the purchase date, the Applicants have spent considerable sums to complete the local entitlements, satisfy the conditions for final map recordation, design the Angelus Block facilities, and satisfy the property tax burden on the Site. Abandonment of the industrial development of the Site would therefore be impracticable and uneconomical in terms of the Applicants realizing their reasonable expectations for the improved Site and community benefits as well as providing an adequate economic return against their considerable costs and expenses.

ALTERNATIVE 2: PROJECT ABANDONMENT AND ESTABLISHMENT OF A DSF MITIGATION BANK ONSITE

Establishment of a DSF habitat mitigation bank on the Site would eventually result in approximately 73 acres of potentially restorable DSF habitat. The success of the mitigation area would be dependent on funding and conservation efforts of others. The certainty of these efforts is not known.

In four years of focused surveys DSF have been observed on one day on the Project Site, and the Site generally provides unsuitable habitat for the DSF in its current disturbed condition.

The market for mitigation bank acreage to offset impacts to DSF is largely unknown. There are no reasonable assurances that the 73-acres of potential mitigation bank credits could produce enough economic return to be a profitable alternative for the Applicants. Furthermore, this alternative would not meet the Applicants' need for a suitable location for the Angelus Block manufacturing facilities.

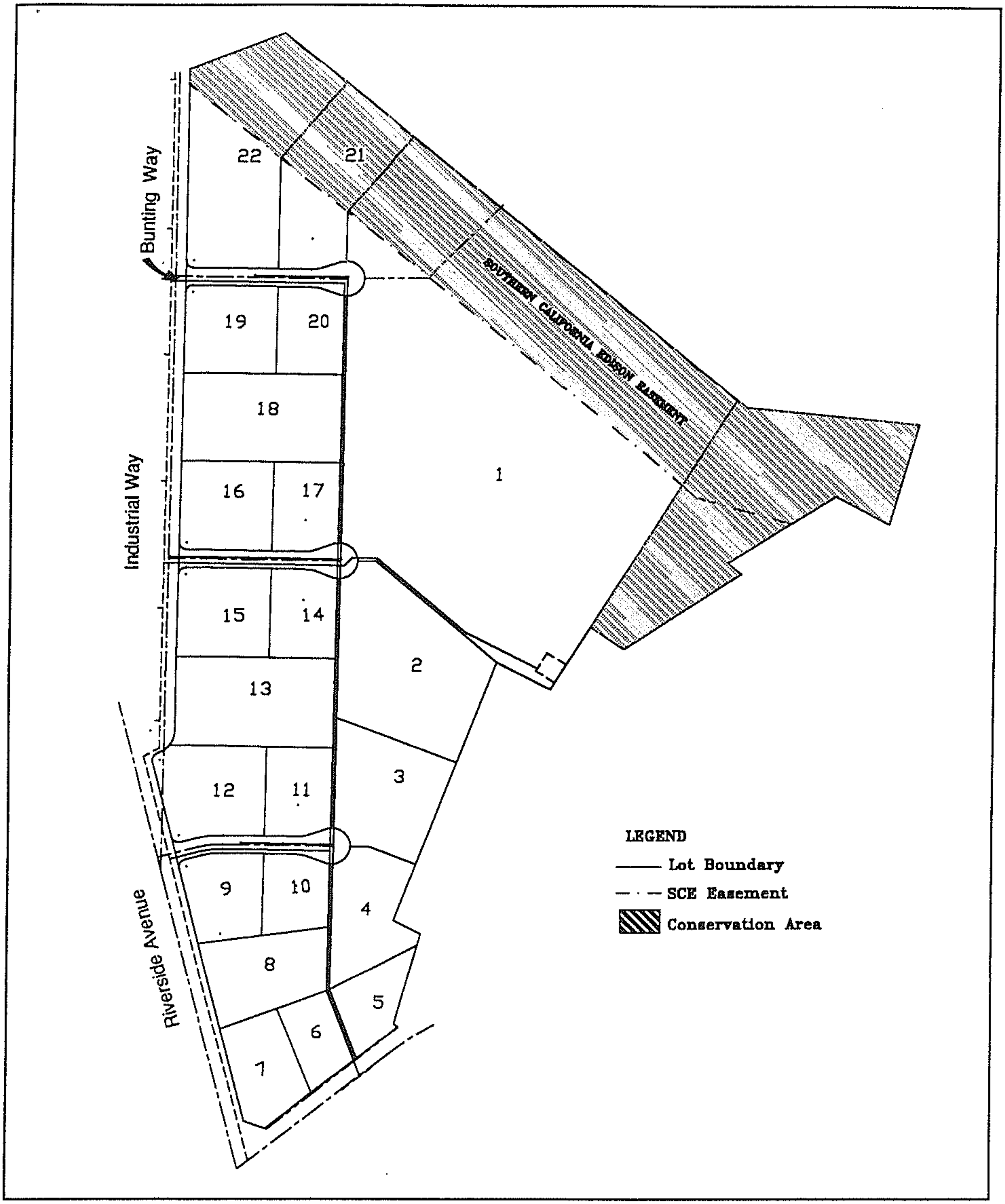
ALTERNATIVE 3: REDESIGN OF SOME OF THE INDUSTRIAL FACILITY PROJECTS AND ESTABLISHMENT OF A CONSERVATION BANK WITHIN A PORTION OF A CONSERVATION AREA

This was the original proposed action under consideration by the Applicants prior to discussions with USFWS in early 1998 and subsequent redesign of the project.

This alternative would identify a 24-acre Conservation Area within the Site, and would dedicate 10 acres of the Conservation Area at no cost. The Conservation Area would consist of approximately 24 acres and would be located along the entire northern/northeastern boundary of the Site, extending from Industrial Drive to Agua Mansa Road on the southeast and include the eastern 8.4-acre parcel (Exhibit 9). This alternative would also establish a DSF conservation mitigation credit bank on the remaining 14 acres within the Conservation Area. This alternative would entail the redesign of the anticipated block plant on Lot 1.

This alternative would provide less total acreage in the Conservation Area than the Proposed Action, and would provide a lower level of conservation benefit to the DSF compared with the Proposed Action. Under this alternative, the long narrow Conservation Area would not minimize "edge effects," would contain land in the bluff area on the south of the Site that is more distant from other land being considered by others for DSF conservation areas, and would not contain the land further west on the Site (portions of Lots 21 and 22 south of the SCE easement) which the USFWS considers more valuable for the DSF.

Alternative 3 would also differ from the Proposed Action in that it would (1) allow the Applicants to suffer less of an economic hardship by virtue of the Applicants' voluntary conservation efforts, and (2) allow Angelus Block to maintain the paver plant at its originally designed location on Lots 21 and 22.



Michael Brandman Associates

Exhibit 9

Alternative 3 Proposed Conservation Area

20620002 • 6/99

ANTONINI TRUST / ANGELUS BLOCK • DELHI SANDS FLOWER-LOVING FLY HCP/EA

This alternative was not selected because the USFWS has indicated that it would not issue Incidental Take Permits to the applicants based on this HCP design.

ALTERNATIVE 4: PROJECT COMPLETION WITHOUT A SECTION 10(A) PERMIT (THE "NO ACTION" ALTERNATIVE)

This alternative provides for the Applicants to proceed with project completion without obtaining a Section 10(a) permit authorizing incidental take of the DSF. The applicants believe that this alternative is available inasmuch as the Project Site may not contain DSF or any other listed species, and thus the development of the Site may not result in "take" under the ESA. Focused surveys conducted over three consecutive years (1995-1997) indicated that DSF do not occur on Site. USFWS policy provides that a site is to be considered unoccupied by the DSF if two years of properly conducted DSF surveys yield no DSF observations. Focused DSF surveys in 1998 revealed four observations on a single day. No observations were made on any other day, during a year that has been postulated as being an optimal year for DSF observations. The location of these observations and lack of observations elsewhere suggest that these individuals may have migrated from another site. Also, it is certain that the individuals observed did not survive after September 1998, and it is not known whether any female successfully oviposited any eggs in onto the soil and whether any such eggs would remain viable at this time. Although USFWS might assert that the August 27, 1998 observations established that at least a small portion of the project site is occupied, such occupation is speculative and cannot be established. Accordingly the Applicants believe that they may legally proceed to develop the Site without a Section 10(a) Permit from USFWS. Under this alternative, the Applicants would not provide approximately 30.5 acres in the northern portion of the Site to be used for DSF mitigation. Under this alternative, no potentially restorable DSF habitat would be protected. This alternative was not selected because the applicants believe a more timely and long-term resolution of land use issues can be achieved via the Proposed Action rather than proceeding without a Section 10(a) permit.

ALTERNATIVE 5: PARTICIPATION IN AMIGA HCP OR SAN BERNARDINO VALLEY-WIDE MULTIPLE SPECIES PLAN

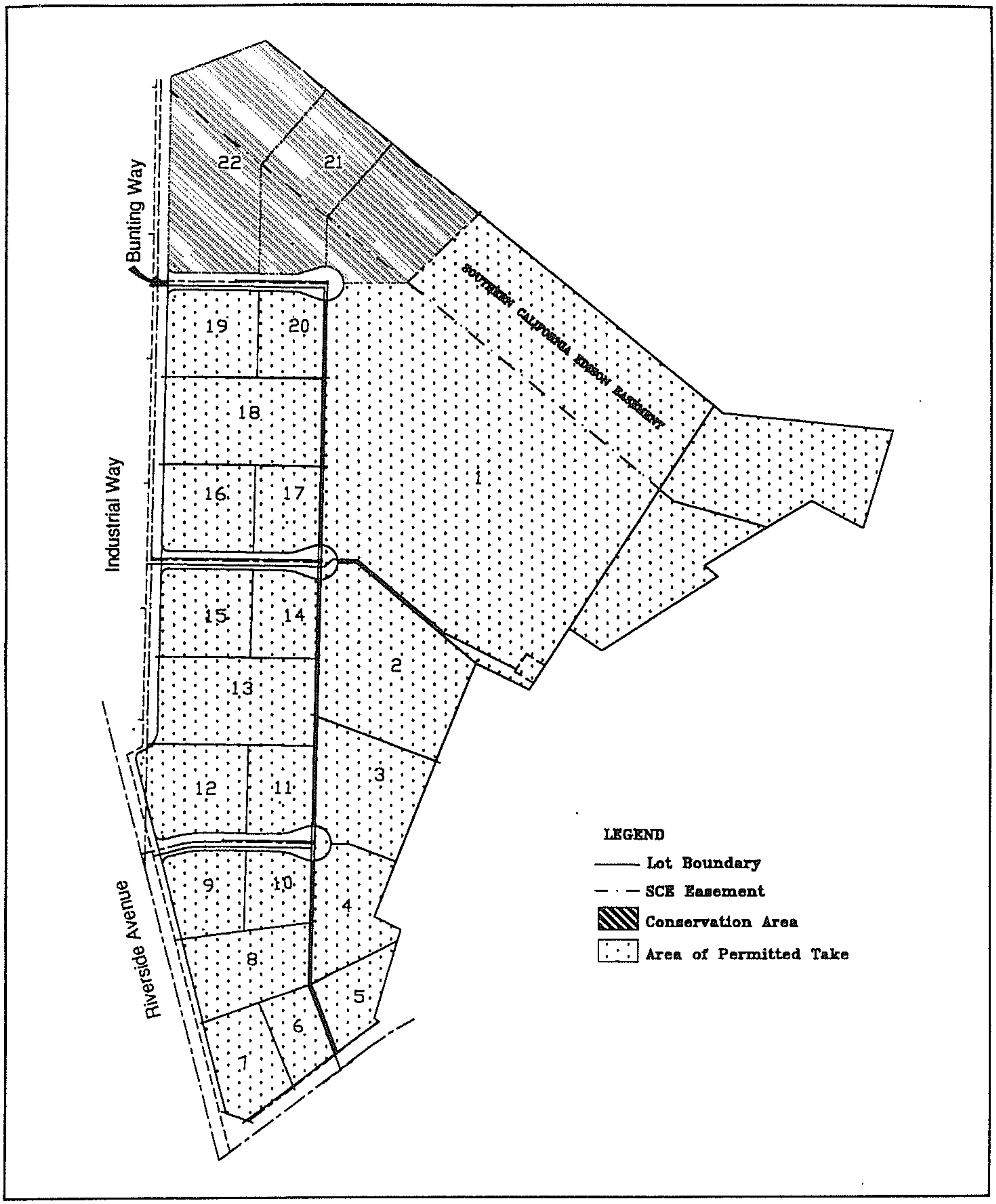
Under this alternative, the Applicants would mitigate for any take of the DSF by participating in a larger HCP plan area established by either the AMIGA or a collection of local jurisdictions under a multi-species HCP for a portion of San Bernardino County, as opposed to their own site-specific HCP. This alternative was rejected, as there is no alternative HCP program in place and neither the AMEZ nor the relevant local jurisdictions in San Bernardino County are likely to establish a program that would be available to the Applicants within the foreseeable future.

ALTERNATIVE 6: DEVELOPMENT OF 83 ACRES, DEDICATION OF A 13.4 ACRE CONSERVATION AREA, HABITAT RESTORATION AND PROVIDING AN ENDOWMENT FUND FOR CONSERVATION MAINTENANCE AND MANAGEMENT

This alternative consists of proceeding with development pursuant to the approved existing entitlements, and obtaining Section 10(a) permits for incidental take of the DSF. This alternative would result in construction within potentially restorable habitat for the DSF. This alternative would dedicate a 13.4-acre Conservation Area to a conservation organization at no cost, and additionally would restore habitat for DSF in the Conservation Area and provide a maintenance endowment in perpetuity for the Conservation Area. The Conservation Area would be located in the most valuable location on the Site for the future recovery and conservation of the DSF. See Exhibit 10. The Conservation Area would be used for the recovery and conservation of the DSF. This alternative would result in construction within approximately 60 acres of potentially restorable DSF habitat. This alternative was not selected because the USFWS has indicated that it would not issue Incidental Take Permits to the Applicants based on this HCP design.

ALTERNATIVE 7: PROPOSED ACTION

This alternative would dedicate an approximately 30.5-acre Conservation Area in the northern portion of the Site that would be transferred in fee title to a conservation or wildlife organization or agency at no cost, to be used to promote the conservation of the DSF (see Exhibit 7). The paver plant, originally redesigned to Lots 16-20, will be redesigned again to be located on Lots 4-10. Lots 16-20 will be added to the Conservation Area. The originally planned Bunting Drive will be eliminated as a paved road and cul-de-sac, and this area will become part of the Conservation Area. The block plant will also be redesigned so that an additional approximately 6 contiguous acres can be added to the Conservation Area. An endowment fund would be established by the Applicants, the annual proceeds of which would be used for habitat enhancement and ongoing maintenance, adaptive management, enhancement, monitoring, reporting and to respond to changed circumstances in the Conservation Area, in perpetuity. The Applicants would also fence the Conservation Area to prevent unauthorized access, construct a solid fence along the southern boundary of the Conservation Area to prevent soil loss, and perform initial weed and trash removal. This alternative would result in construction in approximately 43 acres of potentially restorable DSF habitat.



Michael Brandman Associates

Exhibit 10

Alternative 6 Proposed Conservation Area

20620002 • 6/99

ANTONINI TRUST / ANGELUS BLOCK • DELHI SANDS FLOWER-LOVING FLY HCP/EA

SECTION 6
OTHER MEASURES

Section 10(a)(2)(A)(iv) of ESA provides that an HCP should include any additional measures required by the Secretary of the Interior as being necessary or appropriate for purposes of the HCP. The Applicants have discussed the proposed elements of this conservation plan with the USFWS, and no such additional elements have been identified.

SECTION 7
ORGANIZATIONS AND INDIVIDUALS CONSULTED

Agencies and persons consulted during the course of preparing this HCP are listed below.

U.S. FISH AND WILDLIFE SERVICE

Jon Avery, Carlsbad USFWS Office, Carlsbad, California
Jim Bartel, Carlsbad USFWS Office, Carlsbad, California
Laura Hill, Portland Regional Office, Portland, Oregon
Jeffery M. Newman, Carlsbad Field Office, Carlsbad, California
Mary Beth Woulfe, Carlsbad Field Office, Carlsbad, California

CITY OF RIALTO

Norma Barajas, Rialto Fire Department, Rialto, California

OTHER INDIVIDUALS

Kim Gould, Southern California Edison (SCE)
Dan Pearson, Southern California Edison (SCE)

SECTION 8
REPORT PREPARATION PERSONNEL

The individuals listed below were responsible for preparation of this HCP.

NAME	**RESPONSIBILITY**	**COMPANY AFFILIATION**
Michael Brandman, Ph.D.	Principal-in-Charge	Michael Brandman Associates
Larry D. Munsey	Entomologist	Larry Munsey International
Andrew Hartzell	Attorney-at-Law	Hewitt & McGuire, LLP
Gregg B. Miller	Senior Scientist	Michael Brandman Associates
Carey Cramer	Graphic Artist	Michael Brandman Associates

SECTION 9
REFERENCES

Ballmer, G. 1989. Petition to the U.S. Fish and Wildlife Service to List *Rhaphiomidas terminatus abdominalis* as Endangered. 11 pp.

Ballmer, G. 1992. Petition to the U.S. Fish and Wildlife Service for Emergency Listing of *Rhaphiomidas terminatus abdominalis* as an Endangered Species. 2 pp.

Barajas, Norma, Rialto Fire Department, Fire Prevention Division. January 22, February 4, May 4 1998. Telephone conversations with Gregg Miller.

California Department of Fish and Game (CDFG). 1991. California Wildlife Habitat Relationships Database System. The Resources Agency of California. Sacramento, California.

California Department of Fish and Game (CDFG). 1996a. Special Plants List. California Department of Fish and Game, Natural Diversity Data Base. The Resources Agency of California. Sacramento, California. 111 pp.

California Department of Fish and Game (CDFG). 1996b. Endangered, Threatened, and Rare Plants of California. The Resources Agency of California. Sacramento, California. 14 pp.

California Department of Fish and Game. 1997. RareFind 2 personal computer program. Data Base Record Search for Information on Threatened, Endangered, Rare, or Otherwise Sensitive Species for the Corona Fontana, and San Bernardino South California USGS Topographic Quadrangles. . California Department of Fish and Game, State of California Resources Agency. Sacramento, California.

Cazier, M.A. 1985. A Revision of the North American Flies Belonging to the Genus *Apiocera* (Diptera, Apioceridae). Bull. Amer. Mus. Nat. Hist. 182:181-263.

ENSR, 1995. Environmental Assessment for the Issuance of an Incidental take Permit Under Section 10(A)(1)(B) of the Endangered Species Act for the Endangered Delhi Sands Flower-loving Fly Colton Transmission Line and Substation Project by the City of Colton. Prepared for the U.S. Fish and Wildlife Service. Prepared by ENSR Consulting and Engineering.

ENSR, 1997. Biological and Cultural Resource Evaluation Report Visy Project. Prepared for the City of Colton, Colton California.

FH&A, 1994. Report of Survey for Delhi Sands Flower-loving Fly (*Rhaphiomidas terminatus abdominalis*) and Other Sensitive Species on Inland Empire Composting Property, Colton, San Bernardino County, California.

Kiyani Environmental Consultants. 1995. Principal Investigator's Annual Report Delhi Sands Flower-loving fly (*Rhaphiomidas terminatus abdominalis*) Studies at Colton, California. 25+ pp.

Kiyani Environmental Consultants. 1996a. Principal Investigator's Second Annual Report Delhi Sands Flower-loving Fly (*Rhaphiomidas terminatus abdominalis*) Studies at Colton, California. Prepared for San Bernardino County and U.S. Fish and Wildlife Service, Carlsbad, California. 14+ pp.

Kiyani Environmental Consultants. 1996b. Principal Investigator's Third Annual Report Delhi Sands Flower-loving Fly (*Rhaphiomidas terminatus abdominalis*) Studies at Colton, California Fly Year 1996. Prepared for San Bernardino County and U.S. Fish and Wildlife Service, Carlsbad, California. 11+ pp.

Kiyani Environmental Consultants. 1997. Principal Investigator's Fourth Annual Report Delhi Sands Flower-loving Fly (*Rhaphiomidas terminatus abdominalis*) Studies at Colton, California Fly Year 1997. Prepared for San Bernardino County and U.S. Fish and Wildlife Service, Carlsbad, California. 24+ pp.

Larry Munsey International, (LMI) 1997. Report Of 1997 Surveys For The Delhi Sands Flower-Loving Fly On Angelus Block Company 90-Acre Parcel In The City Of Rialto San Bernardino County, California. Prepared for Hewitt & McGuire.

Michael Brandman Associates (MBA). 1995. Delhi Sands Flower-loving Fly Survey Report for the Rialto Property. Prepared for Hewitt & McGuire. 6 pp. + Appendix.

Michael Brandman Associates (MBA). 1996. Report of 1996 Surveys for the Delhi Sands Flower-loving Fly on the Angelus Block Company Property in the City of Rialto, San Bernardino County, California. Prepared for Hewitt & McGuire. 4 pp. + Appendix.

Remsen, J.V. 1978. Bird Species of Special Concern in California: An Annotated List of Declining or Vulnerable Bird Species. Non-game Wildlife Investigations. Wildlife Management Branch, California Department of Fish and Game. Administrative Report, No. 78-1.

Riggan and Associates. 1996. "Report of a Two Year Survey of an Eleven Acre Parcel for the Delhi Sands Flower-loving Fly, Rialto, California. Prepared for The Owl Companies. 9 pp. + tables and figures.

Rogers, R. and R. Mattoni. 1993. Observations on the Natural History and Conservation Biology of the Giant Flower-loving Flies, *Rhaphiomidas* (Diptera: Apioceridae). Dipt. Res. 4(1-2):21-34.

Sawyer, J. 1994. Series Descriptions of California Vegetation. California Department of Fish and Game. Sacramento, California.

Skinner, M.W., and B.M. Pavlik. 1994. *California Native Plant Society's Inventory of Rare and Endangered Vascular Plants of California*. California Native Plant Society. Special Publication, No. 1, 5th ed.

Thomas Olsen Associates Inc., 1996. Results and Analysis of the 1996 Delhi Sands Flower-loving Fly Survey for the Agua Mansa Industrial Center. Prepared for Lowe Enterprises and The Keith Companies.

Thomas Olsen Associates Inc., 1997. Initial Study Colton/San Bernardino Regional Tertiary Treatment and Water Reclamation Authority (JPA) Infiltration Rate, Enhancement Project, Colton, California. Prepared for Colton/San Bernardino JPA.

Tierra Madre Consultants, 1997. Focused Surveys for the Delhi Sands Flower-loving Fly. Prepared for Santa Fe Pacific Pipeline Partners L.P. for Submittal to U.S. Fish and Wildlife Service.

U.S. Department of Agriculture, Soil Conservation Service (USDA). 1971. Soil Survey: Riverside County. U.S. Govt. Printing Office, Washington, D.C.

U.S. Department of Agriculture, Soil Conservation Service (USDA). 1980. Soil Survey of San Bernardino County Southwestern Part, California.

U.S. Fish and Wildlife Service (USFWS). 1993. Endangered and Threatened Wildlife and Plants; Determination of Endangered Status for the Delhi Sands Flower-loving Fly. U.S. Department of the Interior. *Fed. Reg.* 58(183): 49881-49887.

U.S. Fish and Wildlife Service, 1994a. Letter to Mr. Leon Long, West San Bernardino County Water District, dated November 4, 1994.

U.S. Fish and Wildlife Service 1994b. Endangered and Threatened Wildlife and Plants; Animal Candidate Review for Listing as Endangered or Threatened Species. Federal Register 50 CFR Part 17. U.S. Department of the Interior. Washington, D.C.

U.S. Fish and Wildlife Service. 1995 (July). Delhi Sands Flower-loving fly (*Rhaphiomidas terminatus abdominalis*; DSF) Draft Presence/ Absence Survey Guidelines.

U.S. Fish and Wildlife Service, 1996a. Letter to G.W. Singletary, dated September 17, 1996.

U.S. Fish and Wildlife Service (USFWS). 1996b. Interim General Survey Guidelines for the Delhi Sands Flower-loving Fly. 4 pp.

U.S. Fish and Wildlife Service (USFWS), 1996c. Intra-Service Section 7 Consultation on Entering into a Memorandum of Understanding between the U.S. Fish and Wildlife Service and Agua Mansa Industrial Growth Association (1-6-97-F-12). U.S. Fish and Wildlife Service, Carlsbad, California.

U.S. Fish and Wildlife Service (USFWS). 1996d. U.S. Listed Vertebrate Animal Species Index By Lead Region and Status as of September 30, 1996.

U.S. Fish and Wildlife Service (USFWS). 1997. Delhi Sands Flower-loving Fly (*Rhaphiomidas terminatus abdominalis*) Recovery Plan. U.S. Fish and Wildlife Service, Portland, OR. 51pp.

Williams, D.F. 1986. Mammalian Species of Special Concern in California. Non-game Wildlife Investigations, Wildlife Management Branch, California Department of Fish and Game. Administrative Report, No. 86-1.

Woulfe, Mary Beth, U.S. Fish and Wildlife Service. Telephone Conversation June 24, 1999.

RESOLUTION NO. 2021-XX

A RESOLUTION OF THE PLANNING COMMISSION OF THE CITY OF RIALTO, CALIFORNIA ADOPTING A MITIGATED NEGATIVE DECLARATION (ENVIRONMENTAL ASSESSMENT REVIEW NO. 2020-0008) FOR A PROJECT CONSISTING OF THE DEVELOPMENT AND OPERATION OF A CONCRETE BLOCK MANUFACTURING FACILITY ON 32.48 GROSS ACRES OF LAND (APNS: 0260-061-41, -42, & -67) LOCATED AT THE TERMINUS OF FORTUNA WAY APPROXIMATELY 525 FEET EAST OF INDUSTRIAL DRIVE WITHIN THE HEAVY INDUSTRIAL (H-IND) LAND USE DISTRICT OF THE AGUA MANSA SPECIFIC PLAN.

WHEREAS, the applicant, Angelus Block Co., Inc., proposes to develop and operate a concrete block manufacturing facility ("Project") on 32.48 gross acres of land (APNs: 0260-061-41, -42, & -67) located at the terminus of Fortuna Way approximately 525 feet east of Industrial Drive within the Heavy Industrial (H-IND) land use district of the Agua Mansa Specific Plan ("Site"); and

WHEREAS, the Project will consist of the construction of a 135,581 square foot manufacturing plant building, a 10,018 square foot administration building, a 21,360 square foot mechanic shop/storage building, a 21,534 square foot metal canopy structure, sixty-nine (69) parking spaces, paving, landscaping, lighting, fencing, and drainage improvements on the Site; and

WHEREAS, pursuant to Table 8 (Permitted Uses) of the Agua Mansa Specific Plan, the operation of a concrete block manufacturing facility on the Site is a use permitted by right; and

WHEREAS, the Project within the H-IND district requires the approval of a Precise Plan of Design, and the applicant has agreed to apply for Precise Plan of Design No. 2020-0011 ("PPD No. 2020-0011"), in accordance with Chapter 18.65 (Precise Plan of Design) of the Rialto Municipal Code; and

WHEREAS, pursuant to the provisions of the California Environmental Quality Act, Public Resources Code Sections 21000 et. seq. (" CEQA"), the State's CEQA Guidelines, California Code of Regulations, Title 14, Section 15000 et. seq., and Government Code Section

65962.5(f) (Hazardous Waste and Substances Statement), the City reviewed an Initial Study (Environmental Assessment Review No. 2019-0053) prepared by NV5, Inc. and determined that there is no substantial evidence that the approval of the Project would result in a significant adverse effect on the environment, provided appropriate mitigation measures are imposed on the Project; thus, a Mitigated Negative Declaration was prepared and notice thereof was given in the manner required by law; and

WHEREAS, a Notice of Intent to adopt the Mitigated Negative Declaration for the Project was published in the San Bernardino Sun newspaper, and mailed to all property owners within 300 feet of the Project Site, and a twenty (20) day public comment period was held from October 25, 2021 to November 13, 2021; and

WHEREAS, The Planning Division did not receive any public comment letters during the twenty (20) day public comment period; and

WHEREAS, the City mailed public hearing notices for the proposed Project to all property owners within 300 feet of the project site, and published the public hearing notice in the San Bernardino Sun newspaper as required by State law; and

WHEREAS, on November 24, 2021, the Planning Commission of the City of Rialto conducted a duly noticed public hearing, as required by law, on the Mitigated Negative Declaration and PPD No. 2020-0011, took testimony, at which time it received input from staff, the city attorney, and the Applicant; heard public testimony; discussed the proposed Mitigated Negative Declaration and PPD No. 2020-0011; and closed the public hearing; and

WHEREAS, all legal prerequisites to the adoption of this Resolution have occurred.

NOW, THEREFORE, BE IT RESOLVED by the Planning Commission of the City of Rialto as follows:

<u>SECTION 1:</u> The Planning Commission hereby finds all of the above recitals to be true and correct.

<u>SECTION 2:</u> The Planning Commission has independently reviewed and considered the proposed Mitigated Negative Declaration, the public comments upon it, and other evidence and finds that the Mitigated Negative Declaration was prepared in the manner required by law, and

there is no substantial evidence, provided appropriate mitigation measures are imposed, that the Project would result in a significant adverse effect upon the environment.

SECTION 3: The Initial Study (Environmental Assessment Review No. 2020-0008) prepared for the project identified that the Site does contain suitable habitat for the endangered Delhi Sands Flower-Loving Fly (DSF), however, a Habitat Conservation Plan was established in 1999 whereby 30.5 acres of land to the west of the Site was set aside as "Conservation Area" to facilitate the development of the Site and other lands identified in the Habitat Conservation Plan. On August 27, 1999, the United States Fish and Wildlife Service issued a Federal Fish and Wildlife Permit to the applicant permitting future development of the Site, and said permit is valid until August 27, 2029, and therefore the proposed Project will have no individual or cumulative adverse impacts upon resources, as defined in Section 711. 2 of the State Fish and Game Code.

SECTION 4: The attached proposed Initial Study and Mitigated Negative Declaration, Exhibit "A" hereto, finds that there are no impacts or less than significant impacts to aesthetics, agriculture and forestry resources, air quality, energy, geology and solis, greenhouse gas emissions, hazards and hazardous materials, hydrology/water quality, land use/planning, mineral resources, noise, population/housing, public services, recreation, tribal cultural resources, utilities and service systems, and wildfire.

SECTION 5: With the imposition of mitigation measures that address potential impacts upon biological resources, cultural resources, traffic and transportation, and mandatory findings of significance in the community, and as set forth in the Mitigation Monitoring & Reporting Program, Exhibit "B" hereto, which is attached hereto and incorporated herein by this reference, the proposed Project's potential significant impacts will be reduced below a level of significance.

SECTION 6: For the foregoing reasons and based on the information and findings included in the Initial Study and Mitigated Negative Declaration, technical reports, Mitigation Monitoring and Reporting Program, Staff Report, public testimony, and all other documents and evidence in the administrative record of proceedings, the Planning Commission has determined that the Project, as conditioned and mitigated, will not have a significant adverse impact on the environment and also finds that the preparation of the Initial Study and Mitigated Negative

Declaration attached hereto complies with CEQA. Therefore, the Planning Commission hereby certifies the Initial Study, Mitigated Negative Declaration, and Mitigation Monitoring and Reporting Program, making certain environmental findings to allow the Project.

SECTION 7: The Chairman of the Planning Commission shall sign the passage and adoption of this resolution and thereupon the same shall take effect and be in force.

PASSED, APPROVED AND ADOPTED this 24th day of November, 2021.

____
FRANK GONZALEZ, CHAIR
CITY OF RIALTO PLANNING COMMISSION

STATE OF CALIFORNIA)
COUNTY OF SAN BERNARDINO) ss
CITY OF RIALTO)

I, Adrianna Martinez, Administrative Assistant of the City of Rialto, do hereby certify that the foregoing Resolution No. ____ was duly passed and adopted at a regular meeting of the Planning Commission of the City of Rialto held on the ___th day of ____, 2021.

Upon motion of Planning Commissioner_____., seconded by Planning Commissioner ____, the foregoing Resolution No. ____was duly passed and adopted.

Vote on the motion:

AYES:

NOES:

ABSENT:

IN WITNESS WHEREOF, I have hereunto set my hand and the Official Seal of the City of Rialto this __th day of ___, 2021.

____
ADRIANNA MARTINEZ, ADMINISTRATIVE ASSISTANT

Exhibit “A”

Exhibit "B"

RESOLUTION NO. <u>2021-XX</u>

A RESOLUTION OF THE PLANNING COMMISSION OF THE CITY OF RIALTO, CALIFORNIA APPROVING PRECISE PLAN OF DESIGN NO. 2020-0043 ALLOWING THE DEVELOPMENT OF A CONCRETE BLOCK MANUFACTURING FACILITY ON 32.48 GROSS ACRES OF LAND (APNS: 0260-061-41, -42, & -67) LOCATED AT THE TERMINUS OF FORTUNA WAY APPROXIMATELY 525 FEET EAST OF INDUSTRIAL DRIVE WITHIN THE HEAVY INDUSTRIAL (H-IND) LAND USE DISTRICT OF THE AGUA MANSA SPECIFIC PLAN.

WHEREAS, the applicant, Madrona Real Estate, LLC, proposes to develop a concrete block manufacturing facility ("Project") on 32.48 gross acres of land (APNs: 0260-061-41, -42, & -67) located at the terminus of Fortuna Way approximately 525 feet east of Industrial Drive within the Heavy Industrial (H-IND) land use district of the Agua Mansa Specific Plan ("Site"); and

WHEREAS, the Project will consist of the construction of a 135,581 square foot manufacturing plant building, a 10,018 square foot administration building, a 21,360 square foot mechanic shop/storage building, a 21,534 square foot metal canopy structure, sixty-nine (69) parking spaces, paving, landscaping, lighting, fencing, and drainage improvements on the Site; and

WHEREAS, pursuant to Table 8 (Permitted Uses) of the Agua Mansa Specific Plan, the operation of a concrete block manufacturing facility on the Site is a use permitted by right; and

WHEREAS, Pursuant to Section 18.65.010 of the Rialto Municipal Code, the Project requires a Precise Plan of Design, and the applicant has agreed to apply for Precise Plan of Design No. 2020-0011 ("PPD No. 2020-0011"); and

WHEREAS, on November 24, 2021, the Planning Commission of the City of Rialto conducted a duly noticed public hearing, as required by law, on PPD No. 2020-0011, took testimony, at which time it received input from staff, the city attorney, and the applicant; heard public testimony; discussed the proposed PPD No. 2020-0011; and closed the public hearing; and

WHEREAS, all legal prerequisites to the adoption of this Resolution have occurred.

NOW, THEREFORE, BE IT RESOLVED by the Planning Commission of the City of Rialto as follows:

SECTION 1. The Planning Commission hereby specifically finds that all of the facts set forth in the recitals above of this Resolution are true and correct and incorporated herein.

SECTION 2. Based on substantial evidence presented to the Planning Commission during the public hearing conducted with regard to PPD No. 2020-0011, including written staff reports, verbal testimony, site plans, other documents, and the conditions of approval stated herein, the Planning Commission hereby determines that PPD No. 2020-0011 satisfies the requirements of Section 18.65.020E of the Rialto Municipal Code pertaining to the findings which must be made precedent to granting a Precise Plan of Design. The findings are as follows:

1. The proposed development is in compliance with all city ordinances and regulations, unless in accordance with an approved variance; and

This finding is supported by the following facts:

The Site has a General Plan land use designation of General Industrial with a Specific Plan Overlay, and a zoning designation of Agua Mansa Specific Plan. Furthermore, the Site is located within the H-IND land use district of the Agua Mansa Specific Plan. The Project, as conditioned herein, will comply with all City ordinances and regulations including those of the H-IND land use district, the Agua Mansa Specific Plan, and the City's Design Guidelines. The H-IND land use district allows for the development and operation of concrete block manufacturing facilities, as proposed by the Project. Additionally, the Project meets all the required development standards of the H-IND zone including, but not limited to, required building setbacks, parking, landscaping, building height, floor area ratio, etc.

2. The site is physically suitable for the proposed development, and the proposed development will be arranged, designed, constructed, and maintained so that it will not be unreasonably detrimental or injurious to property, improvements, or the health, safety or general welfare of the general public in the vicinity, or otherwise be inharmonious with the city's general plan and its objectives, zoning ordinances or any applicable specific plan and its objectives; and

This finding is supported by the following facts:

The Site is relatively flat, asymmetrical-shaped, 32.48 gross acres in size, and adjacent to two (2) public streets – Fortuna Way and Singleton Drive. To the north of the project site is an 83.72-acre active construction debris landfill operated by Agua Mansa Properties, Inc., and to the east is the Agua Mansa Pioneer Cemetery and approximately 11.74 acres of vacant land. To the south of the project site is an 11.34-acre concrete paver manufacturing facility operated by Angelus Block Co, Inc., and to the west is an 11.07-acre cement product manufacturing facility operated by E-Z Mix, Inc. and approximately

30.5 acres of vacant land designated as a habitat conservation area. The Project is consistent with the H-IND land use district and the surrounding land uses. The area surrounding the project site predominantly consists of lands developed with industrial uses and vacant lands designated for industrial uses, and therefore the project is not expected to negatively impact any uses. The project will be a benefit to the community and an improvement to the surrounding area.

3. The proposed development will not unreasonably interfere with the use or enjoyment of neighboring property rights or endanger the peace, health, safety or welfare of the general public; and

This finding is supported by the following facts:

The Project's effects will be minimized through the implementation of the Conditions of Approval contained herein, such as extensive landscaping, concrete screen walls, decorative paving, and enhanced architectural features. To the north of the project site is an 83.72-acre active construction debris landfill operated by Agua Mansa Properties, Inc., and to the east is the Agua Mansa Pioneer Cemetery and approximately 11.74 acres of vacant land. To the south of the project site is an 11.34-acre concrete paver manufacturing facility operated by Angelus Block Co, Inc., and to the west is an 11.07-acre cement product manufacturing facility operated by E-Z Mix, Inc. and approximately 30.5 acres of vacant land designated as a habitat conservation area. The Project is consistent with the H-IND land use district and the surrounding land uses. The nearby area is predominantly zoned for and developed with industrial uses. The project is not expected to negatively impact any uses since measures, such as the installation of a solid screen wall and landscape buffering, will ensure that both noise and visual impacts remain at acceptable levels.

4. The proposed development will not substantially interfere with the orderly or planned development of the City of Rialto.

This finding is supported by the following facts:

The Project is consistent with the H-IND land use district of the Agua Mansa Specific Plan and is a logical addition to the existing industrial uses immediately to the south and west of the Site and throughout most of the Agua Mansa Specific Plan area. The design of the Project will ensure a continuation of the public improvements and aesthetics present in the surrounding area. The City staff have reviewed the design of the Project to ensure compliance with all health, safety, and design requirements to ensure the Project will enhance the infrastructure and aesthetics of the local community.

<u>SECTION 3.</u> Based on the findings and recommended mitigation within the Initial Study, staff determined that the project will not have an adverse impact on the environment, provided that mitigation measures are implemented, and a Mitigated Negative Declaration was prepared. The local

newspaper published a copy of the Notice of Intent to adopt the Mitigated Negative Declaration for the project, and the City mailed the notice to all property owners within 300 feet of the project site for a public comment period held from October 25, 2021 to November 13, 2021. The Mitigated Negative Declaration was prepared in accordance with the California Environmental Quality Act (CEQA). The Planning Commission directs the Planning Division to file the necessary documentation with the Clerk of the Board of Supervisors for San Bernardino County.

SECTION 4. The Planning Commission hereby approves PPD No. 2020-0011 to allow the development of a concrete block manufacturing facility consisting of a 135,581 square foot manufacturing plant building, a 10,018 square foot administration building, a 21,360 square foot mechanic shop/storage building, a 21,534 square foot metal canopy structure, sixty-nine (69) parking spaces, paving, landscaping, lighting, fencing, and drainage improvements on 32.48 gross acres of land (APNs: 0260-061-41, -42, & -67) located at the terminus of Fortuna Way approximately 525 feet east of Industrial Drive within the Heavy Industrial (H-IND) land use district of the Agua Mansa Specific Plan, in accordance with the plans and application on file with the Planning Division, subject to the following Conditions of Approval:

1. PPD No. 2020-0011 is approved allowing the development of a 135,581 square foot manufacturing plant building, a 10,018 square foot administration building, a 21,360 square foot mechanic shop/storage building, a 21,534 square foot metal canopy structure, sixty-nine (69) parking spaces, paving, landscaping, lighting, fencing, and drainage improvements on 32.48 gross acres of land (APNs: 0260-061-41, -42, & -67) located at the terminus of Fortuna Way approximately 525 feet east of Industrial Drive, subject to the Conditions of Approval contained herein.

2. The approval of PPD No. 2020-0011 is granted for a one (1) year period from the date of approval. Approval of PPD No. 2020-0011 will not become effective until the applicant has signed a Statement of Acceptance acknowledging awareness and acceptance of the required Conditions of Approval contained herein. Any request for an extension shall be reviewed by the Community Development Director and shall be based on the progress that has taken place toward the development of the project.

3. The development associated with PPD No. 2020-0011 shall conform to the site plan, floor plans, roof plans, exterior elevations, preliminary grading plan, preliminary utility plan, and preliminary landscape plan attached hereto as Exhibit A, except as may be required to be modified based on the Conditions of Approval contained herein.

4. The development associated with PPD No. 2020-0011 shall comply with all applicable sections of the Agua Mansa Specific Plan, the Rialto Municipal Code, and all other applicable State and local laws and ordinances.

5. City inspectors shall have access to the site to reasonably inspect the site during normal working hours to assure compliance with these conditions and other codes.

6. The applicant shall indemnify, protect, defend, and hold harmless, the City of Rialto, and/or any of its officials, officers, employees, agents, departments, agencies, and instrumentalities thereof (collectively, the "City Parties"), from any and all claims, demands, law suits, writs of mandamus, and other actions and proceedings (whether legal, equitable, declaratory, administrative or adjudicatory in nature), and alternative dispute resolutions procedures (including, but not limited to arbitrations, mediations, and other such procedures), (collectively "Actions"), brought against the City, and/or any of its officials, officers, employees, agents, departments, agencies, and instrumentalities thereof, that challenge, attack, or seek to modify, set aside, void, or annul, the any action of, or any permit or approval issued by, the City and/or any of its officials, officers, employees, agents, departments, agencies, and instrumentalities thereof (including actions approved by the voters of the City), for or concerning the Project (collectively, the "Entitlements"), whether such Actions are brought under the California Environmental Quality Act, the Planning and Zoning Law, the Subdivision Map Act, Code of Civil Procedure Chapter 1085 or 1094.5, the California Public Records Act, or any other state, federal, or local statute, law, ordinance, rule, regulation, or any decision of a court of competent jurisdiction. This condition to indemnify, protect, defend, and hold the City harmless shall include, but not limited to (i) damages, fees and/or costs awarded against the City, if any, and (ii) cost of suit, attorneys' fees and other costs, liabilities and expenses incurred in connection with such proceeding whether incurred by applicant, Property owner, or the City and/or other parties initiating or bringing such proceeding (collectively, subparts (i) and (ii) are the "Damages"). Notwithstanding anything to the contrary contained herein, the Applicant shall not be liable to the City Parties under this indemnity to the extent the Damages incurred by any of the City Parties in such Action(s) are a result of the City Parties' fraud, intentional misconduct or gross negligence in connection with issuing the Entitlements. The applicant shall execute an agreement to indemnify, protect, defend, and hold the City harmless as stated herein within five (5) days of approval of PPD No. 2020-0011.

7. In accordance with the provisions of Government Code Section 66020(d)(1), the imposition of fees, dedications, reservations, or exactions for this Project, if any, are subject to protest by the applicant at the time of approval or conditional approval of the Project or within 90 days after the date of the imposition of the fees, dedications, reservations, or exactions imposed on the Project.

8. The applicant shall complete and abide by all pre-construction mitigation measures contained within the Mitigation Monitoring and Reporting Program associated with Environmental Assessment Review No. 2020-0008, prior to the issuance of a grading permit.

9. The applicant shall complete and abide by all during-construction mitigation measures contained within the Mitigation Monitoring and Reporting Program associated with Environmental Assessment Review No. 2020-0008, prior to the conducting of a final inspection by the Building Division.

10. The operator(s) and/or tenant(s) on the Site and within the buildings shall always conduct operations consistent with the environmental analysis contained within Environmental Assessment Review No. 2020-0008.

11. The operator(s) and/or tenant(s) on the Site and within the buildings shall always abide by all operational mitigation measures contained within the Mitigation Monitoring and Reporting Program associated with Environmental Assessment Review No. 2020-0008.

12. The applicant shall secure the services of a tribal cultural monitor to be present during all ground disturbance activities associated with the construction of this project. The tribal cultural monitor shall be approved by the Gabrieleño Band of Mission Indians-Kizh Nation, and documentation of coordination between the applicant and the Gabrieleño Band of Mission Indians-Kizh Nation on this matter shall be provided to the Planning Division prior to the issuance of a grading permit.

13. In order to provide enhanced building design in accordance with Chapter 18.61 (Design Guidelines) of the Rialto Municipal Code, the applicant shall provide internal roof access only for the building. The internal roof access shall be identified within the formal building plan check submittal prior to the issuance of building permits.

14. The applicant shall construct at least one (1) ADA accessible trash enclosure on the project site. The trash enclosure shall provide room for one (1) commercial waste container and one (1) commercial recycling container. The exterior of each trash enclosure shall match the material and base color of the building. Additionally, the trash enclosure shall contain solid steel doors and a flat solid cover. Corrugated metal and chain-link are not acceptable materials to use as a part of the trash enclosure. The location of the trash enclosure shall be identified on the site plan within the formal building plan check prior to the issuance of building permits. An elevation detail for the trash enclosure shall be provided within formal building plan check submittal prior to the issuance of building permits.

15. The applicant shall submit a formal Landscape Plan to the Planning Division prior to the issuance of building permits. The submittal shall include three (3) sets of planting and irrigation plans, a completed Landscape Plan Review application, and the applicable review fee.

16. The applicant shall plant one (1) tree every thirty (30) feet on-center within the on-site landscape setback along Fortuna Way. All trees within the landscape setback shall be a minimum of twenty-four (24) inch box in size, upon initial planting. Thereafter, the trees within the landscape setback shall be permanently irrigated and maintained by the property owner. At least fifty (50) percent of the trees within the setback shall consist of evergreen broadleaf trees, while the remaining percentage may consist of broadleaf deciduous trees and/or palm trees. The trees shall be identified on the formal Landscape Plan submittal prior to the issuance of a landscape permit.

17. The applicant shall plant shrubs that surround all ground mounted equipment and utility boxes, including transformers, fire-department connections, backflow devices, etc. for the purpose of providing screening of said equipment and utility boxes. All equipment and utility box screen shrubs shall be a minimum of five (5) gallons in size upon initial planting, and the shrubs shall be spaced no more than three (3) feet on-center. Thereafter, the equipment and utility box screen shrubs shall be permanently irrigated and maintained into a continuous box-shape with a height of no less than three and one-half (3.5) feet above the finished grade. The shrubs shall be identified on the formal Landscape Plan submittal prior to the issuance of a landscape permit.

18. The applicant shall plant a substantial amount of trees, shrubs, and groundcover throughout all land on-site and off-site (adjacent to the project site) that is not covered by structures, paving, walkways, parking areas, and driveways. Trees shall be planted a minimum of thirty (30) feet on-center, and all shrubs and groundcover shall be planted an average of three (3) feet on-center or less. All trees shall be minimum of fifteen (15) gallons in size upon initial planting, unless otherwise specified herein. At least fifty (50) percent of the trees shall consist of evergreen broadleaf trees, while the remaining percentage may consist of broadleaf deciduous trees and/or palm trees. All shrubs shall be a minimum of one (1) gallon in size, unless otherwise specified herein. All planter areas shall receive a minimum two (2) inch thick layer of brown bark, organic mulch, and/or decorative rock upon initial planting. Pea gravel and decomposed granite are not acceptable materials to use within planter areas. All planter areas on-site shall be permanently irrigated and maintained. The planting and irrigation shall be identified on the formal Landscape Plan submittal prior to the issuance of a landscape permit.

19. All planting and irrigation shall be installed on-site in accordance with the approved landscape plans and permit prior to the issuance of a Certificate of Occupancy. The installation of the planting and irrigation shall be certified in writing by the landscape architect responsible for preparing the landscape plans prior to the issuance of a Certificate of Occupancy.

20. Any tubular steel fencing and/or sliding gates shall be painted black prior to the issuance of a Certificate of Occupancy, unless specified otherwise herein.

21. All non-glass doors shall be painted to match the color of the adjacent wall prior to the issuance of a Certificate of Occupancy.

22. All signage on the building shall comply with Chapter 18.102 (Regulation of Signs and Advertising Structures) of the Rialto Municipal Code.

23. The applicant shall comply with all conditions of approval for PPD No. 2020-0011 to the satisfaction of the City Engineer, prior to the issuance of a Certificate of Occupancy.

24. All improvements within the public right-of-way require a City of Rialto Encroachment Permit.

25. The applicant shall pay all applicable development impact fees in accordance with the current City of Rialto fee ordinance, including any Transportation and Traffic Fair Share Contribution fees, prior to the issuance of any building permit related to the Project.

26. The applicant shall contribute a fair-share payment in the amount of $724,398 (less the credit identified below) towards roadway improvements as identified in the Traffic Impact Study prepared for the project by NV5, Inc. and as approved by the Transportation Commission on October 6, 2021, prior to the issuance of any building permit related to the Project.

27. The applicant shall enter into a fee credit agreement to credit Regional Transportation DIF fees against the fair-share payment as identified in the Traffic Impact Study.

28. The applicant shall apply and complete the Special District Annexation for the public street lighting and the public landscape and irrigation, including applicable easement areas, parkway areas, and raised medians along the property frontage, as determined by the City Engineer, prior to the issuance of the Grading/On-site Construction Permit.

29. A City of Rialto Off-site Construction Permit is required for any improvements within the public right-of-way. In an effort to expedite and facilitate improvements in the public right-of-way, the applicant is responsible for submitting a multi-phase master plan traffic control plan which includes all phases of construction in the public right-of-way i.e. sewer, water, overhead, underground, etc. prior to the issuance of Off-Site Construction Permit/Encroachment Permit. Note, in an effort to simplify the permitting process, a single master Off-Site Construction Permit shall replace individual Encroachment Permits to be pulled by the applicant's contractor.

30. At the discretion of the City Engineer, the applicant shall apply for annexation of the underlying property into City of Rialto Landscape and Lighting Maintenance District No. 2 (“LLMD 2”) or enter into a landscape maintenance agreement to be recorded on the property. An application fee of $5,000 shall be paid at the time of application. Annexation into LLMD 2 is a condition of acceptance of any new median, parkway, and/or easement landscaping, or any new public street lighting improvements, to be maintained by the City of Rialto. All final approved plans and documents required for the annexation shall be submitted by the property owner prior to issuance of a building permit. The annexation process shall be completed prior to recordation of any applicable Final Tract/Parcel Maps. For developments with no Final Maps or if the

Final Map does not create any new parcels, the annexation process shall be completed prior to issuance of any certificate of occupancy. Due to the required City Council Public Hearing action, the annexation process takes months and as such the developer is advised to submit all plans and documents required for Special District annexation as early-on in the in the plan review and permitting process to avoid any delays with issuance of permit(s) and certificate(s) of occupancy or approval of final map(s).

31. At the discretion of the City Engineer, the applicant shall submit off-site landscaping and irrigation system improvement plans for review and approval at the time of first (1st) public improvement plan submittal to the Public Works Department. The parkway irrigation system shall be separately metered from the on-site private irrigation to be maintained for a period of one (1) year and annexed into a Special District. The off-site landscape and irrigation plans must show separate electrical and water meters to be annexed into the Landscape and Lighting Maintenance District No. 2 via a City Council Public Hearing. The landscape and irrigation plans shall be approved concurrently with the street improvement plans, prior to issuance of a building permit. The landscaping architect must contact the City of Rialto Landscape Contract Specialist at (909) 772-2635 to ensure all landscape and irrigation guidelines are met prior to plan approval. Electrical and water irrigation meter pedestals must not be designed to be installed at or near street intersections or within a raised median to avoid burdensome traffic control set-up during ongoing maintenance.

32. If the property is accepted in the LLMD, the applicant shall guarantee all new parkway landscaping irrigation for a period of one (1) year from the date of the City Engineer acceptance. Any landscaping that fails during the one-year landscape maintenance period shall be replaced with similar plant material to the satisfaction of the City Engineer, and shall be subject to a subsequent one year landscape maintenance period. The applicant must contact the City of Rialto Landscape Contract Specialist at (909) 772-2635 to confirm a full twelve (12) months' time of non-interrupted ongoing maintenance.

33. The applicant shall install City Engineer approved deep root barriers, in accordance with the Public Works Landscape and Irrigation Guidelines, for all trees installed within ten (10) feet of the public sidewalk and/or curb.

34. All new streetlights shall be installed on an independently metered, City-owned underground electrical system. The developer shall provide documentary proof of application with Southern California Edison ("SCE") for all appropriate service points and electrical meters prior to the issuance of a Certificate of Occupancy. New meter pedestals shall be installed, and electrical service paid by the developer, until such time as the underlying property is annexed into LLMD 2.

35. The applicant shall construct a new underground electrical system for public street lighting improvements along the project frontage of Santa Ana Avenue, as determined necessary by the City Engineer. New marbelite streetlight poles with LED light fixtures shall be installed in accordance with City of Rialto Standard Drawings.

36. The applicant is responsible for requesting from the Public Works Department any addresses needed for any building(s) and/or any electrical single/dual irrigation meter pedestal(s). The main building address shall be included on Precise Grading Plans and Building Plan set along with the PPD number. The electrical meter pedestal addresses (single or dual) shall be included in the public improvement plans.

37. The applicant shall submit street improvement plans by a registered California civil engineer to the Public Works Engineering Division for review. The plans shall be approved by the City Engineer prior to the issuance of building permits.

38. The applicant shall submit streetlight improvement plans by a registered California civil engineer to the Public Works Engineering Division for review. The plans shall be approved by the City Engineer prior to the issuance of building permits.

39. The applicant shall submit sewer improvement plans by a registered California civil engineer to the Public Works Engineering Division for review. The plans shall be approved by the City Engineer prior to the issuance of building permits.

40. The applicant shall submit traffic and signage improvement plans by a registered California civil engineer to the Public Works Engineering Division for review. The plans shall be approved by the City Engineer prior to the issuance of building permits.

41. The applicant shall submit copies of approved water improvement plans prepared by a registered California civil engineer to the Public Works Engineering Division for record purposes. The plans shall be approved by West Valley Water District, the water purveyor, prior to the issuance of building permits.

42. The applicant shall submit a Precise Grading/Paving Plan prepared by a California registered civil engineer to the Public Works Engineering Division for review and approval. The Grading Plan shall be approved by the City Engineer prior to the issuance of building permits.

43. The applicant shall submit a Geotechnical/Soils Report, prepared by a California registered Geotechnical Engineer, for and incorporated as an integral part of the grading plan for the proposed development. A copy of the Geotechnical/Soils Report shall be submitted to the Public Works Engineering Division with the first submittal of the Precise Grading Plan.

44. The applicant shall submit a wet-signed and stamped Earthwork Cut and Fill Certification Letter prepared by a Civil Engineer registered in the State of California to the Public Works Engineering Division for review.

45. The applicant shall provide pad elevation certification for all building pads, in conformance with the approved Precise Grading Plan, to the Engineering Division prior to construction of any building foundation.

46. The public street improvements outlined in these Conditions of Approval are intended to convey to the developer an accurate scope of required improvements, however, the City Engineer reserves the right to require reasonable additional improvements as may be determined in the course of the review and approval of street improvement plans required by these conditions.

47. The applicant shall construct asphalt concrete paving for streets in two separate lifts. The final lift of asphalt concrete pavement shall be postponed until such time that on-site construction activities are complete. Unless the City Engineer provide prior authorization, paving of streets in one lift prior to completion of on-site construction is not allowed. If City Engineer authorized, completion of asphalt concrete paving for streets prior to completion of on-site construction activities, requires additional paving requirements prior to acceptance of the street improvements, including, but not limited to: removal and replacement of damaged asphalt concrete pavement, overlay, slurry seal, or other repairs.

48. The applicant shall repair all street cuts for utilities in accordance with City Standard SC-231 within 72 hours of completion of the utility work; and any interim trench repairs shall consist of compacted backfill to the bottom of the pavement structural section followed by placement of standard base course material in accordance with the Standard Specifications for Public Work Construction ("Greenbook"). The base course material shall be placed the full height of the structural section to be flush with the existing pavement surface and provide a smooth pavement surface until permanent cap paving occurs using an acceptable surface course material.

49. In accordance with City Ordinance No. 1589, adopted to preserve newly paved streets, any and all street and/or trench cuts in newly paved streets will be subject to moratorium street repair standards as reference in Section 11.04.145 of the Rialto Municipal Code.

50. The applicant shall backfill and/or repair any and all utility trenches or other excavations within existing asphalt concrete pavement of off-site streets resulting from the proposed development, in accordance with City of Rialto Standard Drawings. The applicant shall be responsible for removing, grinding, paving and/or overlaying existing asphalt concrete pavement of off-site streets including pavement repairs in addition to pavement repairs made by utility companies for utilities installed for the benefit of the proposed development (i.e. West Valley Water District, Southern California Edison, Southern California Gas Company, Time Warner, Verizon, etc.). Multiple excavations, trenches, and other street cuts within existing asphalt concrete pavement of off-site streets resulting from the proposed Project may require complete grinding and asphalt concrete overlay of the affected off-site streets, at the discretion of the City Engineer. The pavement condition of the existing off-site streets shall be returned to a condition equal to or better than what existed prior to construction of the proposed Project.

51. The applicant shall install underground all existing electrical distribution lines of sixteen thousand volts or less and overhead service drop conductors, and all telephone,

television cable service, and similar service wires or lines, which are on-site, abutting, and/or transecting the site, in accordance with Chapter 15.32 of the Rialto Municipal Code. Utility undergrounding shall extend to the nearest off-site power pole. Unless City Engineer approved, no new power poles shall be installed. A letter from the owners of the affected utilities shall be submitted to the City Engineer prior to approval of the Precise Grading/Paving Plan, informing the City that they have been notified of the City's utility undergrounding requirement and their intent to commence design of utility undergrounding plans. When available, the utility undergrounding plan shall be submitted to the City Engineer identifying all above ground facilities in the area of the project to be undergrounded.

52. The applicant shall replace all damaged, destroyed, or modified pavement legends, traffic control devices, signing, striping, and streetlights, associated with the proposed Project shall be replaced as required by the City Engineer prior to issuance of a Certificate of Occupancy.

53. The applicant shall reconstruct any broken, chipped, or unsatisfactory sidewalks or curbs along the entire project frontage, in accordance with the General Plan and the City of Rialto Standard Drawings, as required by the City Engineer, prior to the issuance of a Certificate of Occupancy.

54. The applicant shall provide construction signage, lighting and barricading shall be provided during all phases of construction as required by City Standards or as directed by the City Engineer. As a minimum, all construction signing, lighting and barricading shall be in accordance with Part 6 "Temporary Traffic Control" of the 2014 California Manual on Uniform Traffic Control Devices, or subsequent editions in force at the time of construction.

55. Upon approval of any improvement plan by the City Engineer, the applicant shall provide the improvement plan to the City in digital format, consisting of a DWG (AutoCAD drawing file), DXF (AutoCAD ASCII drawing exchange file), and PDF (Adobe Acrobat) formats. Variation of the type and format of the digital data to be submitted to the City may be authorized, upon prior approval by the City Engineer.

56. At the discretion of the City Engineer, the applicant shall construct 4-inch conduit within the parkway area along the entire project frontages of Fortuna Way and Singleton Drive for future use.

57. The applicant shall dedicate additional right-of-way along the entire frontages of Fortuna Way and Singleton Drive, as necessary, to provide the ultimate half-width right-of-way, as required by the City Engineer.

58. The applicant shall construct two (2) new twenty-six (26) foot wide commercial driveway approaches connected to Fortuna Way, in accordance with City of Rialto Standard Drawings, or as otherwise approved by the City Engineer. Nothing shall be constructed or planted in the corner cut-off area which does exceed or will exceed 30

inches in height in order to maintain an appropriate corner sight distance, as required by the City Engineer.

59. The applicant shall construct curb ramps meeting current California State Accessibility standards on both sides of each driveway connected to Fortuna Way and Singleton Drive, in accordance with the City of Rialto Standard Drawings. The developer shall ensure that an appropriate path of travel, meeting ADA guidelines, is provided across the driveways, and shall adjust the location of the access ramps, if necessary, to meet ADA guidelines, subject to the approval of the City Engineer. If necessary, additional pedestrian and sidewalk easements shall be provided on-site to construct a path of travel meeting ADA guidelines.

60. At the discretion of the City Engineer, the applicant shall construct a 5-foot-wide sidewalk located adjacent to the curb along the entire project frontages of Fortuna Way and Singleton Drive, in accordance with City of Rialto Standard Drawings.

61. At the discretion of the City Engineer, the applicant shall remove existing pavement and construct new pavement with a minimum pavement section of 4 inches asphalt concrete pavement over 6 inches crushed aggregate base with a minimum subgrade of 24 inches at 95% relative compaction, or equal, along the entire frontages of Fortuna Way and Singleton Drive in accordance with City of Rialto Standard Drawings. The pavement section shall be determined using a Traffic Index ("TI") of 6. The pavement section shall be designed by a California registered Geotechnical Engineer using "R" values from the project site and submitted to the City Engineer for approval. Pavement shall extend from clean sawcut edge of pavement at centerline of each street.

62. The minimum pavement section for all on-site pavements shall be two (2) inches asphalt concrete pavement over 4 inches crushed aggregate base with a minimum subgrade of 24 inches at 95% relative compaction, or equal. If an alternative pavement section is proposed, the proposed pavement section shall be designed by a California registered Geotechnical Engineer using "R" values from the project site and submitted to the City Engineer for approval.

63. The applicant shall connect the project to the City of Rialto sewer system and apply for a sewer connection account with Rialto Water Services.

64. Domestic water service to the underlying property is provided by West Valley Water District. The applicant shall be responsible for coordinating with West Valley Water District and complying with all requirements for establishing domestic water service to the property. The design must include fire hydrants along Fortuna Way and Singleton Drive.

65. The applicant shall install a new domestic water line lateral connection to the main water line within Fortuna Way, pursuant to the West Valley Water District requirements. A water line plan shall be approved by West Valley Water District prior to the issuance of building permits.

66. The applicant shall provide certification from Rialto Water Services and West Valley Water District that demonstrates that all water and/or wastewater service accounts for the project are documented, prior to the issuance of a Certificate of Occupancy or final inspection approval from the Public Works Engineering Division.

67. The applicant shall submit a Water Quality Management Plan identifying site specific Best Management Practices ("BMPs") in accordance with the Model Water Quality Management Plan ("WQMP") approved for use for the Santa Ana River Watershed. The site specific WQMP shall be submitted to the City Engineer for review and approval with the Precise Grading Plan. A WQMP Maintenance Agreement shall be required, obligating the property owner(s) to appropriate operation and maintenance obligations of on-site BMPs constructed pursuant to the approved WQMP. The WQMP and Maintenance Agreement shall be approved prior to issuance of a building permit, unless otherwise allowed by the City Engineer. The development of the Site is subject to the requirements of the National Pollution Discharge Elimination System (NPDES) Permit for the City of Rialto, issued by the Santa Ana Regional Water Quality Control Board, Board Order No. R8-2010-0036. Pursuant to the NPDES Permit, the Applicant shall ensure development of the site incorporates post-construction Best Management Practices ("BMPs") in accordance with the Model Water Quality Management Plan ("WQMP") approved for use for the Santa Ana River Watershed. The Applicant is advised that applicable Site Design BMPs will be required to be incorporated into the final site design, pursuant to a site specific WQMP submitted to the City Engineer for review and approval.

68. The applicant shall prepare a Notice of Intent (NOI) to comply with the California General Construction Stormwater Permit (Water Quality Order 2009-0009-DWQ as modified September 2, 2009) is required via the California Regional Water Quality Control Board online SMARTS system. A copy of the executed letter issuing a Waste Discharge Identification (WDID) number shall be provided to the City Engineer prior to issuance of a grading or building permit. The applicant's contractor shall prepare and maintain a Storm Water Pollution Prevention Plan ("SWPPP") as required by the General Construction Permit. All appropriate measures to prevent erosion and water pollution during construction shall be implemented as required by the SWPPP.

69. Prior to issuance of a certificate of occupancy or final City approvals, the applicant shall demonstrate that all structural BMP's have been constructed and installed in conformance with approved plans and specifications, and as identified in the approved WQMP.

70. All stormwater runoff passing through the site shall be accepted and conveyed across the property in a manner acceptable to the City Engineer. For all stormwater runoff falling on the site, on-site retention or other facilities approved by the City Engineer shall be required to contain the increased stormwater runoff generated by the development of the property. Provide a hydrology study, prepared by a Civil Engineer, to determine the volume of increased stormwater runoff due to development of the site,

and to determine required stormwater runoff mitigation measures for the proposed development. Hydrology studies shall be prepared in accordance with the San Bernardino County Hydrology Manual and Rialto drainage criteria. Final retention basin sizing and other stormwater runoff mitigation measures shall be determined upon review and approval of the hydrology study by the City Engineer and may require redesign or changes to site configuration or layout consistent with the findings of the final hydrology study. The volume of increased stormwater runoff to retain on-site shall be determined by comparing the existing "pre-developed" condition and proposed "developed" condition, using the 100-year frequency storm. All on-site and off-site designs must comply with Federal (NPDES), State, Regional, and City stormwater regulations.

71. Direct release of on-site nuisance water or stormwater runoff shall not be permitted to the adjacent public streets. Provisions for the interception of nuisance water from entering adjacent public streets from the project site shall be provided through the use of a minor storm drain system that collects and conveys nuisance water to landscape or parkway areas, and in only a stormwater runoff condition, pass runoff directly to the streets through parkway or under sidewalk drains. All on-site and off-site designs must comply with NPDES stormwater regulations.

72. The original improvement plans prepared for the proposed development and approved by the City Engineer (if required) shall be documented with record drawing "as-built" information and returned to the Engineering Division prior to issuance of a final certificate of occupancy. Any modifications or changes to approved improvement plans shall be submitted to the City Engineer for approval prior to construction.

73. The applicant shall adhere to the City Council approved franchise agreements and disposal requirements during all construction activities, in accordance with Section 8.08 (Refuse Collection of the City of Rialto Municipal Code).

74. Prior to commencing with any grading, the applicant shall implement the required erosion and dust control measures shall be in place. In addition, the following shall be included if not already identified:

    a. 6 foot high tan colored perimeter screened fencing

    b. Contractor information signage including contact information along the street frontages of Fortuna Way and Singleton Drive.

    c. Post dust control signage with the following verbiage: "Project Name, WDID No., IF YOU SEE DUST COMING FROM THIS PROJECT CALL: NAME (XXX) XXX-XXX, If you do not receive a response, please call the AQMD at 1-800-CUT-SMOG/1-800-228-7664"

75. The applicant shall remove any graffiti within 24 hours, before, during, and post construction.

76. The applicant shall submit full architectural and structural plans with all mechanical, electrical, and plumbing plans, structural calculations, truss calculations and layout, rough grading plans approved by Public Works Engineering, Water Quality Management Plan, Erosion Control Plan, Stormwater Pollution Prevention Plan, and Title 24 Energy Calculations to the Building Division for plan check and review, prior to the issuance of building permits.

77. The applicant shall provide a Scope of Work on the title page of the architectural plan set. The Scope of Work shall call out all work to be permitted (ex. Main structure, perimeter walls, trash enclosure, etc.).

78. The applicant shall design the structures in accordance with the 2019 California Building Code, 2019 California Mechanical Code, 2019 California Plumbing Code, and the 2019 California Electrical Code, 2019 Residential Code and the 2019 California Green Buildings Standards adopted by the State of California.

79. The applicant shall design the structures to withstand ultimate wind speed of 130 miles per hour, exposure C and seismic zone D.

80. The applicant shall submit fire sprinkler, fire alarm systems, and fire hydrant plans to the Building Division for plan review concurrently with building plans and shall be approved prior to the issuance of a building permit.

81. The applicant shall obtain an Electrical Permit from the Building Division for any temporary electrical power required during construction. No temporary electrical power will be granted to a project unless one of the following items is in place and approved by the Building Division: (A) Installation of a construction trailer, or, (B) Security fencing around the area where the electrical power will be located.

82. The applicant shall install temporary construction fencing and screening around the perimeter of the project site. The fencing and screening shall be maintained at all times during construction to protect pedestrians.

83. The applicant shall install any required temporary construction trailer on private property. No trailers are allowed to be located within the public right-of-way. The trailer shall be removed prior to the issuance of a Certificate of Occupancy.

84. The applicant shall design and construct accessible paths of travel from the building's accessible entrances to the public right-of-way, accessible parking, and the trash enclosure(s). Paths of travel shall incorporate (but not limited to) exterior stairs, landings, walks and sidewalks, pedestrian ramps, curb ramps, warning curbs, detectable warning, signage, gates, lifts and walking surface materials, as necessary. The accessible route(s) of travel shall be the most practical direct route between accessible building entrances, site facilities, accessible parking, public sidewalks, and the

accessible entrance(s) to the site, California Building Code, (CBC) Chapter 11, Sec, 11A and 11B.

85. Prior to issuance of a Building Permit all of the following must be in place on the Site: a portable toilet with hand wash station, temporary construction fencing, and signage on each adjacent street saying "If there is any dust or debris coming from this site please contact (superintendent number here) or the AQMD if the problem is not being resolved" or something similar to this.

86. The applicant shall provide temporary toilet facilities for the construction workers. The toilet facilities shall always be maintained in a sanitary condition. The construction toilet facilities of the non-sewer type shall conform to ANSI ZA.3.

87. The applicant shall underground all on site utilities to the new proposed structures, prior to the issuance of a Certificate of Occupancy, unless prior approval has been obtained by the utility company or the City.

88. Prior to issuance of Building Permits, site grading final and pad certifications shall be submitted to the Building Division, which include elevation, orientation, and compaction. The certifications are required to be signed by the engineer of record.

89. The applicant shall provide proof of payment to the Colton Joint Unified School District for all required school fees, prior to the issuance of a building permit.

90. Site facilities such as parking open or covered, recreation facilities, and trash dumpster areas, and common use areas shall be accessible per the California Building Code, Chapter 11.

91. The applicant shall place a copy of the Conditions of Approval herein on within the building plan check submittal set and include the PPD number on the right bottom corner cover page in 20 point bold, prior to the issuance of a building permit.

92. The applicant shall ensure that a minimum of 65% of all construction and demo debris shall be recycled using an approved City of Rialto recycling facility during construction. Copies of receipts for recycling shall be provided to the City Inspector and a copy shall be placed in the office of the construction site.

93. Prior to issuance of Building Permits, on site water service shall be installed and approved by the responsible agency. On site fire hydrants shall be approved by the Fire Department. No flammable materials will be allowed on the site until the fire hydrants are established and approved.

94. The applicant shall comply with all applicable requirements of the California Fire Code and Chapter 15.28 (Fire Code) of the Rialto Municipal Code.

95. At the discretion of the Rialto Police Department, the applicant shall illuminate all walkways, passageways, and locations where pedestrians are likely to travel with a minimum of 1.5-foot candles (at surface level) of light during the hours of darkness. Lighting shall be designed/constructed in such a manner as to automatically turn on at dusk and turn off at dawn.

96. At the discretion of the Rialto Police Department, the applicant shall illuminate all alleyways, driveways, and uncovered parking areas with a minimum of 1.5-foot candles (at surface level) of light during the hours of darkness. Lighting shall be designed/constructed in such a manner as to automatically turn on at dusk and turn off at dawn.

97. At the discretion of the Rialto Police Department, the applicant shall illuminate all loading dock areas, truck well areas, and delivery areas with a minimum of 1.5 foot-candles (at surface level) of light during the hours of darkness. Lighting shall be designed/constructed in such a manner as to automatically turn on at dusk and turn off at dawn.

98. The applicant shall design/construct all lighting fixtures and luminaries, including supports, poles and brackets, in such a manner as to resist vandalism and/or destruction by hand.

99. The applicant shall provide an illuminated channel letter address prominently placed on the building to be visible to the front of the location, prior to the issuance of a Certificate of Occupancy.

100. At the discretion of the Rialto Police Department, the applicant shall install exterior security cameras at the location that cover the entire Site, prior to the issuance of a Certificate of Occupancy. The security cameras shall be accessible to the Rialto Police Department via FusionONE web application.

101. The applicant shall install Knox boxes immediately adjacent to all vehicle gates as well as the main entrance of each building and at least one (1) rear entrance on each building to facilitate the entry of safety personnel. The Knox boxes shall be installed in such a manner as to be alarmed, resist vandalism, removal, or destruction by hand, and be fully recessed into the building. The Knox boxes shall be equipped with the appropriate keys, for each required location, prior to the first day of business. The Knox-Box placement shall be shown on the formal building plan review submittal prior to the issuance of a building permit.

102. The applicant shall prominently display the address on the rooftop of the manufacturing plant building to be visible to aerial law enforcement or fire aircraft. Specifications to be followed for alphanumeric characters are as follows: Three (3) foot tall and six (6) inches thick alphanumeric characters. The alphanumeric characters shall be constructed in such a way that they are in stark contrast to the background to which they are attached

(e.g. white numbers and letters on a black background), and resistant weathering that would cause a degradation of the contrast.

103. The applicant shall provide an audible alarm within each building, prior to the issuance of a Certificate of Occupancy. The buildings shall be alarmed in such a way as to emit a continuous audible notification until reset by responsible personnel (e.g. alarmed exit device / crash bar.

104. The applicant or General Contractor shall identify each contractor and subcontractor hired to work at the job site on a Contractor Sublist form and return it to the Business License Division with a Business License application and the Business License tax fee based on the Contractors tax rate for each contractor.

105. Prior to issuance of a Certificate of Occupancy, the applicant shall pay a business license tax based on the Manufacturer tax rate.

SECTION 5. The Chairman of the Planning Commission shall sign the passage and adoption of this resolution and thereupon the same shall take effect and be in force.

PASSED, APPROVED AND ADOPTED this 24th day of November, 2021.

____
FRANK GONZALEZ, CHAIR
CITY OF RIALTO PLANNING COMMISSION

STATE OF CALIFORNIA)
COUNTY OF SAN BERNARDINO) ss
CITY OF RIALTO)

I, Adrianna Martinez, Administrative Assistant of the City of Rialto, do hereby certify that the foregoing Resolution No. ____ was duly passed and adopted at a regular meeting of the Planning Commission of the City of Rialto held on the ___th day of ____, 2021.

Upon motion of Planning Commissioner_____., seconded by Planning Commissioner ____, the foregoing Resolution No. ____was duly passed and adopted.

Vote on the motion:

AYES:

NOES:

ABSENT:

IN WITNESS WHEREOF, I have hereunto set my hand and the Official Seal of the City of Rialto this __th day of ___, 2021.

____

ADRIANNA MARTINEZ, ADMINISTRATIVE ASSISTANT

Exhibit A