

# TRAFFIC IMPACT STUDY

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Contractor's Yard for Pavement Rehab Company  
Sycamore Ave, Rialto

APN# 0254-142-15

Date: March 25, 2021

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Traffic Impact Study for Contractor's Yard for Pavement Rehab Company  
Sycamore Ave, Rialto

APN# 0254-142-15



Prepared under the supervision of

A handwritten signature in black ink, appearing to read "Jende Kay Hsu".

Jende Kay Hsu, P.E., T. E.  
California License # T2285

## **EXECUTIVE SUMMARY**

The proposed development plans to construct a contractor's yard for equipment storage and a two-story administrative building of 1,200 square feet for a pavement rehab company. The site is located on Sycamore Avenue (APN# 0254-142-15) between Slover Avenue and Cameron Way. This study is prepared in accordance with the approved scoping agreement by the City of Rialto and "Traffic Impact Analysis - Report Guidelines and Requirement".

With the passenger car equivalents (PCE) conversion of truck trips, the project is expected to generate an equivalent of 40 trips in the AM peak hour, including 7 inbound and 33 outbound trips, 40 trips in the PM peak hour, including 33 inbound and 7 outbound trips, and 80 daily trips. The study has analyzed three intersections along Riverside Avenue, including two I-10 freeway ramps that are within 2 miles from the project site and designated to take more than 40% of total traffic from the project.

According to the General Plan 2010, the acceptable level of service is LOS E for Riverside Avenue south of Metrolink tracks in the City of Rialto. With consideration of the threshold for significant impacts, the project will have no or less than significant impact. Nonetheless, the project is required to have a fair-share contribution to the planned widening improvement of Riverside Avenue to a 6-lane roadway with raised medians and additional turn lanes. The project's fair-share contribution calculated based on the DIF rate is \$30,040.

Site access is apparently adequate and safe. On-site circulation appears efficient and safe without bottleneck. Nonetheless, site plan is subject to review and approval by the Fire Department, Planning Department and Traffic Engineer.

## INTRODUCTION

The proposed development plans to construct a contractor's yard for equipment storage and a two-story administrative building of 1,200 square feet for a pavement rehab company. The site is located on Sycamore Avenue (APN# 0254-142-15) between Slover Avenue and Cameron Way in the City of Rialto. The proposed site plan is shown in **Exhibit 1**.

## STUDY SCENARIOS

In compliance with the "*City of Rialto Traffic Impact Analysis - Report Guidelines And Requirements*", this study includes the following scenarios:

- i. Existing Conditions
- ii. Project Completion (Existing + Ambient Background Growth + Project)
- iii. Cumulative Conditions (Existing + Growth + Project + Cumulative)
- iv. Proposed Mitigation Measures

The study has analyzed the following freeway interchanges ramps at Riverside Avenue that are within 2 miles and designated to take more than 40% of total traffic from the project:

1. Riverside Avenue at I-10 Westbound Ramps
2. Riverside Avenue at I-10 Eastbound Ramps
3. Riverside Avenue at Slover Avenue

## LEVEL OF SERVICE STANDARDS

According to the City of Rialto "*Traffic Impact Analysis Report Guidelines and Requirements, December 2013, Appendix F: Level of Service Standards*", the City of Rialto 2010 General Plan Update identifies that signalized intersections should operate at LOS D or better during the morning and evening peak hours except **Riverside Avenue** south of the Metrolink tracks all the way to the City's southern border, which can operate at **LOS E**. New development is required to mitigate traffic impacts exceeding these levels.



## EXISTING CONDITIONS

The project site situates on the west side of Sycamore Avenue between Slover Avenue and Cameron Way. The project site is zoned Heavy Industrial and currently vacant and unimproved. The vicinity map is shown on **Exhibit 2**.

Riverside Avenue is a north-south arterial with three northbound lanes and two southbound lanes at the I-10 overcrossing. The posted speed limit is 40 mph. Both freeway interchanges are controlled by traffic signals.

Based on scoping agreement approved by the City of Rialto, as shown in **Appendix A**, turning movement counts were performed on Thursday, November 5, 2020 for the following study intersections:

1. Riverside Avenue at I-10 Westbound Ramps
2. Riverside Avenue at I-10 Eastbound Ramps
3. Riverside Avenue at Slover Avenue

However, it is determined that traffic data collected on November 5, 2020 may have been affected by the COVID-19 pandemic resulting in a lower than normal traffic volumes. Therefore, the City suggested using traffic count data collected for a recently approved development of SC Fuels Rialto conducted by City Traffic Counters on September 26, 2019 to represent the existing conditions. Existing traffic volumes and lane configuration are illustrated in **Exhibit 3**. Complete traffic data can be found in **Appendix B**.

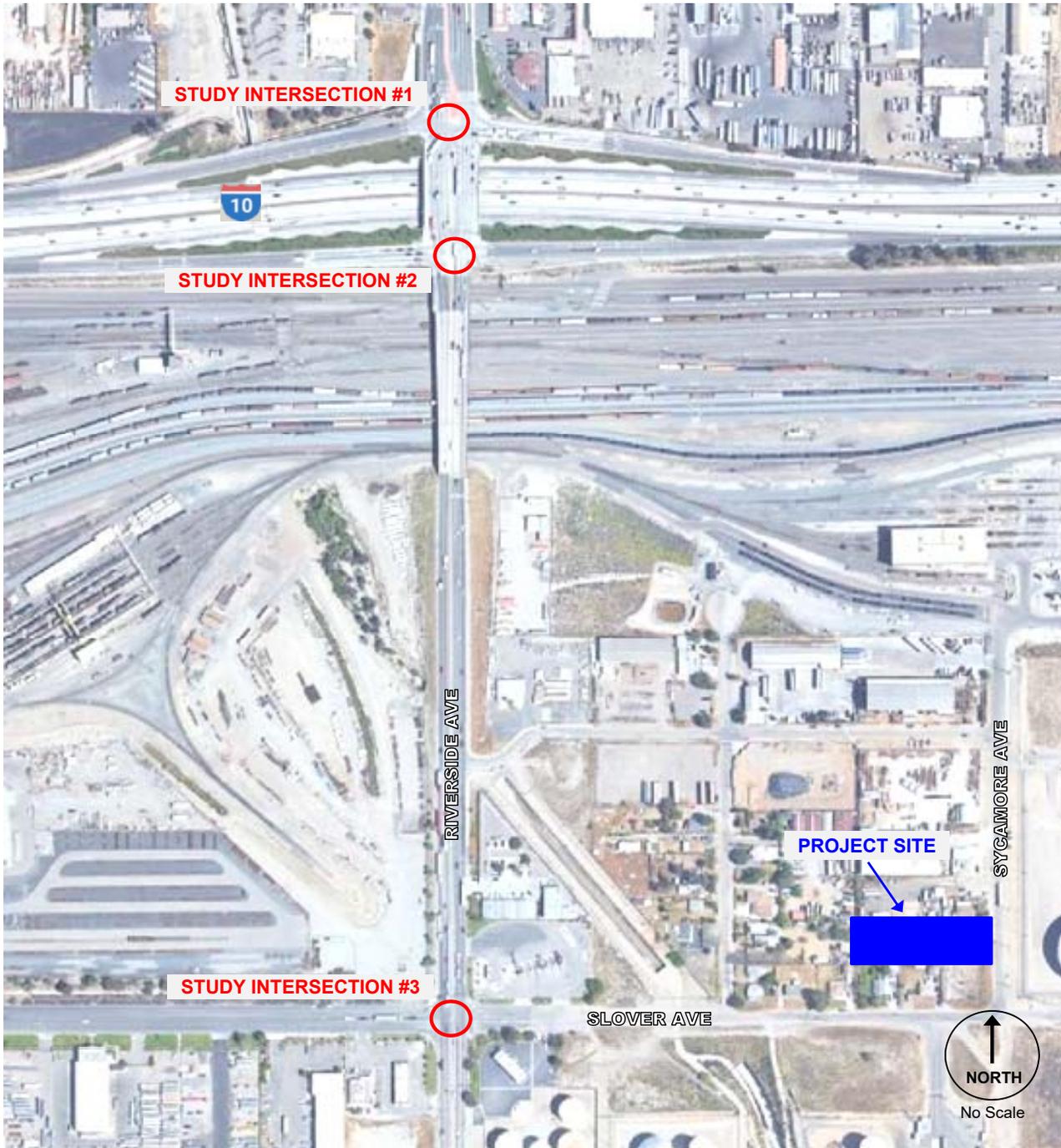
The level-of-service analysis is performed using SYNCHRO software consistent with the methodology of Highway Capacity Manual (HCM). **Table 1** shows existing traffic conditions of studied intersections. The analysis worksheets can be found in **Appendix C**.

**Table 1. Existing Traffic Conditions**

<b>Intersection</b>	<b>AM Peak LOS</b>	<b>AM Peak Delay</b>	<b>PM Peak LOS</b>	<b>PM Peak Delay</b>
1. Riverside Ave at I-10 WB Ramps	D	44.7 Sec	C	32.1 Sec
2. Riverside Ave at I-10 EB Ramps	C	28.2 Sec	F*	29.2 Sec
3. Riverside Ave at Slover Ave	C	39.3 Sec	E	58.7 Sec

\* Level of Service F is reported based on field observations of excessive northbound queues extending from I-10 Eastbound Ramps to Slover Avenue.

According to the General Plan 2010, the acceptable level of service is LOS E for Riverside Avenue south of Metrolink tracks in the City of Rialto.



**EXHIBIT 2. VICINITY MAP**  
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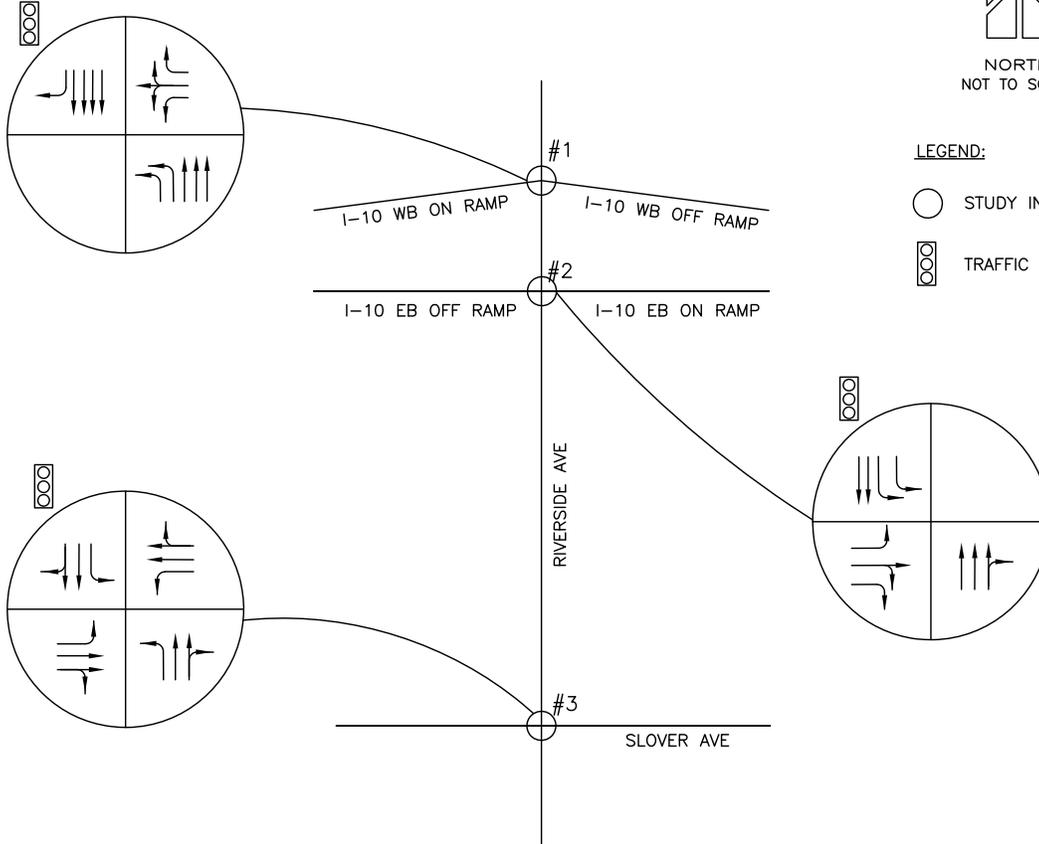


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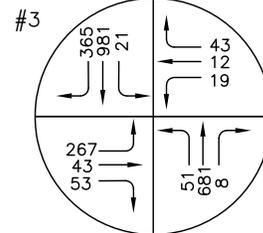
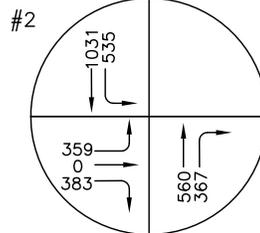
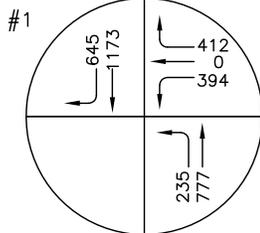
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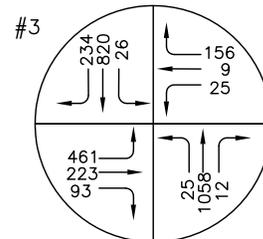
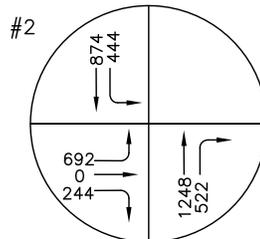
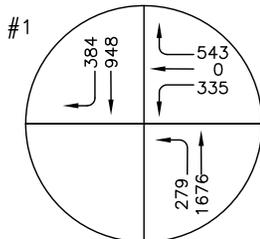
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PEAK  
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### EXISTING LANE CONFIGURATION AND TRAFFIC VOLUMES

### EXHIBIT 3

## TRIP GENERATION

Project's trip generation is often estimated using the rates and methodologies outlined in *Trip Generation, 10<sup>th</sup> Edition*, published by the Institute of Transportation Engineers (ITE). However, the subject land use is not listed in this reference material. Therefore, project's trip generation is estimated by the proposed activities upon project completion as approved in the scoping agreement, as shown in **Appendix A**.

The contractor's yard will be used to park off-road construction equipment including pavers, rollers, skip loaders, and skid steers as well as construction vehicles such as dump trucks, tractors, trailers, and pickup trucks. In the morning the contractor will haul off-road construction equipments with trailers to a remote job site and return to the yard when the job is done. Vehicle inventory is shown in **Table 2**.

**Table 2. Vehicle Inventory**

Vehicle Type	Classification	Quantity	Note
Freightliner Cascadia Day Cab Tractor & 48-ft Trailer	4-Axel Plus	1	3-Axle tractors pull 46-ft trailers (2-Axle) and haul "off-road" construction equipment to job sites.
Ford F550 & 26-ft Trailer	4-Axel Plus	6	2-Axle pickups pull 26-ft trailers (2-Axle) and haul "off-road" construction equipment to job sites.
Freightliner Super Ten	3-Axel	1	3-Axle Dump Trucks
Ford F150	Pickup	10	Crew trucks and Foreman trucks
Employee's Vehicle	Passenger Car	7	

According to the *City of Rialto Traffic Impact Study Guidelines and Requirements*, truck trips are converted into passenger car equivalents (PCE) based on the classification and number of axles, as shown in **Table 3**. With the PCE conversion of truck trips, the project is expected to generate an equivalent of 40 trips in the AM peak hour, including 7 inbound and 33 outbound trips, 40 trips in the PM peak hour, including 33 inbound and 7 outbound trips, and 80 daily trips.

**Table 3. Trip Generation with PCE Conversion**

Classification	Quantity	PCE	AM Peak		PM Peak		Daily
			IN	OUT	IN	OUT	
Truck: 4-axel plus	7	3	-	21	21	-	42
Truck: 3-axel	1	2	-	2	2	-	4
Passenger Car: Pickup	10	1	-	10	10	-	20
Passenger Car: Employee	7	1	7	-	-	7	14
Trip Generation with PCE Conversion			<b>7</b>	<b>33</b>	<b>33</b>	<b>7</b>	<b>80</b>

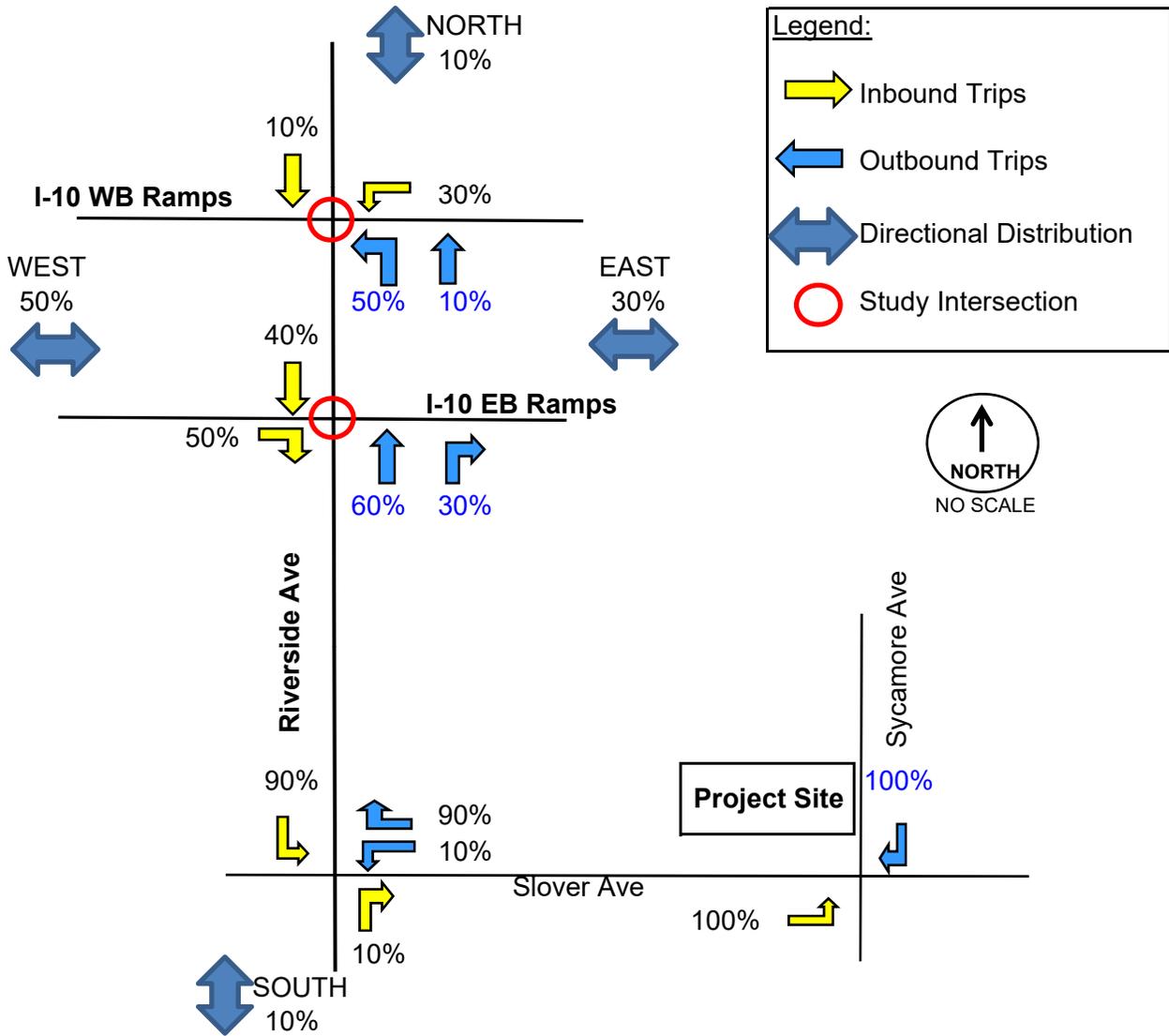
## **TRIP DISTRIBUTION**

Trip distribution represents the directional orientation of traffic to and from the proposed project. Directional orientation is largely influenced by the geographical location of the site, among many other factors. The trip distribution pattern for the project is illustrated on **Exhibit 4**.

## **TRAFFIC ASSIGNMENT**

The traffic assignment to and from the Site has been based upon the results of trip generation, trip distribution, and access layouts. **Exhibit 5** illustrates the traffic assignment of the proposed project for the AM and PM peak hours.

**EXHIBIT 4. TRIP DISTRIBUTION**

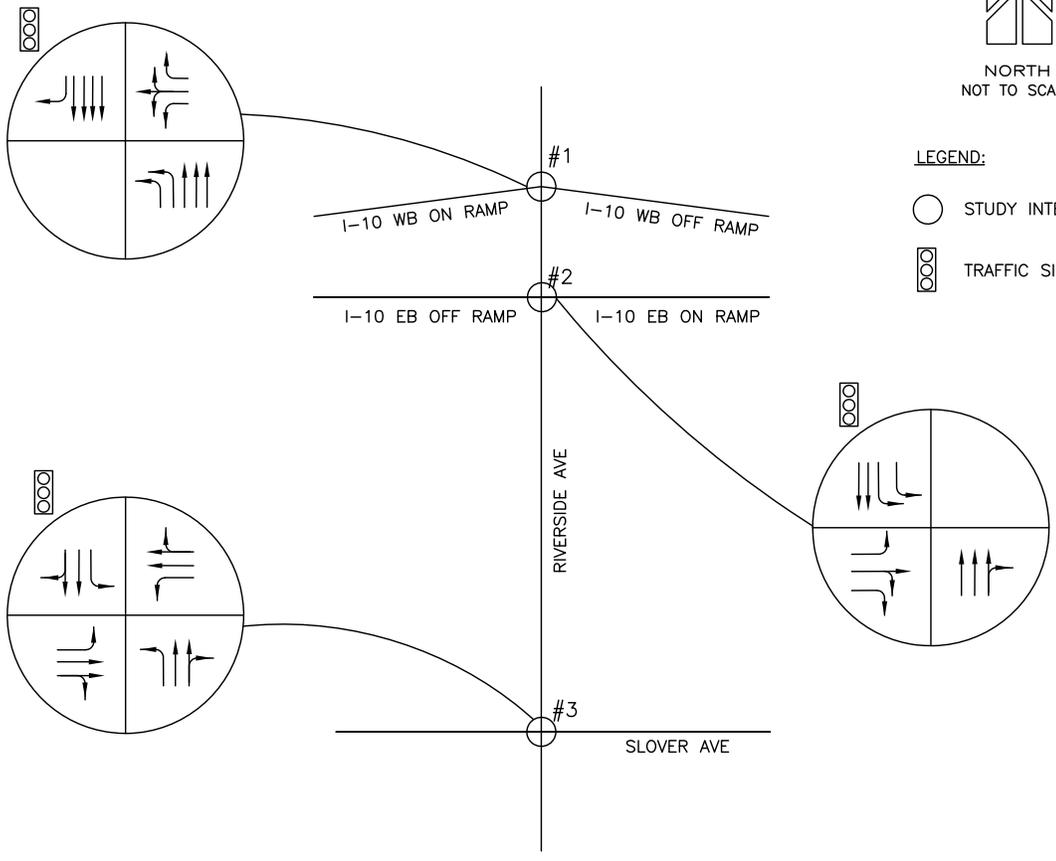




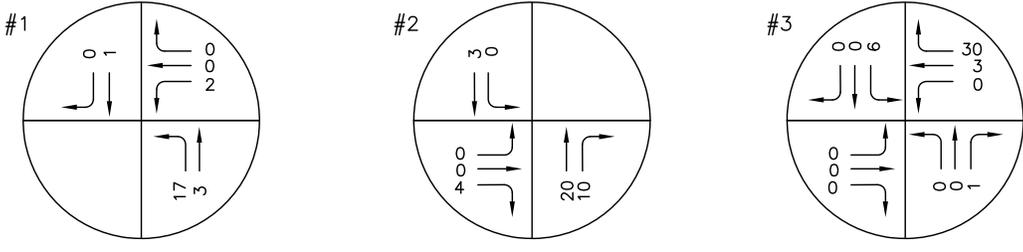
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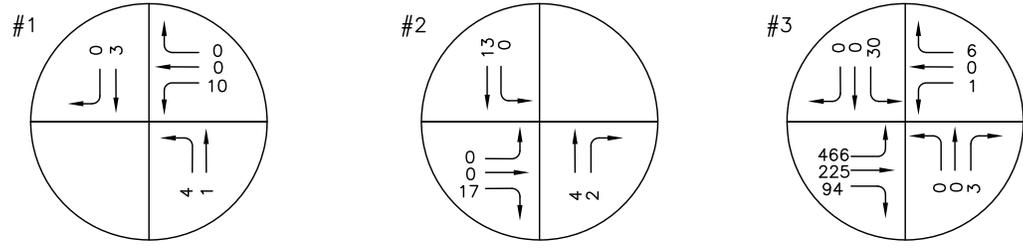
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**TRAFFIC ASSIGNMENT**  
**EXHIBIT 5**

## PRE-PROJECT COMPLETION (EXISTING + AMBIENT BACKGROUND GROWTH)

Year 2021 baseline traffic conditions prior to project completion is estimated by applying an annual growth rate of one percent (1%) over existing traffic counts that covers traffic increases due to regional developments. Pre-project completion traffic volumes are shown in **Exhibit 6**.

The level of services and intersection delays are shown in **Table 4**. Traffic data and analysis worksheets are shown in **Appendix C**.

**Table 4. Pre-Project Completion Traffic Conditions**

<b>Intersection</b>	<b>AM Peak LOS</b>	<b>AM Peak Delay</b>	<b>PM Peak LOS</b>	<b>PM Peak Delay</b>
1. Riverside Ave at I-10 WB Ramps	D	47.6 Sec	D	35.0 Sec
2. Riverside Ave at I-10 EB Ramps	C	29.2 Sec	F*	31.0 Sec
3. Riverside Ave at Slover Ave	D	42.5 Sec	E	63.4 Sec

\* Level of Service F is reported based on field observations of excessive northbound queues extending from I-10 Eastbound Ramps to Slover Avenue.

According to the General Plan 2010, the acceptable level of service is LOS E for Riverside Avenue south of Metrolink tracks in the City of Rialto.

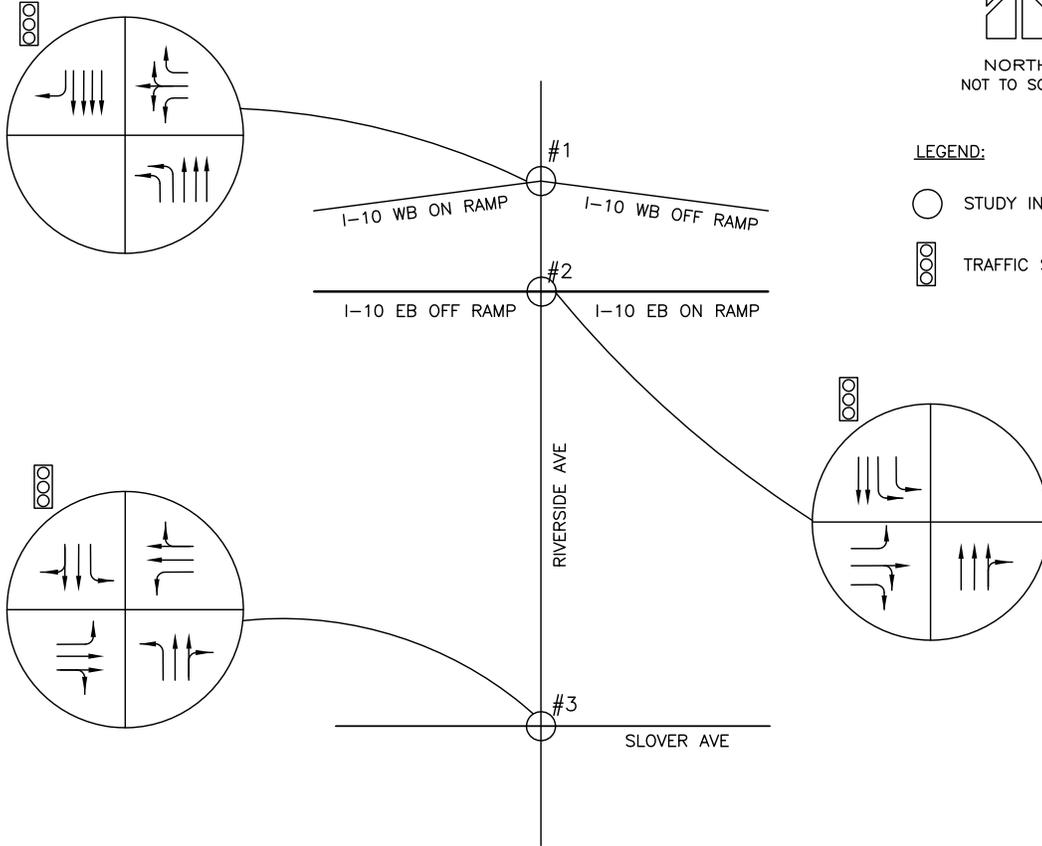


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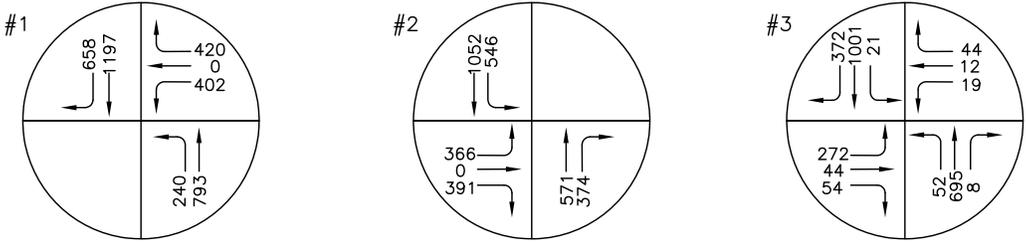
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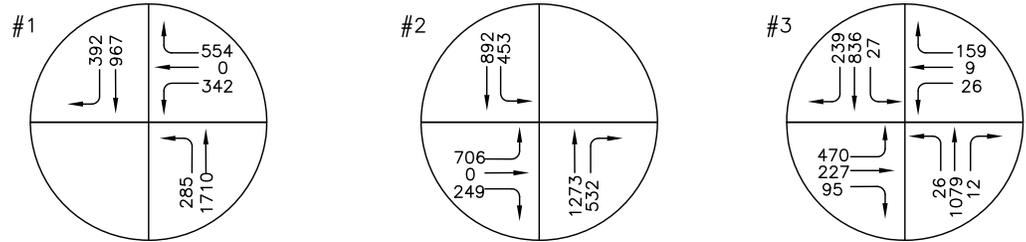
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## PRE-PROJECT COMPLETION TRAFFIC VOLUMES

### EXHIBIT 6

## PROJECT COMPLETION (EXISTING + AMBIENT BACKGROUND GROWTH + PROJECT)

Year 2021 traffic volumes after project completion are illustrated in **Exhibit 7**. The level of services and intersection delays are shown in **Table 5**. Analysis worksheets can be found in **Appendix B**.

**Table 5. Project Completion Traffic Conditions**

Intersection	AM Peak LOS	AM Peak Delay	PM Peak LOS	PM Peak Delay
1. Riverside Ave at I-10 WB Ramps	D	49.0 Sec	C	35.0 Sec
2. Riverside Ave at I-10 EB Ramps	C	30.1 Sec	F*	31.4 Sec
3. Riverside Ave at Slover Ave	D	43.4 Sec	E	64.5 Sec

\* Level of Service F is reported based on field observations of excessive northbound queues extending from I-10 Eastbound Ramps to Slover Avenue.

According to the General Plan 2010, the acceptable level of service is LOS E for Riverside Avenue south of Metrolink tracks in the City of Rialto.

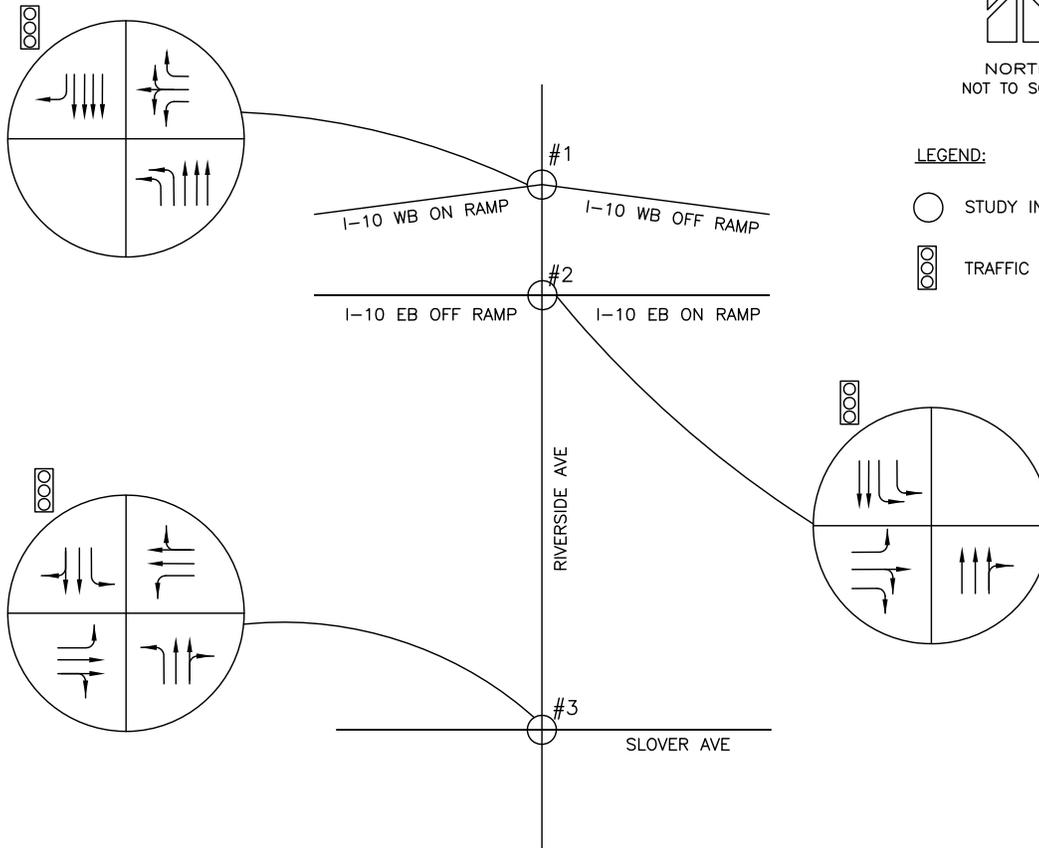


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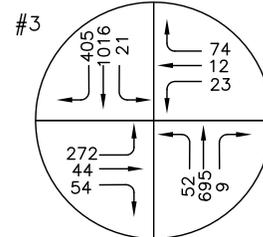
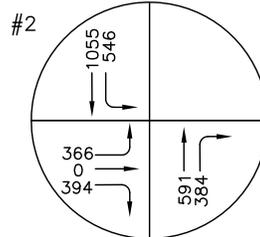
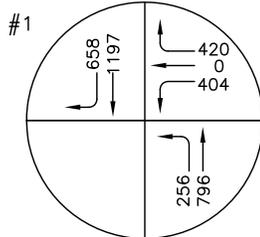
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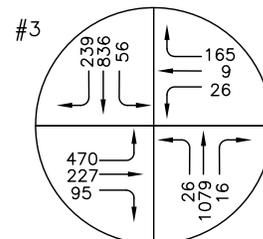
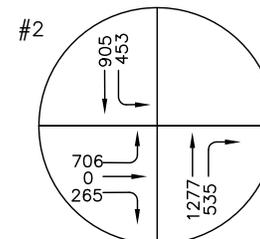
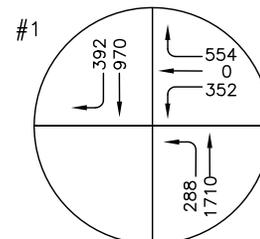
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PROJECT COMPLETION  
TRAFFIC VOLUMES

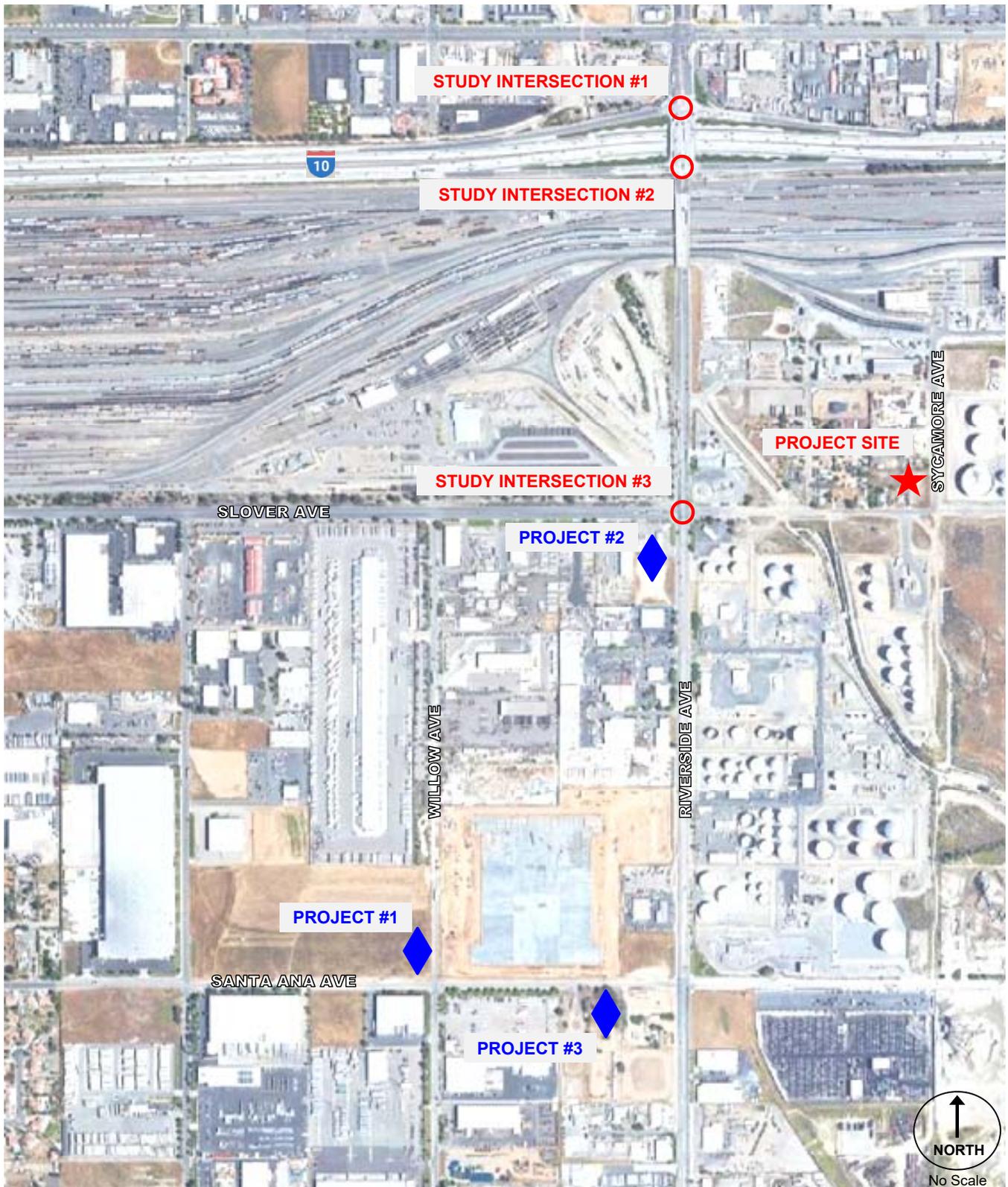
EXHIBIT 7

## OTHER DEVELOPMENTS

Based on information provided by the City of Rialto, other approved developments within a one-mile radius from the study intersections are shown in **Table 6**. The locations of these other approved projects are illustrated in **Exhibit 8**. Traffic volumes generated by other approved projects in the study area are identified in **Exhibit 9**.

**Table 6. Trip Generation By Other Development**

Related Project	AM Peak			PM Peak			Daily
	Total	IN	OUT	Total	IN	OUT	
<b>1. Master Case #2019-0068: Old Dominion</b> Expansion of an existing truck terminal	60	21	39	55	37	18	1,032
<b>2. Two Restaurants: Cowboy Jr. and Zendejas</b> Development of a 2,570 sf. restaurant with drive-thru service (Cowboy Jr.) and a 2,336 sf. restaurant building with drive-thru service (Zendejas)	98	50	48	121	63	58	1,732
<b>3. SC Fuels Rialto</b> Development of a warehouse/office building with a 48,103 square feet primary warehouse area (including 6,440 square feet office and 41,663 square feet warehouse/storage), and a truck servicing area (mechanic shop) with 6,357 square feet.	329	169	160	371	177	194	1,862



**EXHIBIT 8. LOCATION OF OTHER DEVELOPMENTS**

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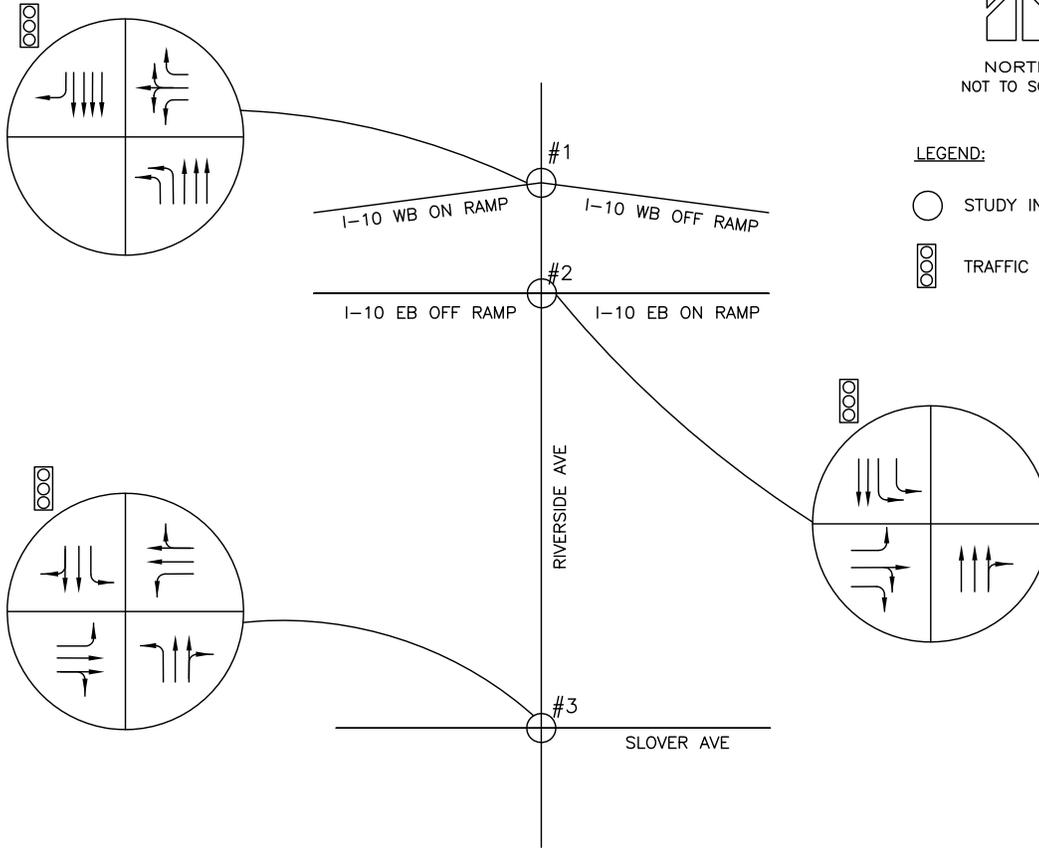


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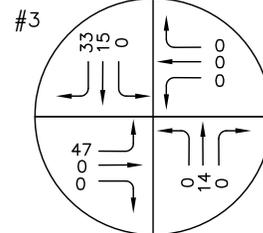
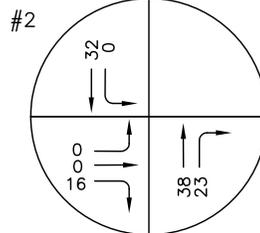
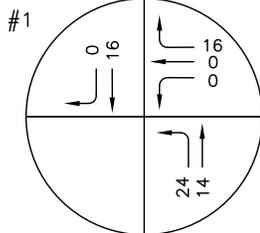
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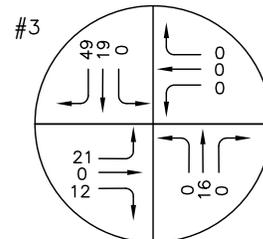
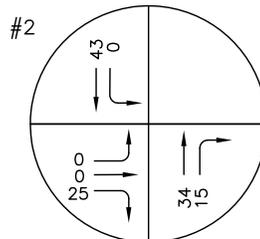
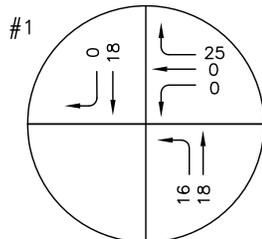
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## TRAFFIC VOLUMES OF OTHER DEVELOPMENTS

### EXHIBIT 9

## CUMULATIVE CONDITIONS (EXISTING + GROWTH + PROJECT + CUMULAIVE)

Traffic generated by other approved projects in the study area are added to the Project Completion traffic and shown as Cumulative Conditions, as shown in **Exhibits 10**. The project's level of significance of traffic impact for the cumulative conditions are shown in **Table 7**. Both study intersections operate at LOS C or better for AM and PM peak hours.

**Table 7. Cumulative Traffic Conditions**

Intersection	AM Peak LOS	AM Peak Delay	PM Peak LOS	PM Peak Delay
1. Riverside Ave at I-10 WB Ramps	D	51.6 Sec	D	39.7 Sec
2. Riverside Ave at I-10 EB Ramps	C	33.3 Sec	F*	33.8 Sec
3. Riverside Ave at Slover Ave	D	54.0 Sec	E	73.8 Sec

\* Level of Service F is reported based on field observations of northbound queues extending from I-10 Eastbound Ramps to Slover Avenue

According to the General Plan 2010, the acceptable level of service is LOS E for Riverside Avenue south of Metrolink tracks in the City of Rialto.

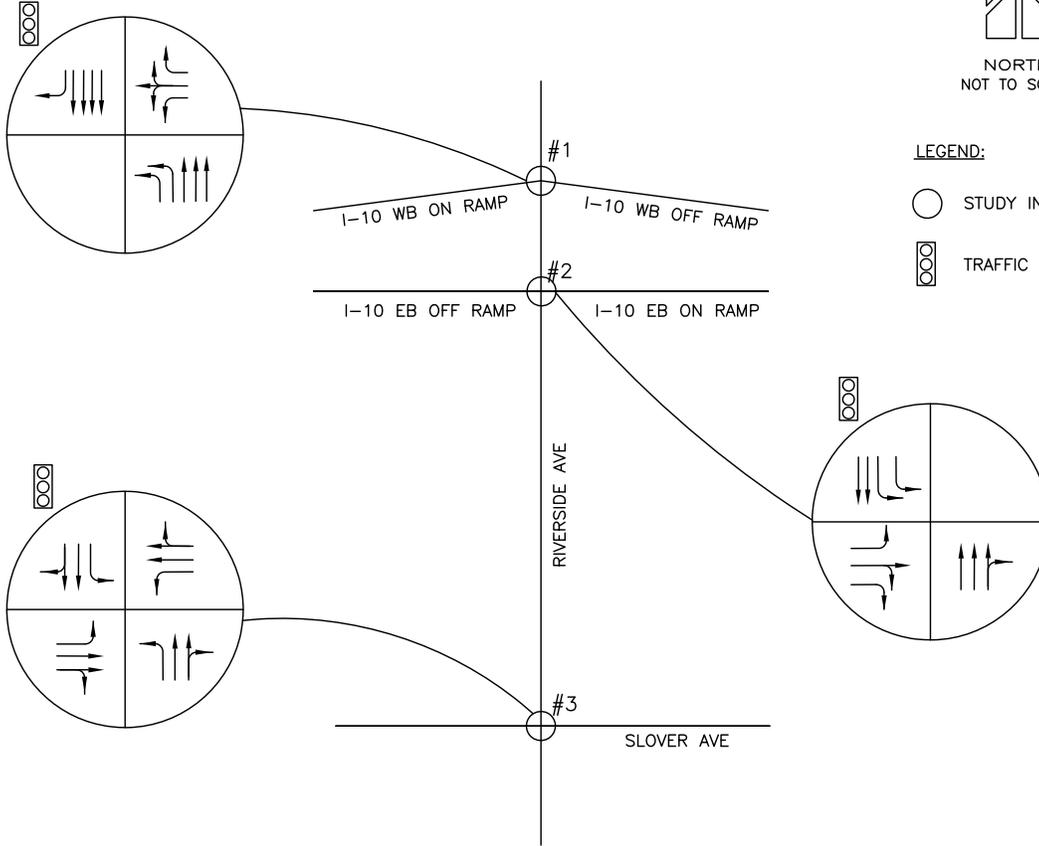


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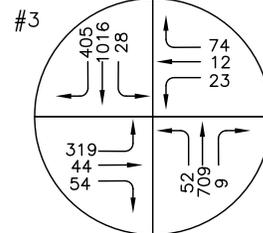
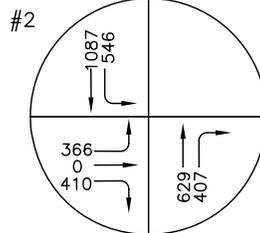
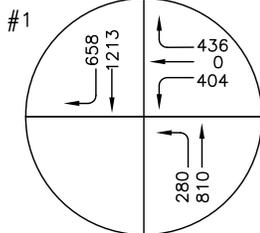
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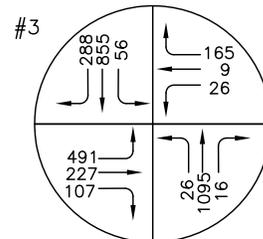
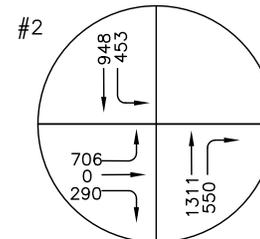
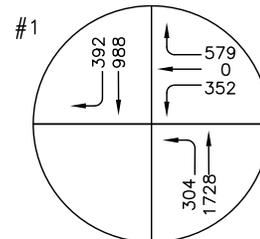
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AM  
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PM  
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CUMULATIVE CONDITIONS

EXHIBIT 10

## THRESHOLD OF SIGNIFICANT IMPACT

According to the City of Rialto "*Traffic Impact Analysis Report Guidelines and Requirements, December 2013,*" significant impacts are deemed to occur at any intersection in which the project causes the LOS to fall below level E for Riverside Avenue or the peak hour delay increases as follows:

**Table 8. Significant Impact Threshold**

LOS	Significant Impact Threshold
A/B	10.0 seconds
C	8.0 seconds
D	5.0 seconds
E	2.0 seconds
F	1.0 seconds

Project's traffic impacts are shown in **Table 9**.

**Table 9. Project Impact Analysis**

Intersection	Pre-Project Conditions		Post Project Conditions		Acceptable LOS E or better	Delay Increase	Significant Impact
	LOS	Delay	LOS	Delay			
<b>AM PEAK</b>							
1. Riverside Ave at I-10 WB Ramps	D	47.6	D	49.0	Yes	1.4 (<5)	No
2. Riverside Ave at I-10 EB Ramps	C	29.2	C	30.1	Yes	0.9 (<8)	No
3. Riverside Ave at Slover Ave	D	42.5	D	43.4	Yes	0.9 (<5)	No
<b>PM PEAK</b>							
1. Riverside Ave at I-10 WB Ramps	D	35.0	D	35.0	Yes	0	No
2. Riverside Ave at I-10 EB Ramps	F*	31.0	F*	31.4	No	0.4 (<1)	No
3. Riverside Ave at Slover Ave	E	63.4	E	64.5	Yes	1.2 (<2)	No

\* Level of Service F is reported based on field observations of excessive northbound queues extending from I-10 Eastbound Ramps to Slover Avenue.

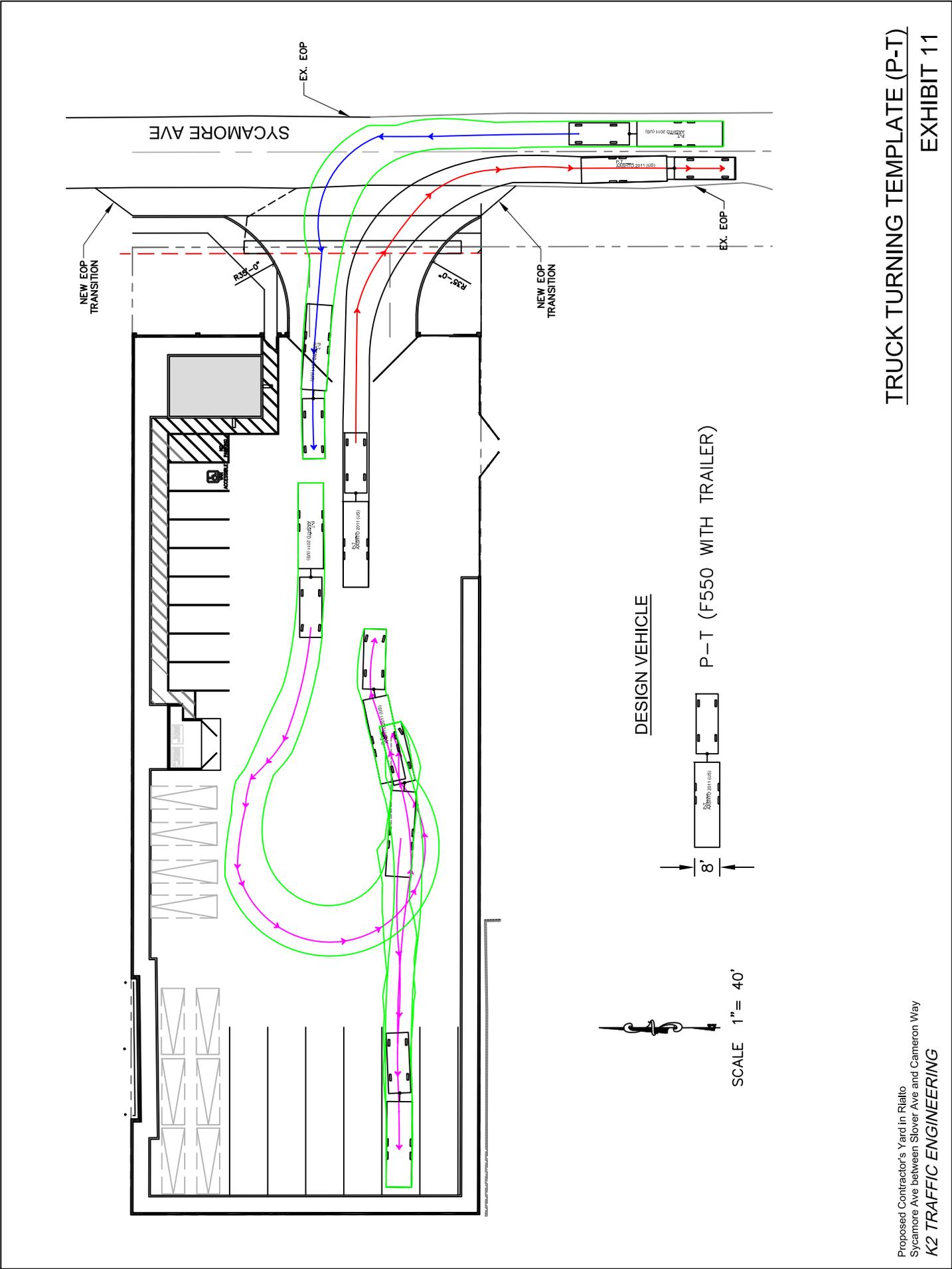
According to the General Plan 2010, the acceptable level of service is LOS E for Riverside Avenue south of Metrolink tracks in the City of Rialto. With consideration of the threshold for significant impacts, the project will have no or less than significant impact. Nonetheless, the project is required to have a fair-share contribution to the planned widening improvement of Riverside Avenue to alleviate the excessive queues observed as pre-existing conditions.

## **FAIR SHARE CONTRIBUTION**

The City of Rialto is planning for widening improvements of Riverside Avenue to a 6-lane roadway with raised medians and additional turn lanes. The City's Local Traffic DIF (Development Impact Fee) Update Report determined that the fair-share mitigation fee is a flat rate of \$375.50 per average daily trips (ADT) to be generated by each project that is required to mitigate its traffic impacts on area streets and intersections. The project is projected to generate 80 daily trips (ADT) as discussed in the trip generation section of this report. Therefore, the project's fair-share contribution calculated based on the DIF rate is \$30,040 (i.e.,  $\$375.50 \times 80 = \$30,040$ ).

## **SITE ACCESS AND ON-SITE CIRCULATION**

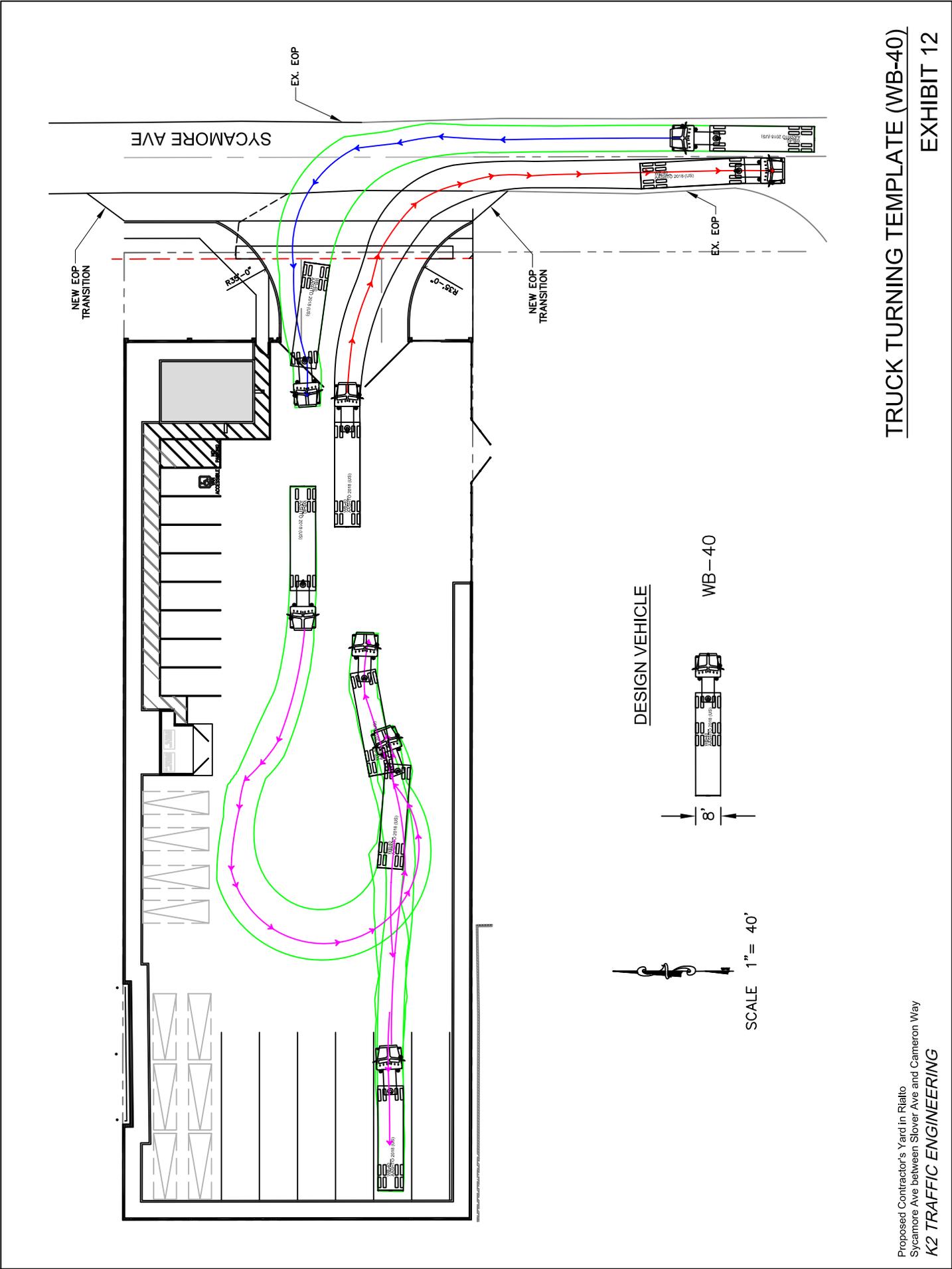
The site access is provided by a new driveway of 40 feet wide on Sycamore Avenue. Site access is apparently adequate and safe. The site circulation with truck turning template is shown in **Exhibit 11** and **Exhibit 12**. On-site circulation appears efficient and safe without bottleneck. Nonetheless, site plan is subject to review and approval by the Fire Department, Planning Department and Traffic Engineer. Truck turning templates for the intersection of Sycamore Avenue and Slover Avenue is shown in **Exhibit 13**.



**TRUCK TURNING TEMPLATE (P-T)**

**EXHIBIT 11**

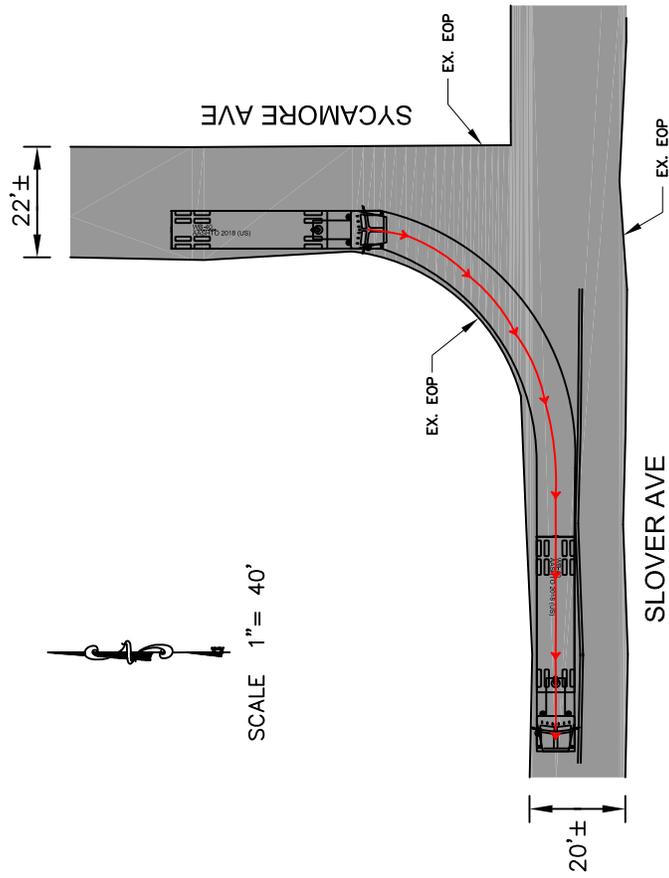
Proposed Contractor's Yard in Riatio  
 Sycamore Ave between Slover Ave and Cameron Way  
**K2 TRAFFIC ENGINEERING**



**TRUCK TURNING TEMPLATE (WB-40)**

**EXHIBIT 12**

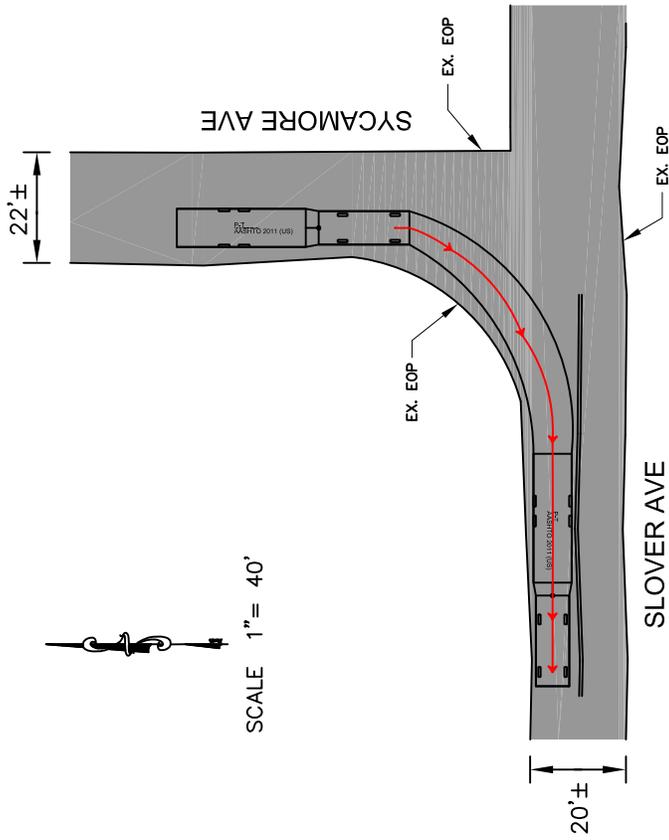
Proposed Contractor's Yard in Rialto  
 Sycamore Ave between Slover Ave and Cameron Way  
**K2 TRAFFIC ENGINEERING**



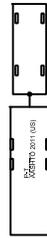
DESIGN VEHICLE



WB-40



DESIGN VEHICLE



P-T (F550 WITH TRAILER)

TRUCK TURNING TEMPLATE  
SYCAMORE AVE AT SLOVER AVE  
 EXHIBIT 13

## **APPENDIX A**

# **APPROVED SCOPING AGREEMENT**

PC # 3  
Onyx Paving

### 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 December 2013.

### City of Rialto Traffic Impact Analysis Scoping Agreement

Case No. \_\_\_\_\_

Related Cases -

SP No. \_\_\_\_\_

EIR No. \_\_\_\_\_

GPA No. \_\_\_\_\_

ZC No. \_\_\_\_\_

Project Name: Contractor's Yard

Project Address: Northwest corner of Sycamore Ave and Slover Ave (APN 0254-142-15)

Project Description: Construct a contractor's yard for equipment storage and a two-story management building of 1,200 sq.ft. See EXHIBIT 1.

#### Consultant

#### Developer

Name: K2 Traffic Engineering, Inc. by Kay Hsu, PE, TE

AFS Investment LLC, Anthony Steen

Address: 1442 Irvine Blvd, Ste 210, Tustin, CA 92780

2005 S. Date Ave, Bloomington, CA 92316

Telephone: 714-832-2116

951-750-2736

Email: kay@k2traffic.com

afs@lms-transport.com

**1. Trip Generation Source:** See EXHIBIT 2.

Existing GP Land Use Industrial Proposed Land Use Industrial

Current Zoning: H-IND Proposed Zoning: H-IND

Total Daily Project Trips: 80

	Current Trip Generation			Proposed Trip Generation		
	In	Out	Total	In	Out	Total
AM Trips	<u>0</u>	<u>0</u>	<u>0</u>	<u>7</u>	<u>33</u>	<u>40</u>
PM Trips	<u>0</u>	<u>0</u>	<u>0</u>	<u>33</u>	<u>7</u>	<u>40</u>
Internal Trip Allowance	Yes	No	<u>0</u>	% Trip Discount)		
Pass-By Trip Allowance	Yes	No	<u>0</u>	% 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.

**2. Trip Geographic Distribution:** N 10 % S 10 % E 30 % W 50 %

(Detailed exhibits of trip distribution must be attached with Trucks as a separate exhibit) **See Exhibit 3**

**3. Background Growth Traffic**

Project Completion Year: 2021 Annual Background Growth Rate: 2 %

Other Phase Years N/A

Other area projects to be considered: None

(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: N/A

**4. Study Intersections:** (NOTE: Subject to revision after other projects, trip generation and distribution are determined, or comments from other agencies received.)

1. Riverside Ave at I-10 WB Ramps
2. Riverside Ave at I-10 EB Ramps
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_
7. \_\_\_\_\_
8. \_\_\_\_\_
9. \_\_\_\_\_
10. \_\_\_\_\_

**5. Study Roadway Segments:** (NOTE: Subject to revision after other projects, trip generation and distribution are determined, or comments from other agencies received.)

- |               |           |
|---------------|-----------|
| 1. <u>N/A</u> | 6. _____  |
| 2. _____      | 7. _____  |
| 3. _____      | 8. _____  |
| 4. _____      | 9. _____  |
| 5. _____      | 10. _____ |

**6. Other Jurisdictional Impacts**

Is this project within any other Agency's Sphere of Influence or within one-mile of another jurisdictional boundary? YX YES \_\_\_\_\_ NO

If so, name of Jurisdiction: Colton

**7. Site Plan** (please attach 11" x 17" legible copy) See EXHIBIT 1.

**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.)

Project trip generation is less than the threshold of 50 trips in the AM and PM peak hours.

Study area includes freeway interchanges within 2 miles that is designated to take more than 40% of total traffic from the project, irrespective of the total number.

Review on-site circulation and ingress/egress truck turning templates. Provide diagrams to determine impacts.

**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: N/A

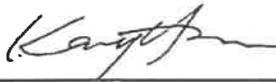
**NOTE Fees are due and must be submitted with, or prior to submittal of this form. The City will not process the Scoping Agreement prior to the receipt of the processing fee.**

Fees Paid: \_\_\_\_\_ Date \_\_\_\_\_

**Recommended:**

Scoping Agreement Submittal date 6/18/2020

Scoping Agreement Resubmittal date 10/5/2020

  
\_\_\_\_\_  
Applicant/Engineer 6/18/2020  
Date

**Land Use Concurrence:**

  
\_\_\_\_\_  
Development Services Department 10-20-2020  
Date

**Approved by:**

*MP for Recommendation Signature*  
*10.19.20*  
\_\_\_\_\_  
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.





June 9, 2020

Anthony Steen  
AFS Investment LLC  
2005 S. Date Ave  
Bloomington, CA 92316

**Re: Trip Generation – Contractor’s Yard for Pavement Rehab Company  
Sycamore Ave, Rialto (APN 0254-142-15)**

Dear Anthony,

Per your request, I have conducted an assessment of trip generation for the proposed contractor’s yard. This technical memorandum presents my findings and recommendations.

**PROJECT DEVELOPMENT**

The site (APN 0254-142-15) is situated on the west side of Sycamore Avenue in the City of Rialto, north of Slover Avenue. The project site is zoned Heavy Industrial and currently vacant and unimproved. The project will construct a two-story management building of 1,200 square feet. Proposed site plan is shown in **Exhibit 1**.

**PROPOSED OPERATION**

The Company plans to operate a contractor’s yard that stores various off-road construction equipment including pavers, rollers, skip loaders, and skid steers as well as construction vehicles such as dump trucks, tractors, trailers, and pickup trucks. Proposed hours of operation are generally from 6 am to 7 pm, seven days a week, although most Sundays will be closed. In the morning these trucks will haul off-road construction equipments with trailers to a remote job site and return to the yard when the job is done. The company estimates that no more than seven (7) employee’s vehicles will be driven to the site on a daily basis. Vehicle inventory is shown in **Table 1**.

**Table 1. Vehicle Inventory**

Vehicle	Truck Axle	Quantity	Note
Freightliner Cascadia Day Cab Tractor & 48-ft Trailer	5	1	3-Axle tractors pull 46-ft trailers (2-Axle) and haul "off-road" construction equipment to job sites.
Freightliner Super Ten	3	1	3-Axle Dump Trucks
Ford F550 & 26-ft Trailer	4	6	2-Axle pickups pull 26-ft trailers (2-Axle) and haul "off-road" construction equipment to job sites.
Ford F150	-	10	Crew trucks and Foreman trucks
Employee's Vehicle	-	7	Passenger cars

**TRIP GENERATION**

This project anticipates the generation of truck traffic and all truck trips are converted into passenger car equivalents (PCE) based on the classification and number of axles, as shown in Table 2. For the purpose of evaluating overall trip generation, this analysis follows the common practice that classifies pickup trucks such as Ford F150 as passenger cars.

**Table 2. Trip Generation with PCE Conversion**

Classification	PCE*	Quantity	AM Peak (7 – 9 AM)		PM Peak (4-6 PM)		Daily
			IN	OUT	IN	OUT	
Truck: 4-axel plus	3	7	-	21	21	-	42
Truck: 3-axel	2	1	-	2	2	-	4
Truck: 2-axel	1.5	-	-	-	-	-	-
Passenger Car: Pickup	1	10	-	10	10	-	20
Passenger Car: Employee	1	7	7	-	-	7	14
<b>Trip Generation with PCE Conversion</b>			<b>7</b>	<b>33</b>	<b>33</b>	<b>7</b>	<b>80</b>

\* Per City of Rialto Traffic Impact Study Guidelines

**SUMMARY**

With consideration of PCE conversion, the project is expected to generate an equivalent of 40 trips in the AM peak hour, including 7 inbound and 33 outbound trips, 40 trips in the PM peak hour, including 33 inbound and 7 outbound trips, and 80 daily trips.

Regards,

***K2 Traffic Engineering, Inc.***



**Jende Kay Hsu, T.E.  
California License TR2285**

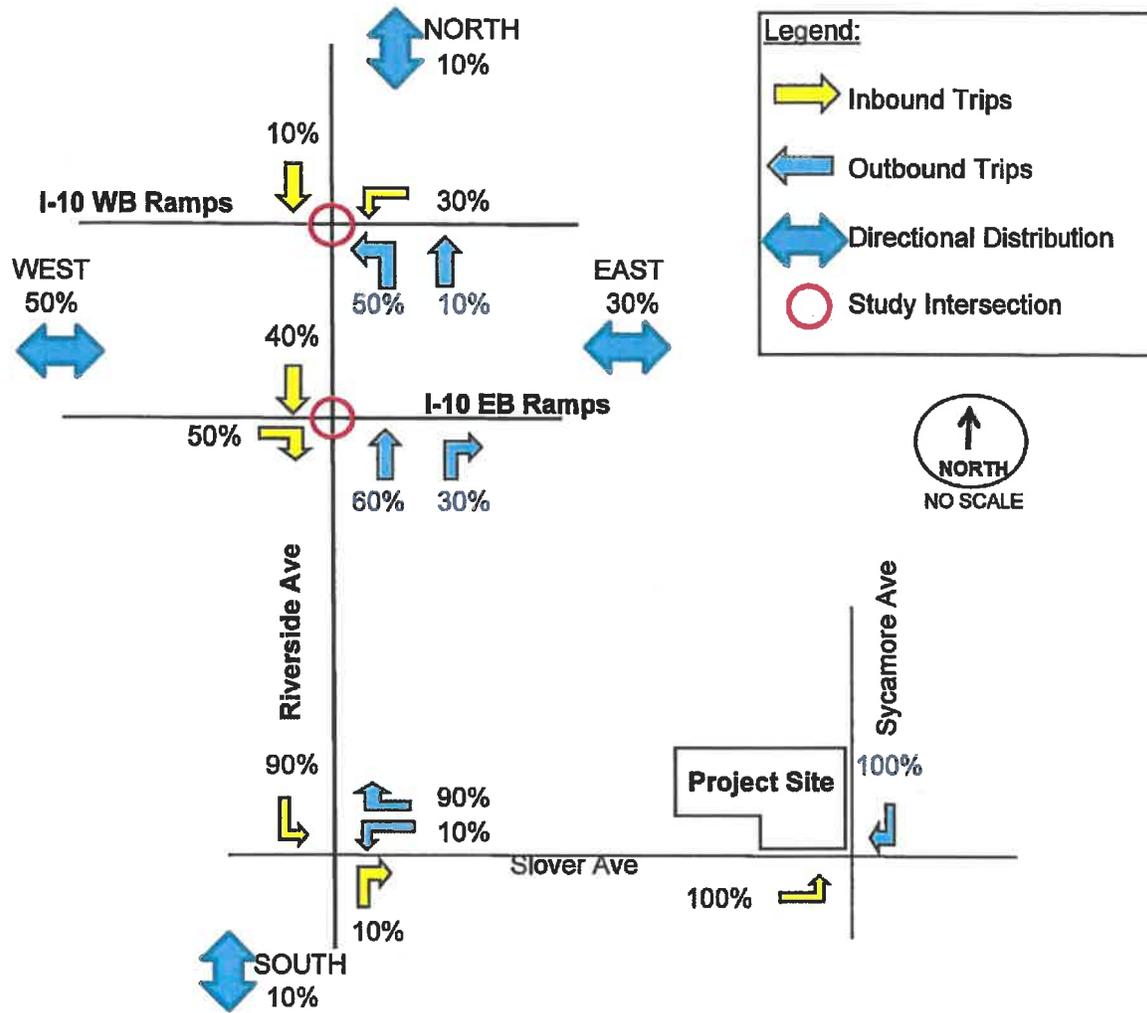


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***K2 Traffic Engineering, Inc.***

1442 Irvine Blvd, Suite 210, Tustin, CA 92780 T.714-832-2116 Email: [kay@k2traffic.com](mailto:kay@k2traffic.com)

**EXHIBIT 3. TRIP DISTRIBUTION**



## **APPENDIX B**

### **TRAFFIC COUNT DATA**

# INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: PACIFIC TRAFFIC DATA SERVICES

**DATE:**  
11/5/20  
THURSDAY

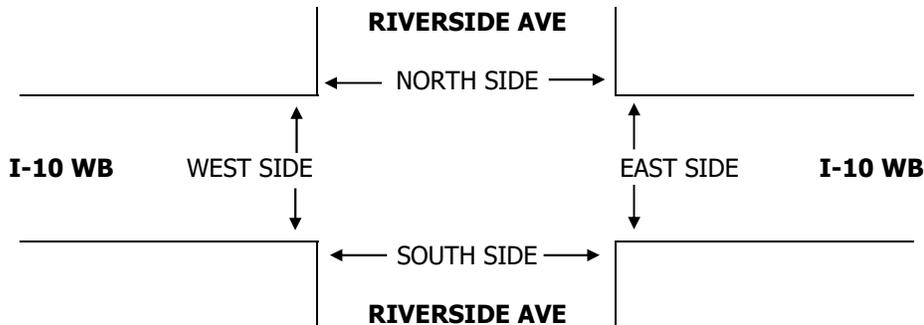
**LOCATION:**  
NORTH & SOUTH: **RIALTO RIVERSIDE AVE**  
EAST & WEST: **I-10 WB**

**PROJECT #:**  
**LOCATION #:** 1  
**CONTROL:** SIGNAL

NOTES:	AM		▲	
	PM		N	
	MD	◀ W		E ▶
	OTHER		S	
	OTHER		▼	

	NORTHBOUND RIVERSIDE AVE			SOUTHBOUND RIVERSIDE AVE			EASTBOUND I-10 WB			WESTBOUND I-10 WB			TOTAL
	LANES:	NL 2	NT 3	NR X	SL X	ST 4	SR 1	EL X	ET X	ER X	WL 1.5	WT 0.5	

<b>AM</b>	7:00 AM	47	117			137	75				105	1	56	538
	7:15 AM	54	141			166	70				77	0	47	555
	7:30 AM	61	159			142	116				90	0	75	643
	7:45 AM	45	168			136	74				106	0	56	585
	8:00 AM	52	132			142	71				102	0	63	562
	8:15 AM	51	141			203	50				54	0	68	567
	8:30 AM	55	158			145	63				90	0	55	566
	8:45 AM	68	153			155	67				74	0	70	587
	VOLUMES	433	1,169	0	0	1,226	586	0	0	0	698	1	490	4,603
	APPROACH %	27%	73%	0%	0%	68%	32%	0%	0%	0%	59%	0%	41%	
APP/DEPART	1,602	/	1,659	1,812	/	1,924	0	/	0	1,189	/	1,020	0	
BEGIN PEAK HR	7:30 AM													
VOLUMES	209	600	0	0	623	311	0	0	0	352	0	262	2,357	
APPROACH %	26%	74%	0%	0%	67%	33%	0%	0%	0%	57%	0%	43%		
PEAK HR FACTOR	0.919			0.905			0.000			0.930			0.916	
APP/DEPART	809	/	862	934	/	975	0	/	0	614	/	520	0	
<b>PM</b>	4:00 PM	72	318			220	42				76	0	81	809
	4:15 PM	72	337			213	49				96	0	99	866
	4:30 PM	62	321			189	68				83	0	92	815
	4:45 PM	60	364			153	72				96	0	102	847
	5:00 PM	67	328			217	64				96	2	83	857
	5:15 PM	60	326			208	69				96	0	72	831
	5:30 PM	73	301			201	67				88	0	58	788
	5:45 PM	77	306			183	87				71	0	89	813
	VOLUMES	543	2,601	0	0	1,584	518	0	0	0	702	2	676	6,626
	APPROACH %	17%	83%	0%	0%	75%	25%	0%	0%	0%	51%	0%	49%	
APP/DEPART	3,144	/	3,277	2,102	/	2,286	0	/	0	1,380	/	1,063	0	
BEGIN PEAK HR	4:15 PM													
VOLUMES	261	1,350	0	0	772	253	0	0	0	371	2	376	3,385	
APPROACH %	16%	84%	0%	0%	75%	25%	0%	0%	0%	50%	0%	50%		
PEAK HR FACTOR	0.950			0.912			0.000			0.946			0.977	
APP/DEPART	1,611	/	1,726	1,025	/	1,143	0	/	0	749	/	516	0	



# INTERSECTION TURNING MOVEMENT COUNTS

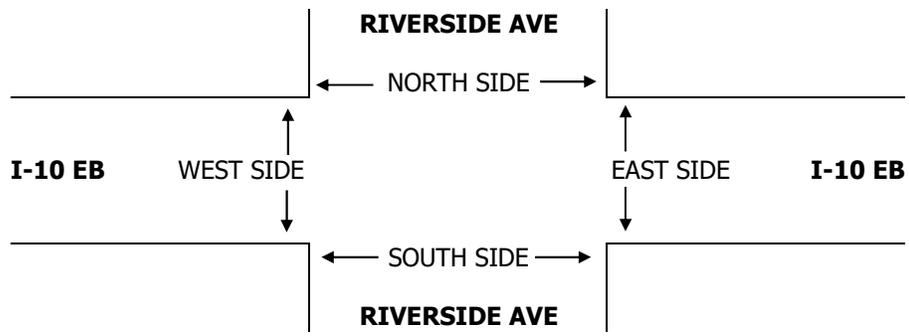
PREPARED BY: PACIFIC TRAFFIC DATA SERVICES

<b>DATE:</b> 11/5/20 THURSDAY	<b>LOCATION:</b> NORTH & SOUTH: EAST & WEST:	RIALTO RIVERSIDE AVE I-10 EB	<b>PROJECT #:</b> <b>LOCATION #:</b> 2 <b>CONTROL:</b> SIGNAL
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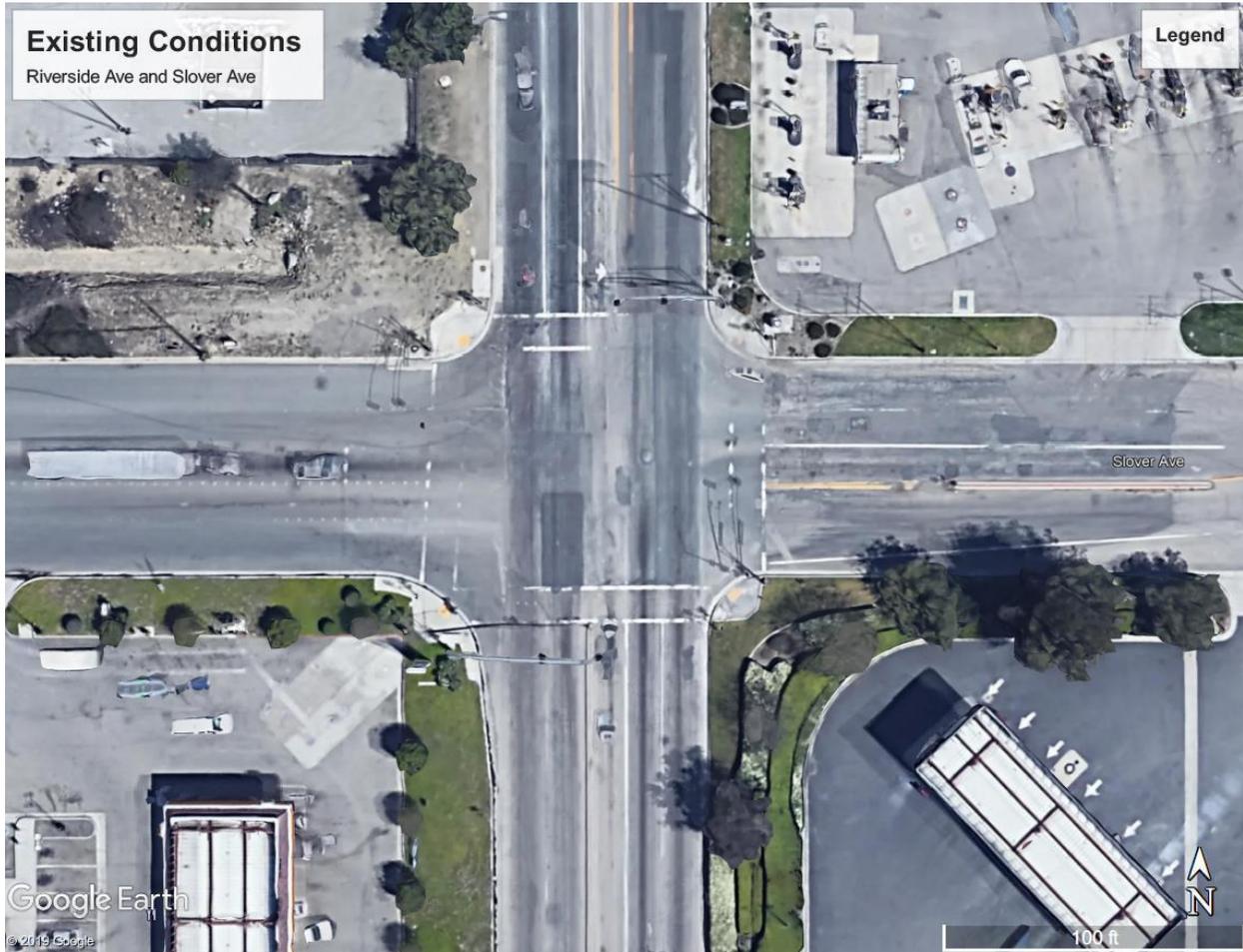
NOTES:	AM PM MD OTHER OTHER	◀ W E ▶	▲ N S ▼
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LANES:	NORTHBOUND RIVERSIDE AVE			SOUTHBOUND RIVERSIDE AVE			EASTBOUND I-10 EB			WESTBOUND I-10 EB			TOTAL
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	
	X	2.5	0.5	2	2	X	1.5	0.5	1	X	X	X	

<b>AM</b>	7:00 AM		120	84	80	153		51	0	75				563
	7:15 AM		135	86	96	163		58	0	62				600
	7:30 AM		134	92	92	131		78	1	66				594
	7:45 AM		158	121	82	154		61	0	56				632
	8:00 AM		115	84	78	156		59	0	73				565
	8:15 AM		134	82	104	172		64	0	64				620
	8:30 AM		133	83	89	128		75	1	61				570
	8:45 AM		163	117	82	154		61	0	54				631
	VOLUMES	0	1,092	749	703	1,211	0	507	2	511	0	0	0	4,775
	APPROACH %	0%	59%	41%	37%	63%	0%	50%	0%	50%	0%	0%	0%	
APP/DEPART	1,841	/	1,599	1,914	/	1,722	1,020	/	1,454	0	/	0	0	
BEGIN PEAK HR	7:30 AM													
VOLUMES	0	541	379	356	613	0	262	1	259	0	0	0	2,411	
APPROACH %	0%	59%	41%	37%	63%	0%	50%	0%	50%	0%	0%	0%		
PEAK HR FACTOR	0.824			0.878			0.900			0.000			0.954	
APP/DEPART	920	/	803	969	/	872	522	/	736	0	/	0	0	
<b>PM</b>	4:00 PM		260	123	107	193		142	0	48				873
	4:15 PM		300	107	102	201		104	0	49				863
	4:30 PM		243	108	94	191		129	0	56				821
	4:45 PM		270	117	79	163		140	0	59				828
	5:00 PM		243	133	105	206		144	0	46				877
	5:15 PM		292	105	103	209		109	0	51				869
	5:30 PM		244	105	91	190		124	0	54				808
	5:45 PM		273	121	81	169		120	0	62				826
	VOLUMES	0	2,125	919	762	1,522	0	1,012	0	425	0	0	0	6,765
	APPROACH %	0%	70%	30%	33%	67%	0%	70%	0%	30%	0%	0%	0%	
APP/DEPART	3,044	/	3,137	2,284	/	1,947	1,437	/	1,681	0	/	0	0	
BEGIN PEAK HR	4:30 PM													
VOLUMES	0	1,048	463	381	769	0	522	0	212	0	0	0	3,395	
APPROACH %	0%	69%	31%	33%	67%	0%	71%	0%	29%	0%	0%	0%		
PEAK HR FACTOR	0.952			0.921			0.922			0.000			0.968	
APP/DEPART	1,511	/	1,570	1,150	/	981	734	/	844	0	/	0	0	



## Intersection of Riverside Avenue and Slover Avenue



# CITY TRAFFIC COUNTERS

WWW.CTCOUNTERS.COM

File Name : Riverside\_Slover

Site Code : 00000000

Start Date : 9/26/2019

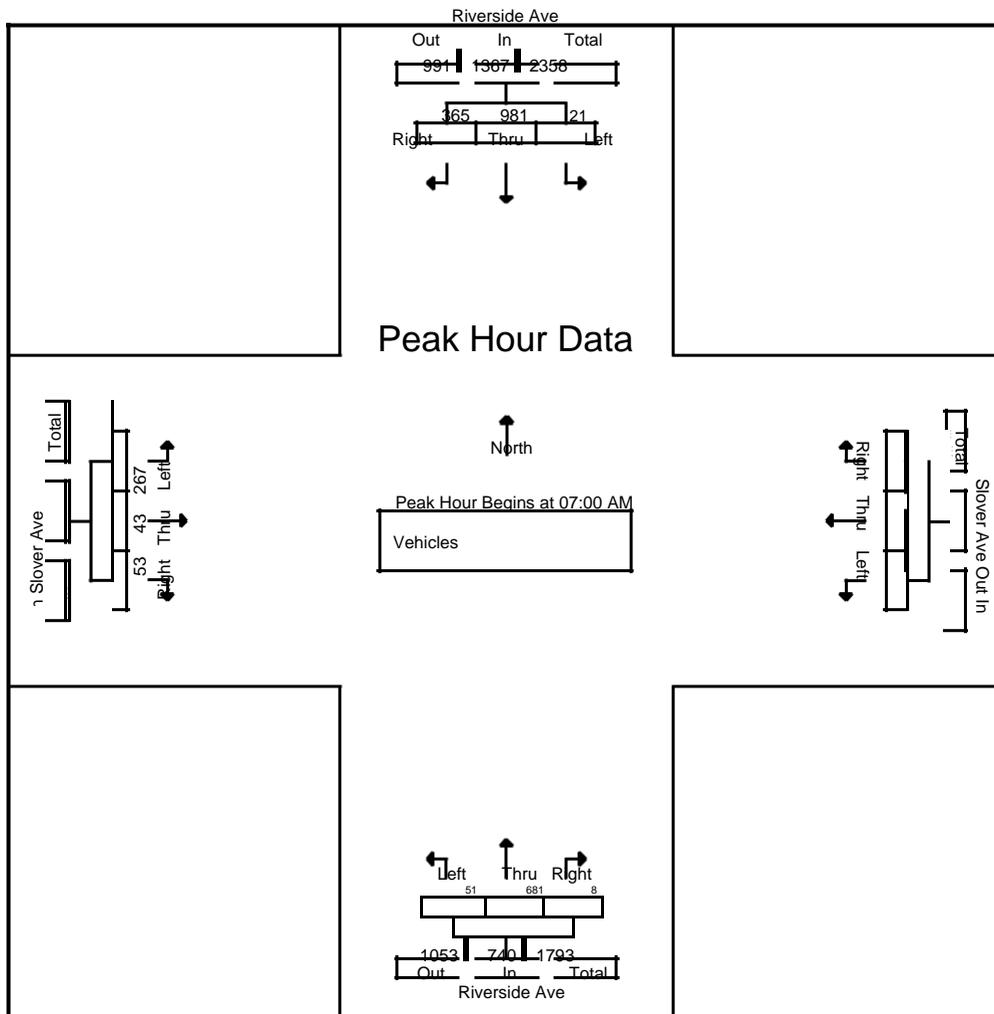
Page No : 1

Start Time	Riverside Ave			Slover Ave			Riverside Ave			Slover Ave			Int. Total
	Southbound		Right	Westbound		Right	Northbound		Right	Left	Eastbound	Right	
07:00 AM	7	220	106	2	3	10	14	167	1	60	9	9	608
07:15 AM	4	248	77	9	2	7	14	165	4	74	5	9	618
07:30 AM	2	244	97	3	5	11	8	164	1	70	15	15	635
07:45 AM	8	269	85	5	2	15	15	185	2	63	14	20	683
08:00 AM	6	230	63	2	1	7	12	176	2	44	3	13	559
08:15 AM	5	254	55	4	1	7	4	194	0	45	9	13	591
08:30 AM	4	212	47	7	1	9	10	199	2	70	5	8	574
08:45 AM	8	205	39	8	4	6	11	191	4	54	4	10	544
04:00 PM	6	193	60	3	6	24	8	267	2	101	44	27	741
04:15 PM	10	167	52	7	3	33	10	253	0	104	56	29	724
04:30 PM	11	208	52	7	2	23	6	266	3	127	44	25	774
04:45 PM	7	223	68	8	1	37	7	265	3	124	50	20	813
05:00 PM	4	182	53	4	2	50	4	275	4	102	80	25	785
05:15 PM	4	207	61	6	4	46	8	252	2	108	49	23	770
05:30 PM	6	162	53	4	1	50	6	250	2	119	85	28	766
05:45 PM	4	170	52	3	2	30	2	253	0	122	32	25	695
Grand Total	96	3394	1020	82	40	365	139	3522	32	1387	504	299	10880
Apprch %	2.1	75.3	22.6	16.8	8.2	74.9	3.8	95.4	0.9	63.3	23	13.7	
Total %	0.9	31.2	9.4	0.8	0.4	3.4	1.3	32.4	0.3	12.7	4.6	2.7	

**CITY TRAFFIC COUNTERS**  
**WWW.CTCOUNTERS.COM**

File Name : Riverside\_Slover  
 Site Code : 00000000  
 Start Date : 9/26/2019  
 Page No : 2

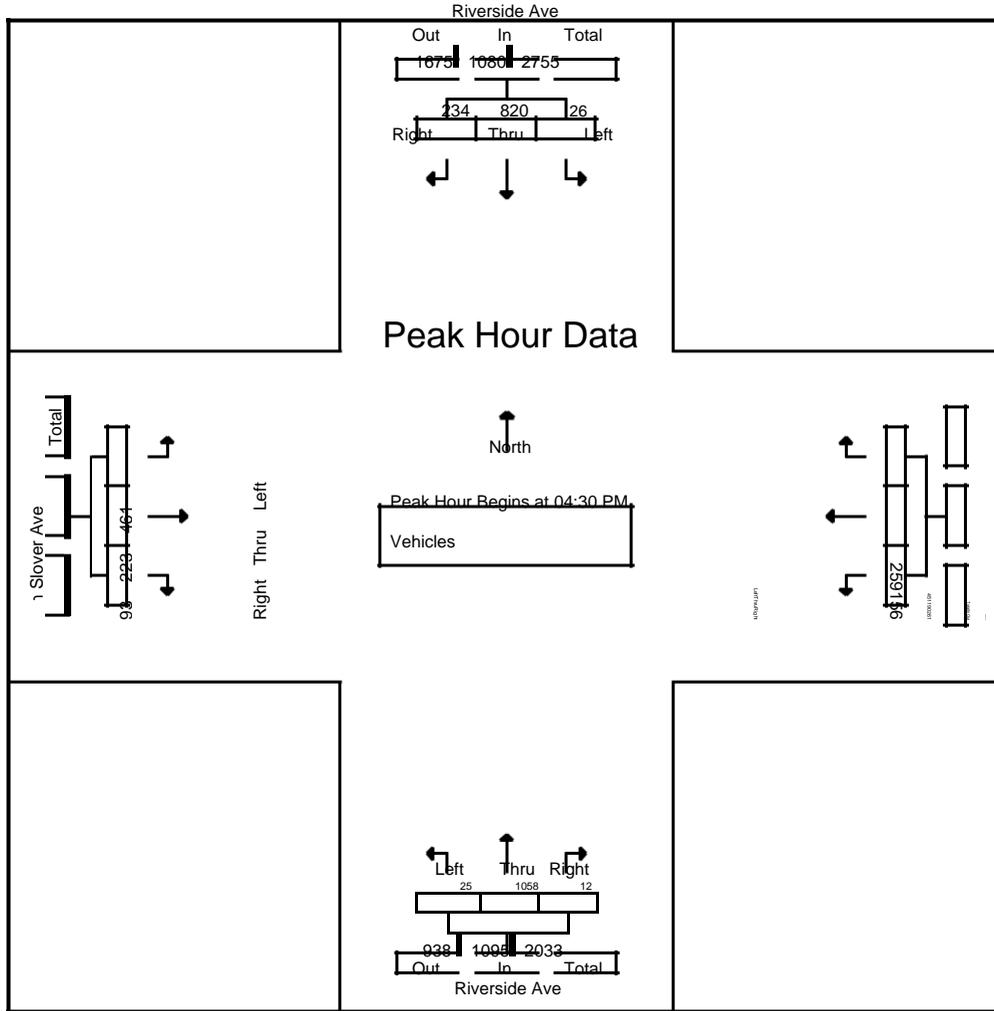
Start Time	Riverside Ave Southbound				Slover Ave Westbound				Riverside Ave Northbound				Slover Ave Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 AM to																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	7	220	106	333	2	3	10	15	14	167	1	182	60	9	9	78	608
07:15 AM	4	248	77	329	9	2	7	18	14	165	4	183	74	5	9	88	618
07:30 AM	2	244	97	343	3	5	11	19	8	164	1	173	70	15	15	100	635
07:45 AM	8	269	85	362	5	2	15	22	15	185	2	202	63	14	20	97	683
% App. Total	1.5	71.8	26.7		25.7	16.2	58.1		6.9	92	1.1		73.6	11.8	14.6		
PHF	.656	.912	.861	.944	.528	.600	.717	.841	.850	.920	.500	.916	.902	.717	.663	.908	.931



**CITY TRAFFIC COUNTERS**  
**WWW.CTCOUNTERS.COM**

File Name : Riverside\_Slover  
 Site Code : 00000000  
 Start Date : 9/26/2019  
 Page No : 3

Start Time	Riverside Ave Southbound				Slover Ave Westbound				Riverside Ave Northbound				Slover Ave Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 12:00 PM to																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	11	208	52	271	7	2	23	32	6	266	3	275	127	44	25	196	774
04:45 PM	7	223	68	298	8	1	37	46	7	265	3	275	124	50	20	194	813
05:00 PM	4	182	53	239	4	2	50	56	4	275	4	283	102	80	25	207	785
05:15 PM	4	207	61	272	6	4	46	56	8	252	2	262	108	49	23	180	770
% App. Total	2.4	75.9	21.7	.906	13.2	4.7	82.1	.848	2.3	96.6	1.1	.967	59.3	28.7	12	.938	.966
PHF	.591	.919	.860		.781	.563	.780		.781	.962	.750		.907	.697	.930		



## **APPENDIX C**

# **LEVEL OF SERVICE ANALYSIS**

HCM 2010 Signalized Intersection Summary  
 1: Riverside Ave & I-10 WB Ramps

02/02/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	394	0	412	235	777	0	0	1173	645
Future Volume (veh/h)	0	0	0	394	0	412	235	777	0	0	1173	645
Number				3	8	18	5	2	12	1	6	16
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
Adj Sat Flow, veh/h/ln				1863	0	1863	1863	1863	0	0	1863	1863
Adj Flow Rate, veh/h				443	0	463	264	873	0	0	1318	725
Adj No. of Lanes				2	0	1	2	2	0	0	4	1
Peak Hour Factor				0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %				2	0	2	2	2	0	0	2	2
Cap, veh/h				1037	0	477	349	1916	0	0	2316	572
Arrive On Green				0.30	0.00	0.30	0.20	1.00	0.00	0.00	0.36	0.36
Sat Flow, veh/h				3442	0	1583	3442	3632	0	0	6669	1583
Grp Volume(v), veh/h				443	0	463	264	873	0	0	1318	725
Grp Sat Flow(s),veh/h/ln				1721	0	1583	1721	1770	0	0	1602	1583
Q Serve(g_s), s				7.2	0.0	20.2	5.1	0.0	0.0	0.0	11.6	25.3
Cycle Q Clear(g_c), s				7.2	0.0	20.2	5.1	0.0	0.0	0.0	11.6	25.3
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				1037	0	477	349	1916	0	0	2316	572
V/C Ratio(X)				0.43	0.00	0.97	0.76	0.46	0.00	0.00	0.57	1.27
Avail Cap(c_a), veh/h				1037	0	477	388	1916	0	0	2316	572
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.81	0.81	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				19.6	0.0	24.1	27.1	0.0	0.0	0.0	18.0	22.3
Incr Delay (d2), s/veh				0.3	0.0	33.5	6.1	0.6	0.0	0.0	1.0	133.4
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				3.4	0.0	13.2	2.6	0.2	0.0	0.0	5.3	32.2
LnGrp Delay(d),s/veh				19.9	0.0	57.6	33.2	0.6	0.0	0.0	19.0	155.8
LnGrp LOS				B		E	C	A			B	F
Approach Vol, veh/h					906			1137			2043	
Approach Delay, s/veh					39.2			8.2			67.5	
Approach LOS					D			A			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		43.4			12.6	30.8		26.6				
Change Period (Y+Rc), s		5.5			5.5	5.5		5.5				
Max Green Setting (Gmax), s		37.9			7.9	24.5		21.1				
Max Q Clear Time (g_c+I1), s		2.0			7.1	27.3		22.2				
Green Ext Time (p_c), s		6.7			0.1	0.0		0.0				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay				44.7								
HCM 2010 LOS				D								

# HCM 2010 Signalized Intersection Summary

## 2: Riverside Ave & I-10 EB Ramps

02/02/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 							  		 	 	
Traffic Volume (veh/h)	359	0	383	0	0	0	0	560	367	535	1031	0
Future Volume (veh/h)	359	0	383	0	0	0	0	560	367	535	1031	0
Number	7	4	14				5	2	12	1	6	16
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
Adj Sat Flow, veh/h/ln	1863	0	1863				0	1863	1900	1863	1863	0
Adj Flow Rate, veh/h	403	0	430				0	629	412	601	1158	0
Adj No. of Lanes	2	0	1				0	3	0	2	2	0
Peak Hour Factor	0.89	0.89	0.89				0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	0	2				0	2	2	2	2	0
Cap, veh/h	1081	0	463				0	969	452	788	2023	0
Arrive On Green	0.31	0.00	0.29				0.00	0.29	0.26	0.15	0.38	0.00
Sat Flow, veh/h	3442	0	1583				0	3558	1583	3442	3632	0
Grp Volume(v), veh/h	403	0	430				0	629	412	601	1158	0
Grp Sat Flow(s),veh/h/ln	1721	0	1583				0	1695	1583	1721	1770	0
Q Serve(g_s), s	6.4	0.0	18.5				0.0	11.4	17.6	11.7	18.1	0.0
Cycle Q Clear(g_c), s	6.4	0.0	18.5				0.0	11.4	17.6	11.7	18.1	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	1081	0	463				0	969	452	788	2023	0
V/C Ratio(X)	0.37	0.00	0.93				0.00	0.65	0.91	0.76	0.57	0.00
Avail Cap(c_a), veh/h	1082	0	464				0	969	452	788	2023	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	0.67	0.67	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	0.84	0.84	0.00
Uniform Delay (d), s/veh	18.7	0.0	24.0				0.0	21.9	24.9	27.8	14.8	0.0
Incr Delay (d2), s/veh	0.2	0.0	25.1				0.0	3.4	25.0	3.7	1.0	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	3.1	0.0	11.2				0.0	5.8	10.8	6.0	9.1	0.0
LnGrp Delay(d),s/veh	18.9	0.0	49.1				0.0	25.3	49.9	31.5	15.8	0.0
LnGrp LOS	B		D					C	D	C	B	
Approach Vol, veh/h		833						1041			1759	
Approach Delay, s/veh		34.5						35.0			21.2	
Approach LOS		C						D			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	20.0	24.0		26.0		44.0						
Change Period (Y+Rc), s	5.5	5.5		5.5		5.5						
Max Green Setting (Gmax), s	14.5	18.5		20.5		38.5						
Max Q Clear Time (g_c+I1), s	13.7	19.6		20.5		20.1						
Green Ext Time (p_c), s	0.3	0.0		0.0		5.6						
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			28.2									
HCM 2010 LOS			C									

HCM 2010 Signalized Intersection Summary  
 3: Riverside Ave & Slove Ave/Slover Ave

02/02/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	267	43	53	19	12	43	51	681	8	21	981	365
Future Volume (veh/h)	267	43	53	19	12	43	51	681	8	21	981	365
Number	7	4	14	3	8	18	5	2	12	1	6	16
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	300	48	60	21	13	48	57	765	9	24	1102	410
Adj No. of Lanes	1	2	0	1	2	0	1	2	0	1	2	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	382	412	369	362	412	369	177	1770	21	66	1096	400
Arrive On Green	0.23	0.23	0.23	0.23	0.23	0.23	0.10	0.49	0.49	0.04	0.43	0.43
Sat Flow, veh/h	1336	1770	1583	1280	1770	1583	1774	3583	42	1774	2541	928
Grp Volume(v), veh/h	300	48	60	21	13	48	57	378	396	24	761	751
Grp Sat Flow(s),veh/h/ln	1336	1770	1583	1280	1770	1583	1774	1770	1855	1774	1770	1699
Q Serve(g_s), s	14.6	1.5	2.1	0.9	0.4	1.7	2.1	9.6	9.6	0.9	30.0	30.2
Cycle Q Clear(g_c), s	16.3	1.5	2.1	3.0	0.4	1.7	2.1	9.6	9.6	0.9	30.0	30.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.02	1.00		0.55
Lane Grp Cap(c), veh/h	382	412	369	362	412	369	177	874	917	66	763	733
V/C Ratio(X)	0.79	0.12	0.16	0.06	0.03	0.13	0.32	0.43	0.43	0.36	1.00	1.02
Avail Cap(c_a), veh/h	382	412	369	362	412	369	177	874	917	177	763	733
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	28.2	21.2	21.4	22.6	20.8	21.2	29.3	11.4	11.4	32.9	19.9	19.9
Incr Delay (d2), s/veh	10.3	0.1	0.2	0.1	0.0	0.2	1.0	1.6	1.5	3.3	31.8	39.6
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	6.8	0.7	0.9	0.3	0.2	0.7	1.1	5.0	5.2	0.5	21.3	22.1
LnGrp Delay(d),s/veh	38.5	21.3	21.6	22.7	20.8	21.4	30.3	12.9	12.9	36.2	51.7	59.5
LnGrp LOS	D	C	C	C	C	C	C	B	B	D	D	F
Approach Vol, veh/h		408			82			831			1536	
Approach Delay, s/veh		34.0			21.6			14.1			55.3	
Approach LOS		C			C			B			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.1	40.1		21.8	12.5	35.7		21.8				
Change Period (Y+Rc), s	5.5	5.5		5.5	5.5	5.5		5.5				
Max Green Setting (Gmax), s	7.0	30.2		16.3	7.0	30.2		16.3				
Max Q Clear Time (g_c+I1), s	2.9	11.6		18.3	4.1	32.2		5.0				
Green Ext Time (p_c), s	0.0	4.7		0.0	0.0	0.0		0.2				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay				39.3								
HCM 2010 LOS				D								

# HCM 2010 Signalized Intersection Summary

## 1: Riverside Ave & I-10 WB Ramps

02/02/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	402	0	420	240	793	0	0	1197	658
Future Volume (veh/h)	0	0	0	402	0	420	240	793	0	0	1197	658
Number				3	8	18	5	2	12	1	6	16
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
Adj Sat Flow, veh/h/ln				1863	0	1863	1863	1863	0	0	1863	1863
Adj Flow Rate, veh/h				452	0	472	270	891	0	0	1345	739
Adj No. of Lanes				2	0	1	2	2	0	0	4	1
Peak Hour Factor				0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %				2	0	2	2	2	0	0	2	2
Cap, veh/h				1037	0	477	354	1916	0	0	2306	570
Arrive On Green				0.30	0.00	0.30	0.21	1.00	0.00	0.00	0.36	0.36
Sat Flow, veh/h				3442	0	1583	3442	3632	0	0	6669	1583
Grp Volume(v), veh/h				452	0	472	270	891	0	0	1345	739
Grp Sat Flow(s),veh/h/ln				1721	0	1583	1721	1770	0	0	1602	1583
Q Serve(g_s), s				7.4	0.0	20.8	5.2	0.0	0.0	0.0	11.9	25.2
Cycle Q Clear(g_c), s				7.4	0.0	20.8	5.2	0.0	0.0	0.0	11.9	25.2
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				1037	0	477	354	1916	0	0	2306	570
V/C Ratio(X)				0.44	0.00	0.99	0.76	0.46	0.00	0.00	0.58	1.30
Avail Cap(c_a), veh/h				1037	0	477	388	1916	0	0	2306	570
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.80	0.80	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				19.7	0.0	24.3	27.0	0.0	0.0	0.0	18.1	22.4
Incr Delay (d2), s/veh				0.3	0.0	38.2	6.4	0.6	0.0	0.0	1.1	146.2
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				3.6	0.0	14.1	2.7	0.2	0.0	0.0	5.4	34.1
LnGrp Delay(d),s/veh				20.0	0.0	62.5	33.4	0.6	0.0	0.0	19.2	168.6
LnGrp LOS				B		E	C	A			B	F
Approach Vol, veh/h					924			1161			2084	
Approach Delay, s/veh					41.7			8.3			72.2	
Approach LOS					D			A			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		43.4			12.7	30.7		26.6				
Change Period (Y+Rc), s		5.5			5.5	5.5		5.5				
Max Green Setting (Gmax), s		37.9			7.9	24.5		21.1				
Max Q Clear Time (g_c+I1), s		2.0			7.2	27.2		22.8				
Green Ext Time (p_c), s		6.9			0.1	0.0		0.0				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay				47.6								
HCM 2010 LOS				D								

# HCM 2010 Signalized Intersection Summary

## 2: Riverside Ave & I-10 EB Ramps

02/02/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 							  		 	 	
Traffic Volume (veh/h)	366	0	391	0	0	0	0	571	374	546	1052	0
Future Volume (veh/h)	366	0	391	0	0	0	0	571	374	546	1052	0
Number	7	4	14				5	2	12	1	6	16
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
Adj Sat Flow, veh/h/ln	1863	0	1863				0	1863	1900	1863	1863	0
Adj Flow Rate, veh/h	411	0	439				0	642	420	613	1182	0
Adj No. of Lanes	2	0	1				0	3	0	2	2	0
Peak Hour Factor	0.89	0.89	0.89				0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	0	2				0	2	2	2	2	0
Cap, veh/h	1082	0	464				0	969	452	787	2022	0
Arrive On Green	0.31	0.00	0.29				0.00	0.29	0.26	0.15	0.38	0.00
Sat Flow, veh/h	3442	0	1583				0	3558	1583	3442	3632	0
Grp Volume(v), veh/h	411	0	439				0	642	420	613	1182	0
Grp Sat Flow(s),veh/h/ln	1721	0	1583				0	1695	1583	1721	1770	0
Q Serve(g_s), s	6.5	0.0	19.0				0.0	11.7	18.1	12.0	18.6	0.0
Cycle Q Clear(g_c), s	6.5	0.0	19.0				0.0	11.7	18.1	12.0	18.6	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	1082	0	464				0	969	452	787	2022	0
V/C Ratio(X)	0.38	0.00	0.95				0.00	0.66	0.93	0.78	0.58	0.00
Avail Cap(c_a), veh/h	1082	0	464				0	969	452	787	2022	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	0.67	0.67	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	0.82	0.82	0.00
Uniform Delay (d), s/veh	18.7	0.0	24.2				0.0	22.0	25.1	27.9	15.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	28.8				0.0	3.6	27.7	4.2	1.0	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	3.1	0.0	12.0				0.0	5.9	11.3	6.1	9.4	0.0
LnGrp Delay(d),s/veh	18.9	0.0	53.0				0.0	25.6	52.8	32.1	16.0	0.0
LnGrp LOS	B		D					C	D	C	B	
Approach Vol, veh/h		850						1062			1795	
Approach Delay, s/veh		36.5						36.3			21.5	
Approach LOS		D						D			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	20.0	24.0		26.0		44.0						
Change Period (Y+Rc), s	5.5	5.5		5.5		5.5						
Max Green Setting (Gmax), s	14.5	18.5		20.5		38.5						
Max Q Clear Time (g_c+I1), s	14.0	20.1		21.0		20.6						
Green Ext Time (p_c), s	0.2	0.0		0.0		5.7						
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			29.2									
HCM 2010 LOS			C									

HCM 2010 Signalized Intersection Summary  
 3: Riverside Ave & Slove Ave/Slover Ave

02/02/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 			 			 	
Traffic Volume (veh/h)	272	44	54	19	12	44	52	695	8	21	1001	372
Future Volume (veh/h)	272	44	54	19	12	44	52	695	8	21	1001	372
Number	7	4	14	3	8	18	5	2	12	1	6	16
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	306	49	61	21	13	49	58	781	9	24	1125	418
Adj No. of Lanes	1	2	0	1	2	0	1	2	0	1	2	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	381	412	369	361	412	369	177	1771	20	66	1097	399
Arrive On Green	0.23	0.23	0.23	0.23	0.23	0.23	0.10	0.49	0.49	0.04	0.43	0.43
Sat Flow, veh/h	1335	1770	1583	1278	1770	1583	1774	3584	41	1774	2544	925
Grp Volume(v), veh/h	306	49	61	21	13	49	58	386	404	24	775	768
Grp Sat Flow(s),veh/h/ln	1335	1770	1583	1278	1770	1583	1774	1770	1855	1774	1770	1699
Q Serve(g_s), s	14.6	1.5	2.2	0.9	0.4	1.7	2.1	9.9	9.9	0.9	30.2	30.2
Cycle Q Clear(g_c), s	16.3	1.5	2.2	3.1	0.4	1.7	2.1	9.9	9.9	0.9	30.2	30.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.02	1.00		0.54
Lane Grp Cap(c), veh/h	381	412	369	361	412	369	177	874	917	66	763	733
V/C Ratio(X)	0.80	0.12	0.17	0.06	0.03	0.13	0.33	0.44	0.44	0.36	1.02	1.05
Avail Cap(c_a), veh/h	381	412	369	361	412	369	177	874	917	177	763	733
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	28.4	21.2	21.4	22.7	20.8	21.3	29.3	11.5	11.5	32.9	19.9	19.9
Incr Delay (d2), s/veh	11.8	0.1	0.2	0.1	0.0	0.2	1.1	1.6	1.5	3.3	36.5	46.2
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	7.1	0.8	1.0	0.3	0.2	0.8	1.1	5.2	5.4	0.5	22.4	23.5
LnGrp Delay(d),s/veh	40.1	21.3	21.6	22.7	20.8	21.4	30.4	13.1	13.0	36.2	56.4	66.1
LnGrp LOS	D	C	C	C	C	C	C	B	B	D	F	F
Approach Vol, veh/h		416			83			848			1567	
Approach Delay, s/veh		35.2			21.6			14.2			60.8	
Approach LOS		D			C			B			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.1	40.1		21.8	12.5	35.7		21.8				
Change Period (Y+Rc), s	5.5	5.5		5.5	5.5	5.5		5.5				
Max Green Setting (Gmax), s	7.0	30.2		16.3	7.0	30.2		16.3				
Max Q Clear Time (g_c+I1), s	2.9	11.9		18.3	4.1	32.2		5.1				
Green Ext Time (p_c), s	0.0	4.8		0.0	0.0	0.0		0.2				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay				42.5								
HCM 2010 LOS				D								

# HCM 2010 Signalized Intersection Summary

## 1: Riverside Ave & I-10 WB Ramps

02/02/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	404	0	420	256	796	0	0	1197	658
Future Volume (veh/h)	0	0	0	404	0	420	256	796	0	0	1197	658
Number				3	8	18	5	2	12	1	6	16
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
Adj Sat Flow, veh/h/ln				1863	0	1863	1863	1863	0	0	1863	1863
Adj Flow Rate, veh/h				454	0	472	288	894	0	0	1345	739
Adj No. of Lanes				2	0	1	2	2	0	0	4	1
Peak Hour Factor				0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %				2	0	2	2	2	0	0	2	2
Cap, veh/h				1037	0	477	370	1916	0	0	2276	562
Arrive On Green				0.30	0.00	0.30	0.22	1.00	0.00	0.00	0.36	0.36
Sat Flow, veh/h				3442	0	1583	3442	3632	0	0	6669	1583
Grp Volume(v), veh/h				454	0	472	288	894	0	0	1345	739
Grp Sat Flow(s),veh/h/ln				1721	0	1583	1721	1770	0	0	1602	1583
Q Serve(g_s), s				7.4	0.0	20.8	5.5	0.0	0.0	0.0	12.0	24.9
Cycle Q Clear(g_c), s				7.4	0.0	20.8	5.5	0.0	0.0	0.0	12.0	24.9
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				1037	0	477	370	1916	0	0	2276	562
V/C Ratio(X)				0.44	0.00	0.99	0.78	0.47	0.00	0.00	0.59	1.31
Avail Cap(c_a), veh/h				1037	0	477	388	1916	0	0	2276	562
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.78	0.78	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				19.7	0.0	24.3	26.7	0.0	0.0	0.0	18.4	22.6
Incr Delay (d2), s/veh				0.3	0.0	38.2	7.3	0.6	0.0	0.0	1.1	153.6
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				3.6	0.0	14.1	2.9	0.2	0.0	0.0	5.4	34.8
LnGrp Delay(d),s/veh				20.0	0.0	62.5	34.0	0.6	0.0	0.0	19.6	176.2
LnGrp LOS				B		E	C	A			B	F
Approach Vol, veh/h					926			1182			2084	
Approach Delay, s/veh					41.7			8.8			75.1	
Approach LOS					D			A			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		43.4			13.0	30.4		26.6				
Change Period (Y+Rc), s		5.5			5.5	5.5		5.5				
Max Green Setting (Gmax), s		37.9			7.9	24.5		21.1				
Max Q Clear Time (g_c+I1), s		2.0			7.5	26.9		22.8				
Green Ext Time (p_c), s		6.9			0.0	0.0		0.0				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay				49.0								
HCM 2010 LOS				D								

# HCM 2010 Signalized Intersection Summary

## 2: Riverside Ave & I-10 EB Ramps

02/02/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 							  		 	 	
Traffic Volume (veh/h)	366	0	394	0	0	0	0	591	384	546	1055	0
Future Volume (veh/h)	366	0	394	0	0	0	0	591	384	546	1055	0
Number	7	4	14				5	2	12	1	6	16
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
Adj Sat Flow, veh/h/ln	1863	0	1863				0	1863	1900	1863	1863	0
Adj Flow Rate, veh/h	411	0	443				0	664	431	613	1185	0
Adj No. of Lanes	2	0	1				0	3	0	2	2	0
Peak Hour Factor	0.89	0.89	0.89				0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	0	2				0	2	2	2	2	0
Cap, veh/h	1082	0	464				0	969	452	787	2022	0
Arrive On Green	0.31	0.00	0.29				0.00	0.29	0.26	0.15	0.38	0.00
Sat Flow, veh/h	3442	0	1583				0	3558	1583	3442	3632	0
Grp Volume(v), veh/h	411	0	443				0	664	431	613	1185	0
Grp Sat Flow(s),veh/h/ln	1721	0	1583				0	1695	1583	1721	1770	0
Q Serve(g_s), s	6.5	0.0	19.2				0.0	12.2	18.7	12.0	18.6	0.0
Cycle Q Clear(g_c), s	6.5	0.0	19.2				0.0	12.2	18.7	12.0	18.6	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	1082	0	464				0	969	452	787	2022	0
V/C Ratio(X)	0.38	0.00	0.96				0.00	0.69	0.95	0.78	0.59	0.00
Avail Cap(c_a), veh/h	1082	0	464				0	969	452	787	2022	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	0.67	0.67	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	0.82	0.82	0.00
Uniform Delay (d), s/veh	18.7	0.0	24.3				0.0	22.2	25.3	27.9	15.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	30.6				0.0	3.9	32.0	4.2	1.0	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	3.1	0.0	12.3				0.0	6.2	12.2	6.1	9.4	0.0
LnGrp Delay(d),s/veh	18.9	0.0	54.9				0.0	26.1	57.3	32.1	16.0	0.0
LnGrp LOS	B		D					C	E	C	B	
Approach Vol, veh/h		854						1095			1798	
Approach Delay, s/veh		37.6						38.4			21.5	
Approach LOS		D						D			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	20.0	24.0		26.0		44.0						
Change Period (Y+Rc), s	5.5	5.5		5.5		5.5						
Max Green Setting (Gmax), s	14.5	18.5		20.5		38.5						
Max Q Clear Time (g_c+I1), s	14.0	20.7		21.2		20.6						
Green Ext Time (p_c), s	0.2	0.0		0.0		5.7						
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			30.1									
HCM 2010 LOS			C									

# HCM 2010 Signalized Intersection Summary

## 3: Riverside Ave & Slove Ave/Slover Ave

02/02/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	272	44	54	23	12	74	52	695	9	28	1001	372
Future Volume (veh/h)	272	44	54	23	12	74	52	695	9	28	1001	372
Number	7	4	14	3	8	18	5	2	12	1	6	16
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	306	49	61	26	13	83	58	781	10	31	1125	418
Adj No. of Lanes	1	2	0	1	2	0	1	2	0	1	2	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	349	412	369	361	412	369	177	1740	22	80	1097	399
Arrive On Green	0.23	0.23	0.23	0.23	0.23	0.23	0.10	0.49	0.49	0.05	0.43	0.43
Sat Flow, veh/h	1294	1770	1583	1278	1770	1583	1774	3578	46	1774	2544	925
Grp Volume(v), veh/h	306	49	61	26	13	83	58	386	405	31	775	768
Grp Sat Flow(s),veh/h/ln	1294	1770	1583	1278	1770	1583	1774	1770	1855	1774	1770	1699
Q Serve(g_s), s	13.3	1.5	2.2	1.2	0.4	3.0	2.1	10.0	10.0	1.2	30.2	30.2
Cycle Q Clear(g_c), s	16.3	1.5	2.2	3.3	0.4	3.0	2.1	10.0	10.0	1.2	30.2	30.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.02	1.00		0.54
Lane Grp Cap(c), veh/h	349	412	369	361	412	369	177	860	902	80	763	733
V/C Ratio(X)	0.88	0.12	0.17	0.07	0.03	0.23	0.33	0.45	0.45	0.39	1.02	1.05
Avail Cap(c_a), veh/h	349	412	369	361	412	369	177	860	902	177	763	733
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	29.6	21.2	21.4	22.7	20.8	21.7	29.3	11.8	11.8	32.5	19.9	19.9
Incr Delay (d2), s/veh	21.2	0.1	0.2	0.1	0.0	0.3	1.1	1.7	1.6	3.0	36.5	46.2
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	0.8	1.0	0.4	0.2	1.3	1.1	5.2	5.5	0.7	22.4	23.5
LnGrp Delay(d),s/veh	50.9	21.3	21.6	22.8	20.8	22.0	30.4	13.5	13.4	35.5	56.4	66.1
LnGrp LOS	D	C	C	C	C	C	C	B	B	D	F	F
Approach Vol, veh/h		416			122			849			1574	
Approach Delay, s/veh		43.1			22.1			14.6			60.7	
Approach LOS		D			C			B			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.7	39.5		21.8	12.5	35.7		21.8				
Change Period (Y+Rc), s	5.5	5.5		5.5	5.5	5.5		5.5				
Max Green Setting (Gmax), s	7.0	30.2		16.3	7.0	30.2		16.3				
Max Q Clear Time (g_c+I1), s	3.2	12.0		18.3	4.1	32.2		5.3				
Green Ext Time (p_c), s	0.0	4.8		0.0	0.0	0.0		0.4				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay				43.4								
HCM 2010 LOS				D								

# HCM 2010 Signalized Intersection Summary

## 1: Riverside Ave & I-10 WB Ramps

02/02/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	404	0	436	280	810	0	0	1213	658
Future Volume (veh/h)	0	0	0	404	0	436	280	810	0	0	1213	658
Number				3	8	18	5	2	12	1	6	16
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
Adj Sat Flow, veh/h/ln				1863	0	1863	1863	1863	0	0	1863	1863
Adj Flow Rate, veh/h				454	0	490	315	910	0	0	1363	739
Adj No. of Lanes				2	0	1	2	2	0	0	4	1
Peak Hour Factor				0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %				2	0	2	2	2	0	0	2	2
Cap, veh/h				1037	0	477	388	1916	0	0	2243	554
Arrive On Green				0.30	0.00	0.30	0.23	1.00	0.00	0.00	0.35	0.35
Sat Flow, veh/h				3442	0	1583	3442	3632	0	0	6669	1583
Grp Volume(v), veh/h				454	0	490	315	910	0	0	1363	739
Grp Sat Flow(s),veh/h/ln				1721	0	1583	1721	1770	0	0	1602	1583
Q Serve(g_s), s				7.4	0.0	21.1	6.1	0.0	0.0	0.0	12.3	24.5
Cycle Q Clear(g_c), s				7.4	0.0	21.1	6.1	0.0	0.0	0.0	12.3	24.5
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				1037	0	477	388	1916	0	0	2243	554
V/C Ratio(X)				0.44	0.00	1.03	0.81	0.47	0.00	0.00	0.61	1.33
Avail Cap(c_a), veh/h				1037	0	477	388	1916	0	0	2243	554
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.74	0.74	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				19.7	0.0	24.5	26.4	0.0	0.0	0.0	18.8	22.7
Incr Delay (d2), s/veh				0.3	0.0	48.2	9.3	0.6	0.0	0.0	1.2	162.1
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				3.6	0.0	15.5	3.3	0.2	0.0	0.0	5.6	35.6
LnGrp Delay(d),s/veh				20.0	0.0	72.6	35.7	0.6	0.0	0.0	20.0	184.9
LnGrp LOS				B		F	D	A			C	F
Approach Vol, veh/h					944			1225			2102	
Approach Delay, s/veh					47.3			9.6			78.0	
Approach LOS					D			A			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		43.4			13.4	30.0		26.6				
Change Period (Y+Rc), s		5.5			5.5	5.5		5.5				
Max Green Setting (Gmax), s		37.9			7.9	24.5		21.1				
Max Q Clear Time (g_c+I1), s		2.0			8.1	26.5		23.1				
Green Ext Time (p_c), s		7.1			0.0	0.0		0.0				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay				51.6								
HCM 2010 LOS				D								

# HCM 2010 Signalized Intersection Summary

## 2: Riverside Ave & I-10 EB Ramps

02/02/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	366	0	410	0	0	0	0	629	407	546	1087	0
Future Volume (veh/h)	366	0	410	0	0	0	0	629	407	546	1087	0
Number	7	4	14				5	2	12	1	6	16
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
Adj Sat Flow, veh/h/ln	1863	0	1863				0	1863	1900	1863	1863	0
Adj Flow Rate, veh/h	411	0	461				0	707	457	613	1221	0
Adj No. of Lanes	2	0	1				0	3	0	2	2	0
Peak Hour Factor	0.89	0.89	0.89				0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	0	2				0	2	2	2	2	0
Cap, veh/h	1082	0	464				0	969	452	787	2022	0
Arrive On Green	0.31	0.00	0.29				0.00	0.29	0.26	0.15	0.38	0.00
Sat Flow, veh/h	3442	0	1583				0	3558	1583	3442	3632	0
Grp Volume(v), veh/h	411	0	461				0	707	457	613	1221	0
Grp Sat Flow(s),veh/h/ln	1721	0	1583				0	1695	1583	1721	1770	0
Q Serve(g_s), s	6.5	0.0	20.3				0.0	13.2	20.0	12.0	19.4	0.0
Cycle Q Clear(g_c), s	6.5	0.0	20.3				0.0	13.2	20.0	12.0	19.4	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	1082	0	464				0	969	452	787	2022	0
V/C Ratio(X)	0.38	0.00	0.99				0.00	0.73	1.01	0.78	0.60	0.00
Avail Cap(c_a), veh/h	1082	0	464				0	969	452	787	2022	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	0.67	0.67	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	0.81	0.81	0.00
Uniform Delay (d), s/veh	18.7	0.0	24.7				0.0	22.6	25.8	27.9	15.2	0.0
Incr Delay (d2), s/veh	0.2	0.0	40.2				0.0	4.8	44.9	4.1	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	3.1	0.0	14.0				0.0	6.7	14.3	6.1	9.8	0.0
LnGrp Delay(d),s/veh	18.9	0.0	64.9				0.0	27.4	70.7	32.1	16.3	0.0
LnGrp LOS	B		E					C	F	C	B	
Approach Vol, veh/h		872						1164			1834	
Approach Delay, s/veh		43.2						44.4			21.6	
Approach LOS		D						D			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	20.0	24.0		26.0		44.0						
Change Period (Y+Rc), s	5.5	5.5		5.5		5.5						
Max Green Setting (Gmax), s	14.5	18.5		20.5		38.5						
Max Q Clear Time (g_c+I1), s	14.0	22.0		22.3		21.4						
Green Ext Time (p_c), s	0.2	0.0		0.0		5.8						
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			33.3									
HCM 2010 LOS			C									

HCM 2010 Signalized Intersection Summary  
 3: Riverside Ave & Slove Ave/Slover Ave

02/02/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 			 			 	
Traffic Volume (veh/h)	319	44	54	23	12	74	52	709	9	28	1016	405
Future Volume (veh/h)	319	44	54	23	12	74	52	709	9	28	1016	405
Number	7	4	14	3	8	18	5	2	12	1	6	16
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	358	49	61	26	13	83	58	797	10	31	1142	455
Adj No. of Lanes	1	2	0	1	2	0	1	2	0	1	2	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	349	412	369	361	412	369	177	1740	22	80	1076	417
Arrive On Green	0.23	0.23	0.23	0.23	0.23	0.23	0.10	0.49	0.49	0.05	0.43	0.43
Sat Flow, veh/h	1294	1770	1583	1278	1770	1583	1774	3580	45	1774	2494	967
Grp Volume(v), veh/h	358	49	61	26	13	83	58	394	413	31	801	796
Grp Sat Flow(s),veh/h/ln	1294	1770	1583	1278	1770	1583	1774	1770	1855	1774	1770	1692
Q Serve(g_s), s	13.3	1.5	2.2	1.2	0.4	3.0	2.1	10.3	10.3	1.2	30.2	30.2
Cycle Q Clear(g_c), s	16.3	1.5	2.2	3.3	0.4	3.0	2.1	10.3	10.3	1.2	30.2	30.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.02	1.00		0.57
Lane Grp Cap(c), veh/h	349	412	369	361	412	369	177	860	902	80	763	730
V/C Ratio(X)	1.02	0.12	0.17	0.07	0.03	0.23	0.33	0.46	0.46	0.39	1.05	1.09
Avail Cap(c_a), veh/h	349	412	369	361	412	369	177	860	902	177	763	730
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	30.3	21.2	21.4	22.7	20.8	21.7	29.3	11.9	11.9	32.5	19.9	19.9
Incr Delay (d2), s/veh	54.7	0.1	0.2	0.1	0.0	0.3	1.1	1.8	1.7	3.0	46.2	60.6
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	12.0	0.8	1.0	0.4	0.2	1.3	1.1	5.5	5.7	0.7	24.4	26.3
LnGrp Delay(d),s/veh	85.0	21.3	21.6	22.8	20.8	22.0	30.4	13.6	13.6	35.5	66.1	80.5
LnGrp LOS	F	C	C	C	C	C	C	B	B	D	F	F
Approach Vol, veh/h		468			122			865			1628	
Approach Delay, s/veh		70.0			22.1			14.7			72.6	
Approach LOS		E			C			B			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.7	39.5		21.8	12.5	35.7		21.8				
Change Period (Y+Rc), s	5.5	5.5		5.5	5.5	5.5		5.5				
Max Green Setting (Gmax), s	7.0	30.2		16.3	7.0	30.2		16.3				
Max Q Clear Time (g_c+I1), s	3.2	12.3		18.3	4.1	32.2		5.3				
Green Ext Time (p_c), s	0.0	4.9		0.0	0.0	0.0		0.4				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay				54.0								
HCM 2010 LOS				D								

# HCM 2010 Signalized Intersection Summary

## 1: Riverside Ave & I-10 WB Ramps

02/02/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	335	0	543	279	1676	0	0	948	384
Future Volume (veh/h)	0	0	0	335	0	543	279	1676	0	0	948	384
Number				3	8	18	5	2	12	1	6	16
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
Adj Sat Flow, veh/h/ln				1863	0	1863	1863	1863	0	0	1863	1863
Adj Flow Rate, veh/h				376	0	610	313	1883	0	0	1065	431
Adj No. of Lanes				2	0	1	2	2	0	0	4	1
Peak Hour Factor				0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %				2	0	2	2	2	0	0	2	2
Cap, veh/h				1119	0	515	388	1902	0	0	2281	564
Arrive On Green				0.32	0.00	0.32	0.23	1.00	0.00	0.00	0.36	0.36
Sat Flow, veh/h				3442	0	1583	3442	3632	0	0	6669	1583
Grp Volume(v), veh/h				376	0	610	313	1883	0	0	1065	431
Grp Sat Flow(s),veh/h/ln				1721	0	1583	1721	1770	0	0	1602	1583
Q Serve(g_s), s				6.6	0.0	26.0	6.9	0.0	0.0	0.0	10.3	19.3
Cycle Q Clear(g_c), s				6.6	0.0	26.0	6.9	0.0	0.0	0.0	10.3	19.3
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				1119	0	515	388	1902	0	0	2281	564
V/C Ratio(X)				0.34	0.00	1.19	0.81	0.99	0.00	0.00	0.47	0.76
Avail Cap(c_a), veh/h				1119	0	515	435	1902	0	0	2281	564
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.31	0.31	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				20.5	0.0	27.0	30.1	0.0	0.0	0.0	19.9	22.8
Incr Delay (d2), s/veh				0.2	0.0	101.8	3.2	9.3	0.0	0.0	0.7	9.5
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				3.2	0.0	25.8	3.4	2.5	0.0	0.0	4.6	9.9
LnGrp Delay(d),s/veh				20.6	0.0	128.8	33.3	9.3	0.0	0.0	20.6	32.3
LnGrp LOS				C		F	C	A			C	C
Approach Vol, veh/h					986			2196			1496	
Approach Delay, s/veh					87.5			12.7			24.0	
Approach LOS					F			B			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		48.5			14.5	34.0		31.5				
Change Period (Y+Rc), s		5.5			5.5	5.5		5.5				
Max Green Setting (Gmax), s		43.0			10.1	27.4		26.0				
Max Q Clear Time (g_c+I1), s		2.0			8.9	21.3		28.0				
Green Ext Time (p_c), s		22.2			0.1	4.0		0.0				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay				32.1								
HCM 2010 LOS				C								

HCM 2010 Signalized Intersection Summary  
 2: Riverside Ave & I-10 EB Ramps

02/02/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 							  		 	 	
Traffic Volume (veh/h)	692	0	244	0	0	0	0	1248	522	444	874	0
Future Volume (veh/h)	692	0	244	0	0	0	0	1248	522	444	874	0
Number	7	4	14				5	2	12	1	6	16
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
Adj Sat Flow, veh/h/ln	1863	0	1863				0	1863	1900	1863	1863	0
Adj Flow Rate, veh/h	778	0	274				0	1402	587	499	982	0
Adj No. of Lanes	2	0	1				0	3	0	2	2	0
Peak Hour Factor	0.89	0.89	0.89				0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	0	2				0	2	2	2	2	0
Cap, veh/h	860	0	366				0	1535	632	572	2300	0
Arrive On Green	0.25	0.00	0.23				0.00	0.43	0.42	0.33	1.00	0.00
Sat Flow, veh/h	3442	0	1583				0	3707	1456	3442	3632	0
Grp Volume(v), veh/h	778	0	274				0	1342	647	499	982	0
Grp Sat Flow(s),veh/h/ln	1721	0	1583				0	1695	1606	1721	1770	0
Q Serve(g_s), s	17.5	0.0	12.9				0.0	29.7	30.7	10.9	0.0	0.0
Cycle Q Clear(g_c), s	17.5	0.0	12.9				0.0	29.7	30.7	10.9	0.0	0.0
Prop In Lane	1.00		1.00				0.00		0.91	1.00		0.00
Lane Grp Cap(c), veh/h	860	0	366				0	1470	696	572	2300	0
V/C Ratio(X)	0.90	0.00	0.75				0.00	0.91	0.93	0.87	0.43	0.00
Avail Cap(c_a), veh/h	860	0	366				0	1470	696	572	2300	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	0.90	0.90	0.00
Uniform Delay (d), s/veh	29.1	0.0	28.6				0.0	21.2	22.2	25.9	0.0	0.0
Incr Delay (d2), s/veh	12.9	0.0	8.2				0.0	10.1	20.6	12.6	0.5	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	9.9	0.0	6.5				0.0	15.9	17.5	6.1	0.2	0.0
LnGrp Delay(d),s/veh	42.0	0.0	36.8				0.0	31.4	42.8	38.5	0.5	0.0
LnGrp LOS	D		D					C	D	D	A	
Approach Vol, veh/h		1052						1989			1481	
Approach Delay, s/veh		40.6						35.1			13.3	
Approach LOS		D						D			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	17.3	38.7		24.0		56.0						
Change Period (Y+Rc), s	5.5	5.5		5.5		5.5						
Max Green Setting (Gmax), s	11.8	33.2		18.5		50.5						
Max Q Clear Time (g_c+I1), s	12.9	32.7		19.5		2.0						
Green Ext Time (p_c), s	0.0	0.4		0.0		5.3						
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			29.2									
HCM 2010 LOS			C									

HCM 2010 Signalized Intersection Summary  
 3: Riverside Ave & Slove Ave/Slover Ave

02/02/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	461	223	93	25	9	156	25	1058	12	26	820	234
Future Volume (veh/h)	461	223	93	25	9	156	25	1058	12	26	820	234
Number	7	4	14	3	8	18	5	2	12	1	6	16
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	518	251	104	28	10	175	28	1189	13	29	921	263
Adj No. of Lanes	1	2	0	1	2	0	1	2	0	1	2	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	453	939	379	406	675	604	72	1166	13	155	1012	288
Arrive On Green	0.38	0.38	0.38	0.38	0.38	0.38	0.04	0.32	0.32	0.09	0.37	0.37
Sat Flow, veh/h	1194	2464	993	1022	1770	1583	1774	3586	39	1774	2720	775
Grp Volume(v), veh/h	518	178	177	28	10	175	28	587	615	29	598	586
Grp Sat Flow(s),veh/h/ln	1194	1770	1687	1022	1770	1583	1774	1770	1856	1774	1770	1726
Q Serve(g_s), s	24.3	5.5	5.8	1.6	0.3	6.2	1.2	26.0	26.0	1.2	25.7	25.8
Cycle Q Clear(g_c), s	30.5	5.5	5.8	7.3	0.3	6.2	1.2	26.0	26.0	1.2	25.7	25.8
Prop In Lane	1.00		0.59	1.00		1.00	1.00		0.02	1.00		0.45
Lane Grp Cap(c), veh/h	453	675	643	406	675	604	72	575	603	155	658	642
V/C Ratio(X)	1.14	0.26	0.27	0.07	0.01	0.29	0.39	1.02	1.02	0.19	0.91	0.91
Avail Cap(c_a), veh/h	453	675	643	406	675	604	155	575	603	155	658	642
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	30.2	17.0	17.1	19.6	15.4	17.2	37.4	27.0	27.0	33.9	23.8	23.9
Incr Delay (d2), s/veh	87.5	0.2	0.2	0.1	0.0	0.3	3.4	42.7	41.9	0.6	18.7	19.5
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	21.0	2.7	2.7	0.4	0.1	2.7	0.7	19.4	20.2	0.6	15.9	15.7
LnGrp Delay(d),s/veh	117.7	17.2	17.3	19.7	15.4	17.5	40.8	69.7	68.9	34.4	42.6	43.4
LnGrp LOS	F	B	B	B	B	B	D	F	F	C	D	D
Approach Vol, veh/h		873			213			1230			1213	
Approach Delay, s/veh		76.9			17.7			68.6			42.8	
Approach LOS		E			B			E			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	12.5	31.5		36.0	8.7	35.3		36.0				
Change Period (Y+Rc), s	5.5	5.5		5.5	5.5	5.5		5.5				
Max Green Setting (Gmax), s	7.0	26.0		30.5	7.0	26.0		30.5				
Max Q Clear Time (g_c+I1), s	3.2	28.0		32.5	3.2	27.8		9.3				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	0.0		1.2				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			58.7									
HCM 2010 LOS			E									

# HCM 2010 Signalized Intersection Summary

## 1: Riverside Ave & I-10 WB Ramps

02/02/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	342	0	554	285	1710	0	0	967	392
Future Volume (veh/h)	0	0	0	342	0	554	285	1710	0	0	967	392
Number				3	8	18	5	2	12	1	6	16
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
Adj Sat Flow, veh/h/ln				1863	0	1863	1863	1863	0	0	1863	1863
Adj Flow Rate, veh/h				384	0	622	320	1921	0	0	1087	440
Adj No. of Lanes				2	0	1	2	2	0	0	4	1
Peak Hour Factor				0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %				2	0	2	2	2	0	0	2	2
Cap, veh/h				1119	0	515	394	1902	0	0	2269	561
Arrive On Green				0.32	0.00	0.32	0.23	1.00	0.00	0.00	0.35	0.35
Sat Flow, veh/h				3442	0	1583	3442	3632	0	0	6669	1583
Grp Volume(v), veh/h				384	0	622	320	1921	0	0	1087	440
Grp Sat Flow(s),veh/h/ln				1721	0	1583	1721	1770	0	0	1602	1583
Q Serve(g_s), s				6.8	0.0	26.0	7.0	43.0	0.0	0.0	10.6	19.9
Cycle Q Clear(g_c), s				6.8	0.0	26.0	7.0	43.0	0.0	0.0	10.6	19.9
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				1119	0	515	394	1902	0	0	2269	561
V/C Ratio(X)				0.34	0.00	1.21	0.81	1.01	0.00	0.00	0.48	0.78
Avail Cap(c_a), veh/h				1119	0	515	435	1902	0	0	2269	561
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.27	0.27	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				20.5	0.0	27.0	30.0	0.0	0.0	0.0	20.1	23.1
Incr Delay (d2), s/veh				0.2	0.0	111.1	3.0	13.2	0.0	0.0	0.7	10.5
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				3.2	0.0	27.2	3.4	3.5	0.0	0.0	4.8	10.3
LnGrp Delay(d),s/veh				20.7	0.0	138.1	33.0	13.2	0.0	0.0	20.8	33.7
LnGrp LOS				C		F	C	F			C	C
Approach Vol, veh/h					1006			2241			1527	
Approach Delay, s/veh					93.3			16.0			24.5	
Approach LOS					F			B			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		48.5			14.7	33.8		31.5				
Change Period (Y+Rc), s		5.5			5.5	5.5		5.5				
Max Green Setting (Gmax), s		43.0			10.1	27.4		26.0				
Max Q Clear Time (g_c+I1), s		45.0			9.0	21.9		28.0				
Green Ext Time (p_c), s		0.0			0.1	3.7		0.0				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay				35.0								
HCM 2010 LOS				D								

# HCM 2010 Signalized Intersection Summary

## 2: Riverside Ave & I-10 EB Ramps

02/02/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	706	0	249	0	0	0	0	1273	532	453	892	0
Future Volume (veh/h)	706	0	249	0	0	0	0	1273	532	453	892	0
Number	7	4	14				5	2	12	1	6	16
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
Adj Sat Flow, veh/h/ln	1863	0	1863				0	1863	1900	1863	1863	0
Adj Flow Rate, veh/h	793	0	280				0	1430	598	509	1002	0
Adj No. of Lanes	2	0	1				0	3	0	2	2	0
Peak Hour Factor	0.89	0.89	0.89				0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	0	2				0	2	2	2	2	0
Cap, veh/h	860	0	366				0	1537	630	572	2300	0
Arrive On Green	0.25	0.00	0.23				0.00	0.43	0.42	0.33	1.00	0.00
Sat Flow, veh/h	3442	0	1583				0	3712	1452	3442	3632	0
Grp Volume(v), veh/h	793	0	280				0	1367	661	509	1002	0
Grp Sat Flow(s),veh/h/ln	1721	0	1583				0	1695	1606	1721	1770	0
Q Serve(g_s), s	18.0	0.0	13.2				0.0	30.6	31.8	11.2	0.0	0.0
Cycle Q Clear(g_c), s	18.0	0.0	13.2				0.0	30.6	31.8	11.2	0.0	0.0
Prop In Lane	1.00		1.00				0.00		0.90	1.00		0.00
Lane Grp Cap(c), veh/h	860	0	366				0	1470	697	572	2300	0
V/C Ratio(X)	0.92	0.00	0.76				0.00	0.93	0.95	0.89	0.44	0.00
Avail Cap(c_a), veh/h	860	0	366				0	1470	697	572	2300	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	0.89	0.89	0.00
Uniform Delay (d), s/veh	29.2	0.0	28.7				0.0	21.5	22.5	26.0	0.0	0.0
Incr Delay (d2), s/veh	15.1	0.0	9.3				0.0	11.8	23.7	14.5	0.5	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	10.3	0.0	6.7				0.0	16.6	18.6	6.4	0.2	0.0
LnGrp Delay(d),s/veh	44.3	0.0	38.0				0.0	33.2	46.2	40.5	0.5	0.0
LnGrp LOS	D		D					C	D	D	A	
Approach Vol, veh/h		1073						2028			1511	
Approach Delay, s/veh		42.7						37.5			14.0	
Approach LOS		D						D			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	17.3	38.7		24.0		56.0						
Change Period (Y+Rc), s	5.5	5.5		5.5		5.5						
Max Green Setting (Gmax), s	11.8	33.2		18.5		50.5						
Max Q Clear Time (g_c+I1), s	13.2	33.8		20.0		2.0						
Green Ext Time (p_c), s	0.0	0.0		0.0		5.5						
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			31.0									
HCM 2010 LOS			C									

# HCM 2010 Signalized Intersection Summary

## 3: Riverside Ave & Slove Ave/Slover Ave

02/02/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 			 			 	
Traffic Volume (veh/h)	470	227	95	26	9	159	26	1079	12	27	836	239
Future Volume (veh/h)	470	227	95	26	9	159	26	1079	12	27	836	239
Number	7	4	14	3	8	18	5	2	12	1	6	16
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	528	255	107	29	10	179	29	1212	13	30	939	269
Adj No. of Lanes	1	2	0	1	2	0	1	2	0	1	2	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	450	935	382	402	675	604	74	1166	13	155	1008	288
Arrive On Green	0.38	0.38	0.38	0.38	0.38	0.38	0.04	0.32	0.32	0.09	0.37	0.37
Sat Flow, veh/h	1189	2454	1002	1016	1770	1583	1774	3587	38	1774	2719	777
Grp Volume(v), veh/h	528	182	180	29	10	179	29	598	627	30	610	598
Grp Sat Flow(s),veh/h/ln	1189	1770	1686	1016	1770	1583	1774	1770	1856	1774	1770	1726
Q Serve(g_s), s	24.2	5.7	5.9	1.6	0.3	6.3	1.3	26.0	26.0	1.3	26.5	26.7
Cycle Q Clear(g_c), s	30.5	5.7	5.9	7.5	0.3	6.3	1.3	26.0	26.0	1.3	26.5	26.7
Prop In Lane	1.00		0.59	1.00		1.00	1.00		0.02	1.00		0.45
Lane Grp Cap(c), veh/h	450	675	643	402	675	604	74	575	603	155	656	640
V/C Ratio(X)	1.17	0.27	0.28	0.07	0.01	0.30	0.39	1.04	1.04	0.19	0.93	0.93
Avail Cap(c_a), veh/h	450	675	643	402	675	604	155	575	603	155	656	640
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	30.3	17.1	17.1	19.8	15.4	17.3	37.4	27.0	27.0	33.9	24.2	24.2
Incr Delay (d2), s/veh	99.6	0.2	0.2	0.1	0.0	0.3	3.4	48.2	47.4	0.6	21.6	22.6
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	22.3	2.8	2.8	0.5	0.1	2.8	0.7	20.3	21.2	0.6	16.8	16.6
LnGrp Delay(d),s/veh	129.9	17.3	17.4	19.8	15.4	17.5	40.7	75.2	74.4	34.5	45.7	46.8
LnGrp LOS	F	B	B	B	B	B	D	F	F	C	D	D
Approach Vol, veh/h		890			218			1254			1238	
Approach Delay, s/veh		84.1			17.7			74.0			46.0	
Approach LOS		F			B			E			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	12.5	31.5		36.0	8.8	35.2		36.0				
Change Period (Y+Rc), s	5.5	5.5		5.5	5.5	5.5		5.5				
Max Green Setting (Gmax), s	7.0	26.0		30.5	7.0	26.0		30.5				
Max Q Clear Time (g_c+I1), s	3.3	28.0		32.5	3.3	28.7		9.5				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	0.0		1.2				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay	63.4											
HCM 2010 LOS	E											

# HCM 2010 Signalized Intersection Summary

## 1: Riverside Ave & I-10 WB Ramps

02/02/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	352	0	554	288	1710	0	0	970	392
Future Volume (veh/h)	0	0	0	352	0	554	288	1710	0	0	970	392
Number				3	8	18	5	2	12	1	6	16
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
Adj Sat Flow, veh/h/ln				1863	0	1863	1863	1863	0	0	1863	1863
Adj Flow Rate, veh/h				396	0	622	324	1921	0	0	1090	440
Adj No. of Lanes				2	0	1	2	2	0	0	4	1
Peak Hour Factor				0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %				2	0	2	2	2	0	0	2	2
Cap, veh/h				1119	0	515	398	1902	0	0	2263	559
Arrive On Green				0.32	0.00	0.32	0.23	1.00	0.00	0.00	0.35	0.35
Sat Flow, veh/h				3442	0	1583	3442	3632	0	0	6669	1583
Grp Volume(v), veh/h				396	0	622	324	1921	0	0	1090	440
Grp Sat Flow(s),veh/h/ln				1721	0	1583	1721	1770	0	0	1602	1583
Q Serve(g_s), s				7.0	0.0	26.0	7.1	43.0	0.0	0.0	10.6	19.9
Cycle Q Clear(g_c), s				7.0	0.0	26.0	7.1	43.0	0.0	0.0	10.6	19.9
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				1119	0	515	398	1902	0	0	2263	559
V/C Ratio(X)				0.35	0.00	1.21	0.81	1.01	0.00	0.00	0.48	0.79
Avail Cap(c_a), veh/h				1119	0	515	435	1902	0	0	2263	559
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.26	0.26	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				20.6	0.0	27.0	29.9	0.0	0.0	0.0	20.2	23.2
Incr Delay (d2), s/veh				0.2	0.0	111.1	3.0	13.1	0.0	0.0	0.7	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				3.3	0.0	27.2	3.5	3.5	0.0	0.0	4.8	10.3
LnGrp Delay(d),s/veh				20.8	0.0	138.1	33.0	13.1	0.0	0.0	20.9	33.9
LnGrp LOS				C		F	C	F			C	C
Approach Vol, veh/h					1018			2245			1530	
Approach Delay, s/veh					92.4			15.9			24.6	
Approach LOS					F			B			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		48.5			14.7	33.8		31.5				
Change Period (Y+Rc), s		5.5			5.5	5.5		5.5				
Max Green Setting (Gmax), s		43.0			10.1	27.4		26.0				
Max Q Clear Time (g_c+I1), s		45.0			9.1	21.9		28.0				
Green Ext Time (p_c), s		0.0			0.1	3.7		0.0				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay				35.0								
HCM 2010 LOS				C								

# HCM 2010 Signalized Intersection Summary

## 2: Riverside Ave & I-10 EB Ramps

02/02/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	706	0	265	0	0	0	0	1277	535	453	905	0
Future Volume (veh/h)	706	0	265	0	0	0	0	1277	535	453	905	0
Number	7	4	14				5	2	12	1	6	16
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
Adj Sat Flow, veh/h/ln	1863	0	1863				0	1863	1900	1863	1863	0
Adj Flow Rate, veh/h	793	0	298				0	1435	601	509	1017	0
Adj No. of Lanes	2	0	1				0	3	0	2	2	0
Peak Hour Factor	0.89	0.89	0.89				0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	0	2				0	2	2	2	2	0
Cap, veh/h	860	0	366				0	1537	630	572	2300	0
Arrive On Green	0.25	0.00	0.23				0.00	0.43	0.42	0.33	1.00	0.00
Sat Flow, veh/h	3442	0	1583				0	3711	1453	3442	3632	0
Grp Volume(v), veh/h	793	0	298				0	1372	664	509	1017	0
Grp Sat Flow(s),veh/h/ln	1721	0	1583				0	1695	1606	1721	1770	0
Q Serve(g_s), s	18.0	0.0	14.3				0.0	30.8	32.0	11.2	0.0	0.0
Cycle Q Clear(g_c), s	18.0	0.0	14.3				0.0	30.8	32.0	11.2	0.0	0.0
Prop In Lane	1.00		1.00				0.00		0.90	1.00		0.00
Lane Grp Cap(c), veh/h	860	0	366				0	1470	697	572	2300	0
V/C Ratio(X)	0.92	0.00	0.81				0.00	0.93	0.95	0.89	0.44	0.00
Avail Cap(c_a), veh/h	860	0	366				0	1470	697	572	2300	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(l)	1.00	0.00	1.00				0.00	1.00	1.00	0.89	0.89	0.00
Uniform Delay (d), s/veh	29.2	0.0	29.1				0.0	21.5	22.5	26.0	0.0	0.0
Incr Delay (d2), s/veh	15.1	0.0	13.2				0.0	12.1	24.4	14.4	0.5	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	10.3	0.0	7.5				0.0	16.8	18.8	6.4	0.2	0.0
LnGrp Delay(d),s/veh	44.3	0.0	42.3				0.0	33.7	47.0	40.4	0.5	0.0
LnGrp LOS	D		D					C	D	D	A	
Approach Vol, veh/h		1091						2036			1526	
Approach Delay, s/veh		43.8						38.0			13.9	
Approach LOS		D						D			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	17.3	38.7		24.0		56.0						
Change Period (Y+Rc), s	5.5	5.5		5.5		5.5						
Max Green Setting (Gmax), s	11.8	33.2		18.5		50.5						
Max Q Clear Time (g_c+I1), s	13.2	34.0		20.0		2.0						
Green Ext Time (p_c), s	0.0	0.0		0.0		5.6						
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			31.4									
HCM 2010 LOS			C									

# HCM 2010 Signalized Intersection Summary

## 3: Riverside Ave & Slove Ave/Slover Ave

02/02/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	470	227	95	26	9	165	26	1079	16	56	836	239
Future Volume (veh/h)	470	227	95	26	9	165	26	1079	16	56	836	239
Number	7	4	14	3	8	18	5	2	12	1	6	16
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	528	255	107	29	10	185	29	1212	18	63	939	269
Adj No. of Lanes	1	2	0	1	2	0	1	2	0	1	2	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	444	935	382	402	675	604	74	1160	17	155	1008	288
Arrive On Green	0.38	0.38	0.38	0.38	0.38	0.38	0.04	0.32	0.32	0.09	0.37	0.37
Sat Flow, veh/h	1183	2454	1002	1016	1770	1583	1774	3570	53	1774	2719	777
Grp Volume(v), veh/h	528	182	180	29	10	185	29	601	629	63	610	598
Grp Sat Flow(s),veh/h/ln	1183	1770	1686	1016	1770	1583	1774	1770	1853	1774	1770	1726
Q Serve(g_s), s	24.0	5.7	5.9	1.6	0.3	6.5	1.3	26.0	26.0	2.7	26.5	26.7
Cycle Q Clear(g_c), s	30.5	5.7	5.9	7.5	0.3	6.5	1.3	26.0	26.0	2.7	26.5	26.7
Prop In Lane	1.00		0.59	1.00		1.00	1.00		0.03	1.00		0.45
Lane Grp Cap(c), veh/h	444	675	643	402	675	604	74	575	602	155	656	640
V/C Ratio(X)	1.19	0.27	0.28	0.07	0.01	0.31	0.39	1.04	1.04	0.41	0.93	0.93
Avail Cap(c_a), veh/h	444	675	643	402	675	604	155	575	602	155	656	640
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	30.5	17.1	17.1	19.8	15.4	17.3	37.4	27.0	27.0	34.5	24.2	24.2
Incr Delay (d2), s/veh	105.5	0.2	0.2	0.1	0.0	0.3	3.4	49.6	48.9	1.7	21.6	22.6
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	22.8	2.8	2.8	0.5	0.1	2.9	0.7	20.5	21.4	1.4	16.8	16.6
LnGrp Delay(d),s/veh	135.9	17.3	17.4	19.8	15.4	17.6	40.7	76.6	75.9	36.2	45.7	46.8
LnGrp LOS	F	B	B	B	B	B	D	F	F	D	D	D
Approach Vol, veh/h		890			224			1259			1271	
Approach Delay, s/veh		87.7			17.8			75.4			45.8	
Approach LOS		F			B			E			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	12.5	31.5		36.0	8.8	35.2		36.0				
Change Period (Y+Rc), s	5.5	5.5		5.5	5.5	5.5		5.5				
Max Green Setting (Gmax), s	7.0	26.0		30.5	7.0	26.0		30.5				
Max Q Clear Time (g_c+I1), s	4.7	28.0		32.5	3.3	28.7		9.5				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	0.0		1.3				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			64.5									
HCM 2010 LOS			E									

# HCM 2010 Signalized Intersection Summary

## 1: Riverside Ave & I-10 WB Ramps

02/02/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	352	0	579	304	1728	0	0	988	392
Future Volume (veh/h)	0	0	0	352	0	579	304	1728	0	0	988	392
Number				3	8	18	5	2	12	1	6	16
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
Adj Sat Flow, veh/h/ln				1863	0	1863	1863	1863	0	0	1863	1863
Adj Flow Rate, veh/h				396	0	651	342	1942	0	0	1110	440
Adj No. of Lanes				2	0	1	2	2	0	0	4	1
Peak Hour Factor				0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %				2	0	2	2	2	0	0	2	2
Cap, veh/h				1119	0	515	413	1902	0	0	2234	552
Arrive On Green				0.32	0.00	0.32	0.24	1.00	0.00	0.00	0.35	0.35
Sat Flow, veh/h				3442	0	1583	3442	3632	0	0	6669	1583
Grp Volume(v), veh/h				396	0	651	342	1942	0	0	1110	440
Grp Sat Flow(s),veh/h/ln				1721	0	1583	1721	1770	0	0	1602	1583
Q Serve(g_s), s				7.0	0.0	26.0	7.5	43.0	0.0	0.0	10.9	20.1
Cycle Q Clear(g_c), s				7.0	0.0	26.0	7.5	43.0	0.0	0.0	10.9	20.1
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				1119	0	515	413	1902	0	0	2234	552
V/C Ratio(X)				0.35	0.00	1.27	0.83	1.02	0.00	0.00	0.50	0.80
Avail Cap(c_a), veh/h				1119	0	515	435	1902	0	0	2234	552
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.22	0.22	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				20.6	0.0	27.0	29.6	0.0	0.0	0.0	20.5	23.5
Incr Delay (d2), s/veh				0.2	0.0	134.1	3.0	15.6	0.0	0.0	0.8	11.4
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				3.3	0.0	30.5	3.7	4.1	0.0	0.0	4.9	10.4
LnGrp Delay(d),s/veh				20.8	0.0	161.1	32.6	15.6	0.0	0.0	21.3	34.9
LnGrp LOS				C		F	C	F			C	C
Approach Vol, veh/h					1047			2284			1550	
Approach Delay, s/veh					108.1			18.2			25.2	
Approach LOS					F			B			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		48.5			15.1	33.4		31.5				
Change Period (Y+Rc), s		5.5			5.5	5.5		5.5				
Max Green Setting (Gmax), s		43.0			10.1	27.4		26.0				
Max Q Clear Time (g_c+I1), s		45.0			9.5	22.1		28.0				
Green Ext Time (p_c), s		0.0			0.1	3.7		0.0				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay				39.7								
HCM 2010 LOS				D								

# HCM 2010 Signalized Intersection Summary

## 2: Riverside Ave & I-10 EB Ramps

02/02/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	706	0	290	0	0	0	0	1311	550	453	948	0
Future Volume (veh/h)	706	0	290	0	0	0	0	1311	550	453	948	0
Number	7	4	14				5	2	12	1	6	16
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
Adj Sat Flow, veh/h/ln	1863	0	1863				0	1863	1900	1863	1863	0
Adj Flow Rate, veh/h	793	0	326				0	1473	618	509	1065	0
Adj No. of Lanes	2	0	1				0	3	0	2	2	0
Peak Hour Factor	0.89	0.89	0.89				0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	0	2				0	2	2	2	2	0
Cap, veh/h	860	0	366				0	1538	629	572	2300	0
Arrive On Green	0.25	0.00	0.23				0.00	0.43	0.42	0.33	1.00	0.00
Sat Flow, veh/h	3442	0	1583				0	3713	1451	3442	3632	0
Grp Volume(v), veh/h	793	0	326				0	1407	684	509	1065	0
Grp Sat Flow(s),veh/h/ln	1721	0	1583				0	1695	1607	1721	1770	0
Q Serve(g_s), s	18.0	0.0	15.9				0.0	32.1	33.6	11.2	0.0	0.0
Cycle Q Clear(g_c), s	18.0	0.0	15.9				0.0	32.1	33.6	11.2	0.0	0.0
Prop In Lane	1.00		1.00				0.00		0.90	1.00		0.00
Lane Grp Cap(c), veh/h	860	0	366				0	1470	697	572	2300	0
V/C Ratio(X)	0.92	0.00	0.89				0.00	0.96	0.98	0.89	0.46	0.00
Avail Cap(c_a), veh/h	860	0	366				0	1470	697	572	2300	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	0.88	0.88	0.00
Uniform Delay (d), s/veh	29.2	0.0	29.8				0.0	21.9	23.0	26.0	0.0	0.0
Incr Delay (d2), s/veh	15.1	0.0	22.7				0.0	15.2	30.0	14.4	0.6	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	10.3	0.0	9.3				0.0	17.9	20.6	6.4	0.2	0.0
LnGrp Delay(d),s/veh	44.3	0.0	52.4				0.0	37.1	53.0	40.4	0.6	0.0
LnGrp LOS	D		D					D	D	D	A	
Approach Vol, veh/h		1119						2091			1574	
Approach Delay, s/veh		46.7						42.3			13.5	
Approach LOS		D						D			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	17.3	38.7		24.0		56.0						
Change Period (Y+Rc), s	5.5	5.5		5.5		5.5						
Max Green Setting (Gmax), s	11.8	33.2		18.5		50.5						
Max Q Clear Time (g_c+I1), s	13.2	35.6		20.0		2.0						
Green Ext Time (p_c), s	0.0	0.0		0.0		6.0						
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			33.8									
HCM 2010 LOS			C									

HCM 2010 Signalized Intersection Summary  
 3: Riverside Ave & Slove Ave/Slover Ave

02/02/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	491	227	107	26	9	165	26	1095	16	56	855	288
Future Volume (veh/h)	491	227	107	26	9	165	26	1095	16	56	855	288
Number	7	4	14	3	8	18	5	2	12	1	6	16
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	552	255	120	29	10	185	29	1230	18	63	961	324
Adj No. of Lanes	1	2	0	1	2	0	1	2	0	1	2	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	444	901	412	395	675	604	74	1161	17	155	966	324
Arrive On Green	0.38	0.38	0.38	0.38	0.38	0.38	0.04	0.32	0.32	0.09	0.37	0.37
Sat Flow, veh/h	1183	2362	1080	1003	1770	1583	1774	3571	52	1774	2605	873
Grp Volume(v), veh/h	552	189	186	29	10	185	29	609	639	63	651	634
Grp Sat Flow(s),veh/h/ln	1183	1770	1672	1003	1770	1583	1774	1770	1854	1774	1770	1709
Q Serve(g_s), s	24.0	5.9	6.2	1.7	0.3	6.5	1.3	26.0	26.0	2.7	29.3	29.7
Cycle Q Clear(g_c), s	30.5	5.9	6.2	7.8	0.3	6.5	1.3	26.0	26.0	2.7	29.3	29.7
Prop In Lane	1.00		0.65	1.00		1.00	1.00		0.03	1.00		0.51
Lane Grp Cap(c), veh/h	444	675	638	395	675	604	74	575	602	155	656	634
V/C Ratio(X)	1.24	0.28	0.29	0.07	0.01	0.31	0.39	1.06	1.06	0.41	0.99	1.00
Avail Cap(c_a), veh/h	444	675	638	395	675	604	155	575	602	155	656	634
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	30.5	17.1	17.2	20.0	15.4	17.3	37.4	27.0	27.0	34.5	25.0	25.2
Incr Delay (d2), s/veh	127.1	0.2	0.3	0.1	0.0	0.3	3.4	54.3	53.6	1.7	33.2	35.8
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	25.4	2.9	2.9	0.5	0.1	2.9	0.7	21.3	22.2	1.4	20.3	20.2
LnGrp Delay(d),s/veh	157.5	17.4	17.5	20.0	15.4	17.6	40.7	81.3	80.6	36.2	58.2	61.0
LnGrp LOS	F	B	B	C	B	B	D	F	F	D	E	F
Approach Vol, veh/h		927			224			1277			1348	
Approach Delay, s/veh		100.9			17.8			80.0			58.5	
Approach LOS		F			B			F			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	12.5	31.5		36.0	8.8	35.2		36.0				
Change Period (Y+Rc), s	5.5	5.5		5.5	5.5	5.5		5.5				
Max Green Setting (Gmax), s	7.0	26.0		30.5	7.0	26.0		30.5				
Max Q Clear Time (g_c+I1), s	4.7	28.0		32.5	3.3	31.7		9.8				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	0.0		1.3				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			73.8									
HCM 2010 LOS			E									