

APPENDIX F

City of Riverside Roadway Capacity

Exhibit D**City of Riverside Roadway Capacity⁽¹⁾**

Roadway Classification	Number of Lanes	Two-Way Traffic Volume (ADT) ⁽²⁾		
		Service Level C	Service Level D	Service Level E
Local	2	2,500-2,799	2,800-3,099	3,100+
Collector (66' or 80')	2	9,900-11,199	11,200-12,499	12,500+
Arterial ⁽³⁾	2	14,400-16,199	16,200-17,999	18,000+
Arterial (88')	4	16,800-19,399	19,400-21,199	22,000+
Arterial (100')	4	26,200-29,599	29,600-32,999	33,000+
Arterial (120')	6	38,700-44,099	44,100-49,499	49,500+
Arterial (144')	8	50,600-57,799	57,800-64,999	65,000+

Notes: (1) All capacity figures are based on optimum conditions and are intended as guidelines for planning purposes only

(2) Maximum two-way ADT values are based on the 1999 Modified Highway Capacity Manual Level of Service Tables

(3) Two-lane roadways designated as future arterials that conform to arterial design standards for vertical and horizontal alignments are analyzed as arterials.

APPENDIX G

Cumulative Traffic Volumes

1. **PLANNING CASES P09-0185**: Proposal by Taso Politis for a Conditional Use Permit to establish a drive-thru restaurant use within an existing vacant 280-square-foot drive-thru building on an approximately .9-acre lot also developed with an auto repair facility located at 7590 Indiana Avenue, situated on the southerly side of Indiana Avenue, between Madison Street and Winstrom Street, in the CG– Commercial General Zone, in Ward 4.
2. **PLANNING CASE P10-0438**: DR; Magnolia Garden Condominiums.
3. **PLANNING CASE P14-0450**: Revised CUP; to establish classrooms and laboratories within 5 office and warehouse lease spaces; California Baptist University.
4. **PLANNING CASE P14-0673; P14-0675; P14-0928**: CUP, LC, PC or N; Walgreens with Drive Thru Pharmacy.
5. **PLANNING CASE P15-0847**: CUP: Madison Plaza – Conditional Use Permit and Initial Study to allow a full-service health club in conjunction with a 38,000-square foot health club operating 24 hours per day Monday through Sunday.
6. **PLANNING CASES P12-0184; P12-0185; P12-0187**: General Plan Amendment to change property from MDR to C; Rezoning from R-1-7000 to C; and Design review to facilitate the construction of a multiple tenant retail building on a two parcel site, known as the Azar Plaza.
7. **PLANNING CASE P09-0147**: Proposal by Shackelton Consulting, on behalf of Hamblins Body Paint & Frame, Inc., for a Conditional Use Permit to allow new and used car sales, accessory and tire sales/installation, and auto body repair and painting within an existing 12,510 square foot building located at 7840 Indiana Avenue, situated on the southerly side of Indiana Avenue, easterly of Jefferson Street, in the CG – SP – Commercial General and Auto Center Specific Plan Overlay Zones, in Ward # 4.

Trip Generation Calcs for NEW CBU Traffic List - FINAL

1. P09-0185

(ITE 8th Ed.)

280 ft² Drive-thru (935)

ITE - Not enough data

Used (934), $X = 0.28$

Used avg. rate

AM - 49.35 trips (280/1000) = 13 trips in AM (7 IN / 6 OUT)

PM - 33.84 trips (280/1000) = 10 trips in PM (6 IN / 5 OUT)

ADT: $T = 494.12 (280/1000) = 139$

~~P09-0811~~

~~(ITE 8th Ed.)~~

~~4,402 Vet Clinic (440); $X = 4$~~

~~- Not enough data in ITE, but based on what is given:~~

~~AM: $T = 4.08 (4402/1000) = 18$ trips (13 IN / 5 OUT)~~

~~PM: $T = 4.72 (4402/1000) = 21$ trips (8 IN / 13 OUT)~~

2. P10-0438

(ITE 9th Ed.)

NOTE: Used "apartments", NOT condos (see Google Earth)

102 dwelling units; 3.1 ac; Use (220); $X = 0.2$

AM: $T = 0.49 (X) + 3.73 = 30$ trips (6 IN / 24 OUT)

PM: $T = 0.55 (X) + 17.05 = 52$ trips (34 IN / 18 OUT)

ADT: $T = 0.06 (X) + 23.56 = 499.28$

3. P14-0450

5 office & warehouse lease spaces for CBU use; 9,085 ft² (710); $X = \frac{9085}{1000} = 9$

AM: $\ln(T) = 0.80 \ln(X) + 1.57 = 28$ trips (25 IN / 3 OUT)

PM: $T = 1.12 X + 78.45 = 89$ trips (151 / 74 OUT)

ADT: $\ln(T) = 0.74 \ln(X) + 3.08 = 21$ trips

do not include minimal traffic impact

4. P14-0073; P14-0075; P14-0928

Walgreens w/ Drive-thru Rx - 10,776 ft² (881); X = 10,776/1,000
- Not given fitted equation in ITE; used avg. rate.

$$\begin{aligned} \text{AM: } T &= 3.45 (10,776/1,000) = 37 \text{ trips (19 IN / 18 OUT)} \\ \text{PM: } T &= 9.91 (10,776/1,000) = 107 \text{ trips (54 IN / 53 OUT)} \\ \text{ADT: } T &= 90.91 (10,776/1,000) = 1,044 \end{aligned}$$

5. P15-0847

38,000 ft² health club (492); X = 38
- Not given fitted equation in ITE (for AM only); used avg. rate.

$$\begin{aligned} \text{AM: } T &= 1.41 (38,000/1,000) = 54 \text{ trips (27 IN / 27 OUT)} \\ \text{PM: } \ln(T) &= 0.95 \ln(X) + 1.43 = 132 \text{ trips (75 IN / 57 OUT)} \\ \text{ADT: } T &= 32.93 (38,000/1,000) = 38 \text{ (p. 940)} \end{aligned}$$

6. P12-0184; P12-0185; P12-0183

61,150 ft² multiple tenant retail building (710) X = 61,150/1,000

$$\begin{aligned} \text{AM: } \ln(T) &= 0.80 \ln(X) + 1.57 = 21 \text{ trips (19 IN / 2 OUT)} \\ \text{PM: } T &= 1.12 (X) + 78.45 = 85 \text{ trips (15 IN / 70 OUT)} \\ \text{ADT: } \ln(T) &= 0.76 \ln(X) + 3.68 = 158 \end{aligned}$$

7. P09-0147

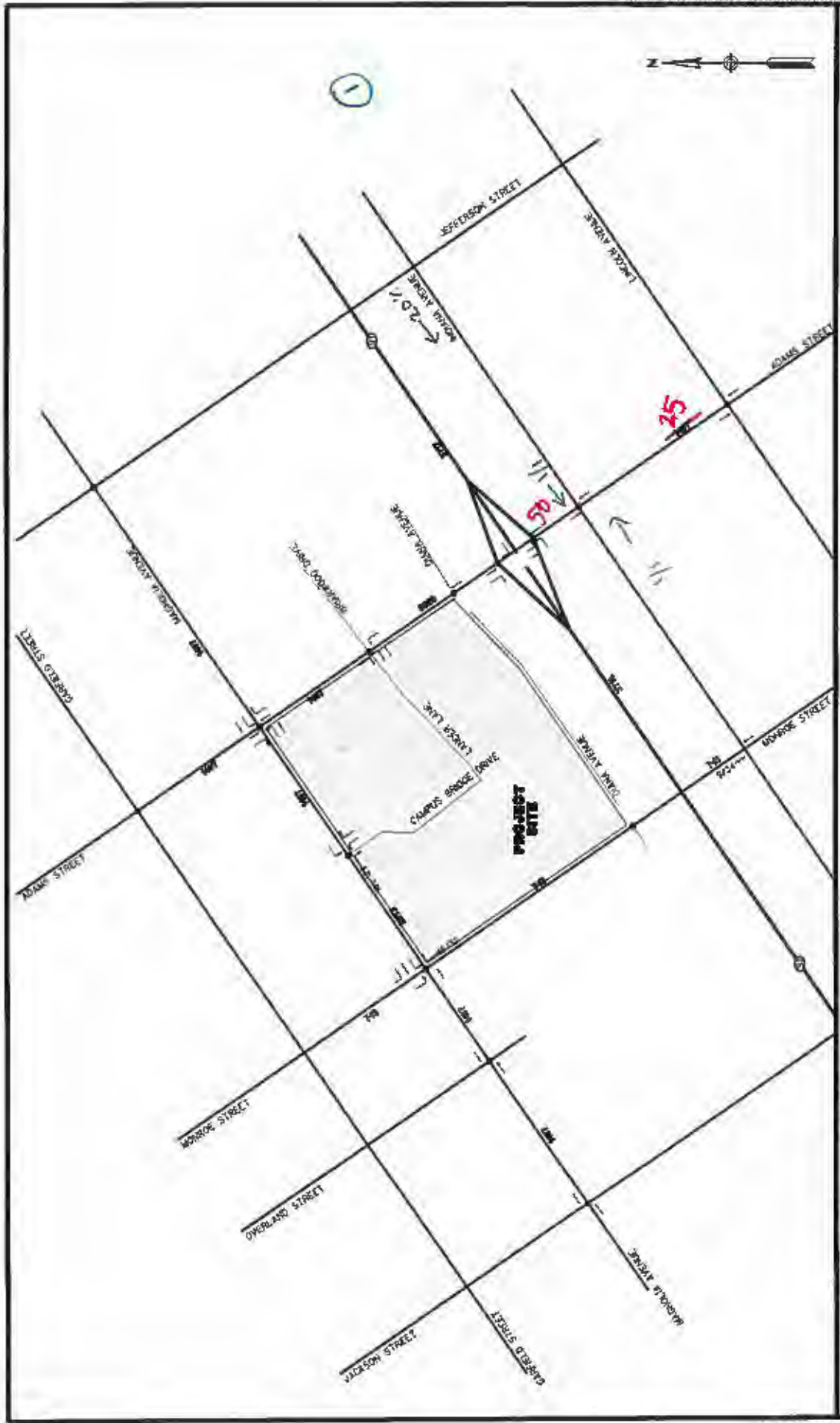
New/used car sales, accessory/tire sales/install, 2 auto body repair in 12,510 ft² building
↳ Assume: Auto parts sales b/c it's the highest rate of AM/PM (generator)

(Land use: 843)

$$\begin{aligned} \text{AM: } T &= 2.76 (X) - 4.34 = 30 \text{ trips (Assume 15 IN / 15 OUT)} \\ \text{PM: } T &= 7.87 (X) - 14.86 = 84 \text{ trips (41 IN / 43 OUT)} \\ \text{ADT: } T &= 81.02 (12,510) - 150.95 = 663 \end{aligned}$$

$$\begin{aligned} &\uparrow \\ &\frac{12,510}{1,000} = 12.51 \end{aligned}$$

03/29/2010
 YS



SECTION
 XX/XX - AN PEAK HOUR/PEAK HOUR
 XXXX - ADT

EXHIBIT 7
 PROJECT TRAFFIC ASSIGNMENT
 CALIFORNIA BAPTIST UNIVERSITY TRAFFIC ANALYSIS

5620 FRANKS ROAD
 SAN DIEGO, CA 92118
 619.291.0707
 FAX: 619.291.4165
RICK
 ENGINEERS/PLANNERS

Planning Case
 (1) PO9-0185
 Drive thru restaurant

TOTAL IN = 7/0
 OUT = 10/5

ATTN: ACTION

1201 vs.



PROJECT TRAFFIC ASSIGNMENT

CALIFORNIA BAPTIST UNIVERSITY TRAFFIC ANALYSIS

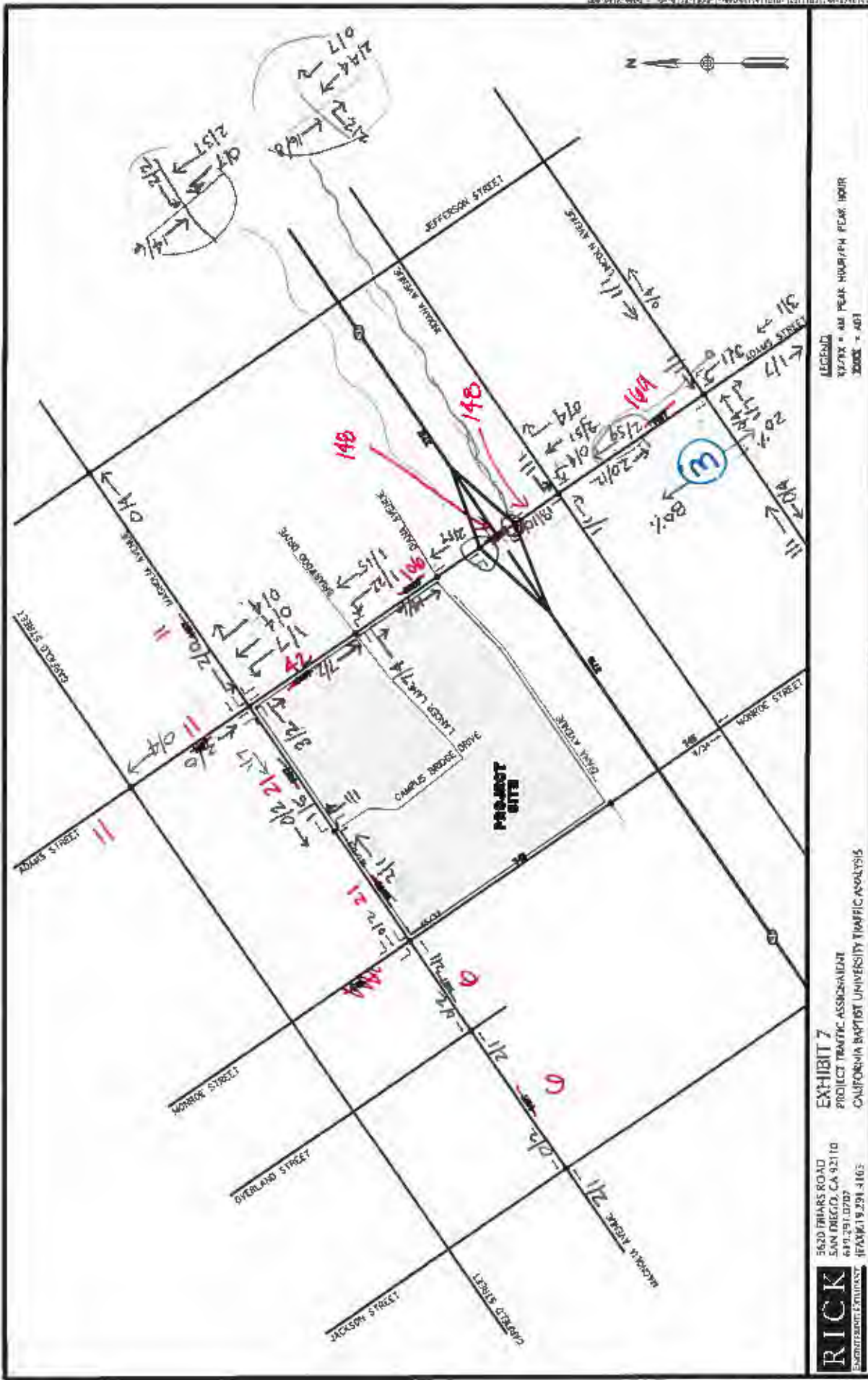
LEGEND:
 XAXZCZ = AM PEAK HOUR/PM PEAK HOUR
 XXXX = AGT

② Planning Case P10-0438

Magnolia Gardens Condominiums

ATX-499

VS



Classroom/Labs in office/warehouse for CBQ.

Total $\Rightarrow$ IN - 25/15

OUT-3174 (1/10)

44-7-251



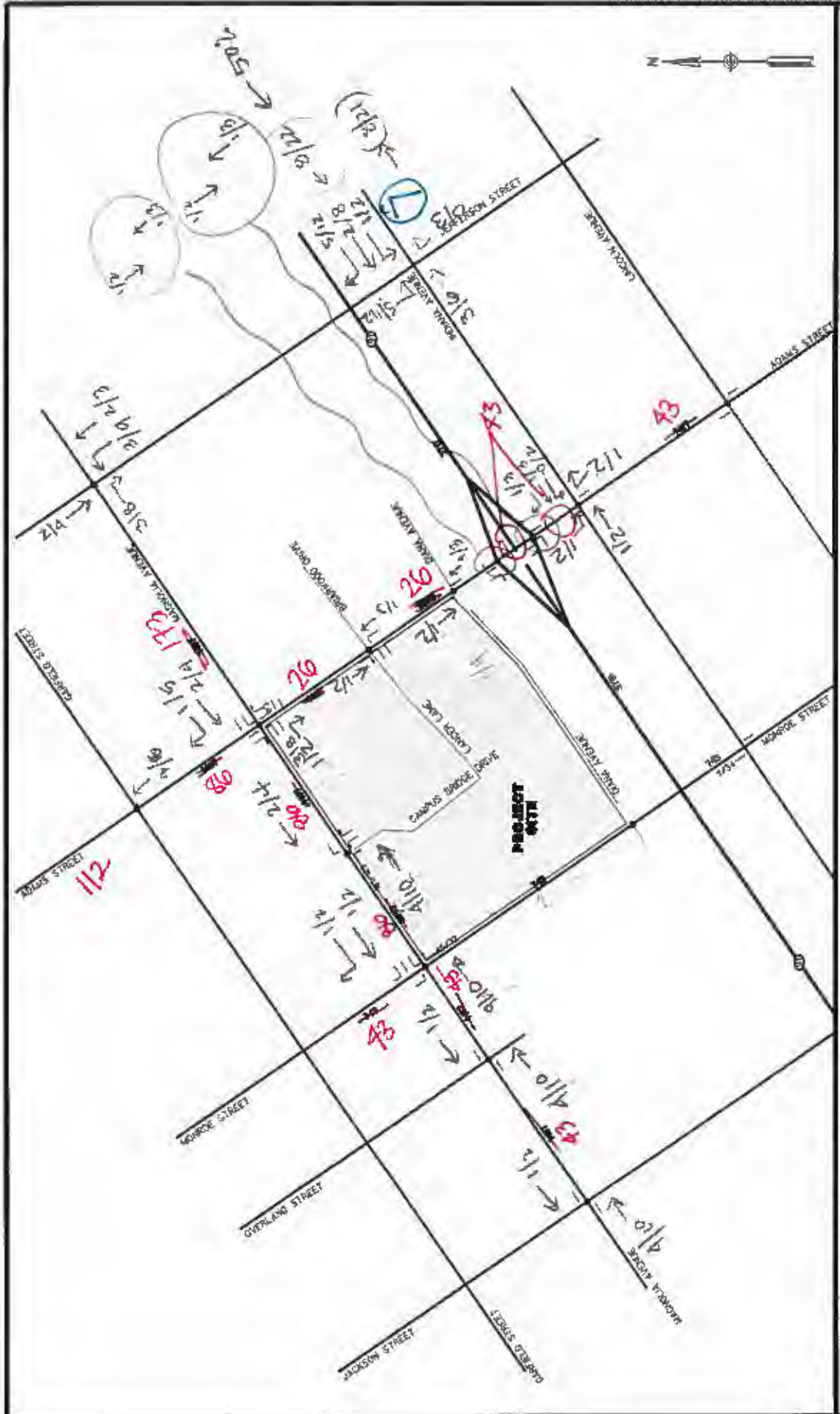
EXHIBIT 7
PROJECT TRAFFIC ASSIGNMENT
CALIFORNIA BAPTIST UNIVERSITY

LEGEND
 XXX/YY = AM PEAK HOUR/PM PEAK HOUR
 XXXX = AM

$$\text{Total} \Rightarrow 121 = 10/15$$

4-9-77 - 1951A

0107147101



RICK
 ENGINEERS/PLANNERS
 5430 FRIARS ROAD
 SAN DIEGO, CA 92110
 619.291.0700
 (FAX) 619.291.4165

EXHIBIT 7
 PROJECT TRAFFIC ASSIGNMENT
 CALIFORNIA BAPTIST UNIVERSITY TRAFFIC ANALYSIS

① Planning case P09-0147
 Car/tires sales & auto repair/paint

Total $\Rightarrow$ IN = 15/41
 OUT = 15/43
 NOT - 9103

APPENDIX H

Buildout Analysis

August 24, 2016

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Rick Engineering Company
5620 Friars Road
San Diego, CA 92110

SUBJECT: CALIFORNIA BAPTIST UNIVERSITY PROJECT MODELING SUPPORT

The enrollment in California Baptist University ("Project") is proposed to be increased to a maximum of 12,000 students. Model run for the 2035 Without Project traffic conditions was based on the current version of the 2035 Riverside County Transportation and Analysis Model (RivTAM), which is a focused model based on the Southern California Associated Governments (SCAG) TransCAD model. The current 2035 RivTAM model socio-economic data (SED) consists of 933 households and enrollment of 4,086 students for the traffic analysis zone (TAZ) where the Project is located (TAZ 3376).

Adjustments to SED were made to reflect the increase in enrollment to 12,000. In addition, increase in number of households was calculated based on the ratio of projected maximum number of beds for student housing with Project current maximum number of beds for students housing. California Baptist University (CBU) currently houses a total of 3,000 student beds based on data in CBU Specific Plan. The projected number of beds with Project is 3,961 student bed based on data provided by the applicant, which is an increase of 32%. As such the number of households in current 2035 RivTAM were increased by 32% to 1,231 households in TAZ 3376 to perform the 2035 With Project model run.

SED for TAZ 3376 in the RivTAM model

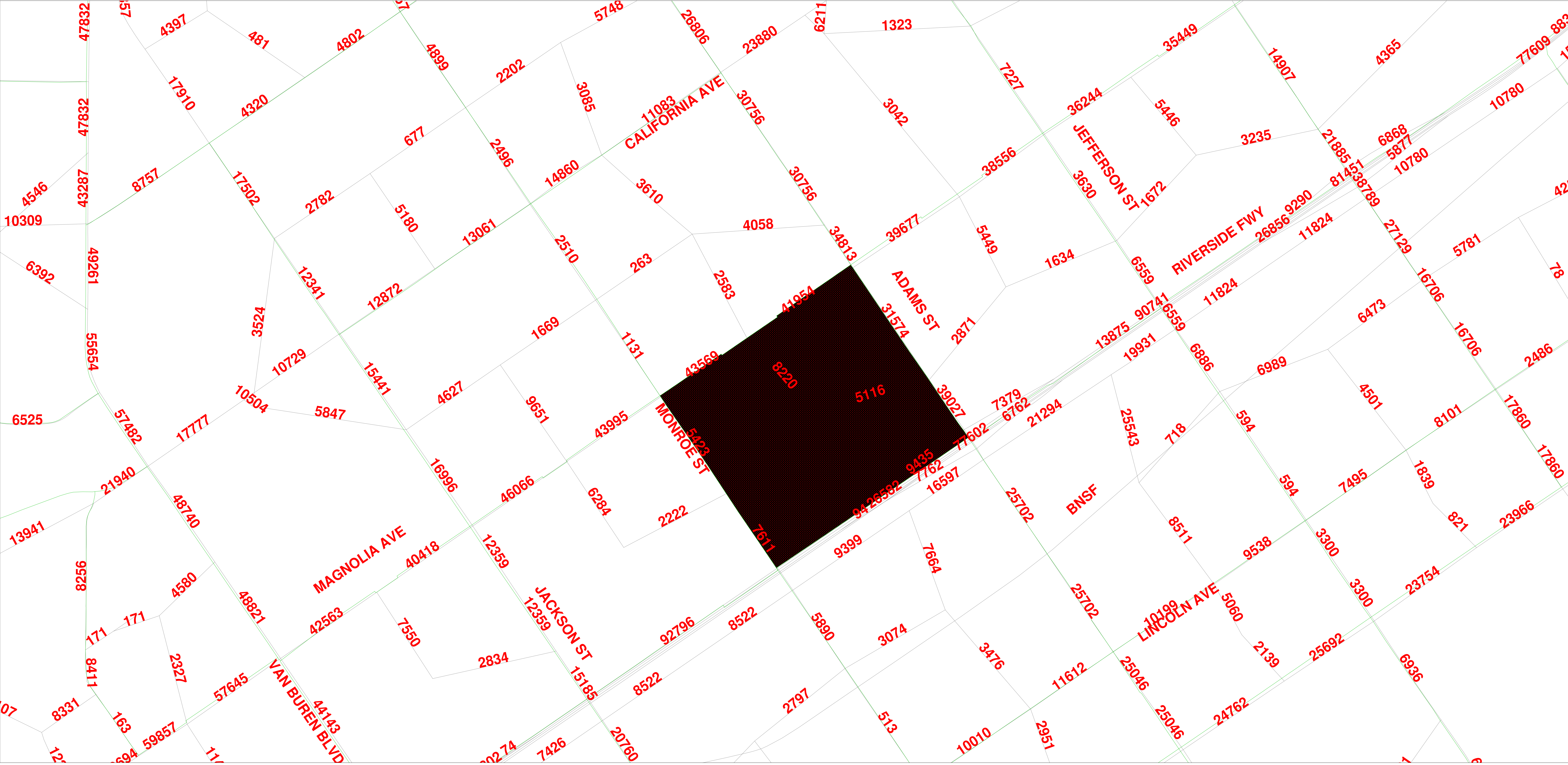
seq_	cnty	District	POP	RES	HH	K12
3376	Riverside	4	3546	3126	1231	0

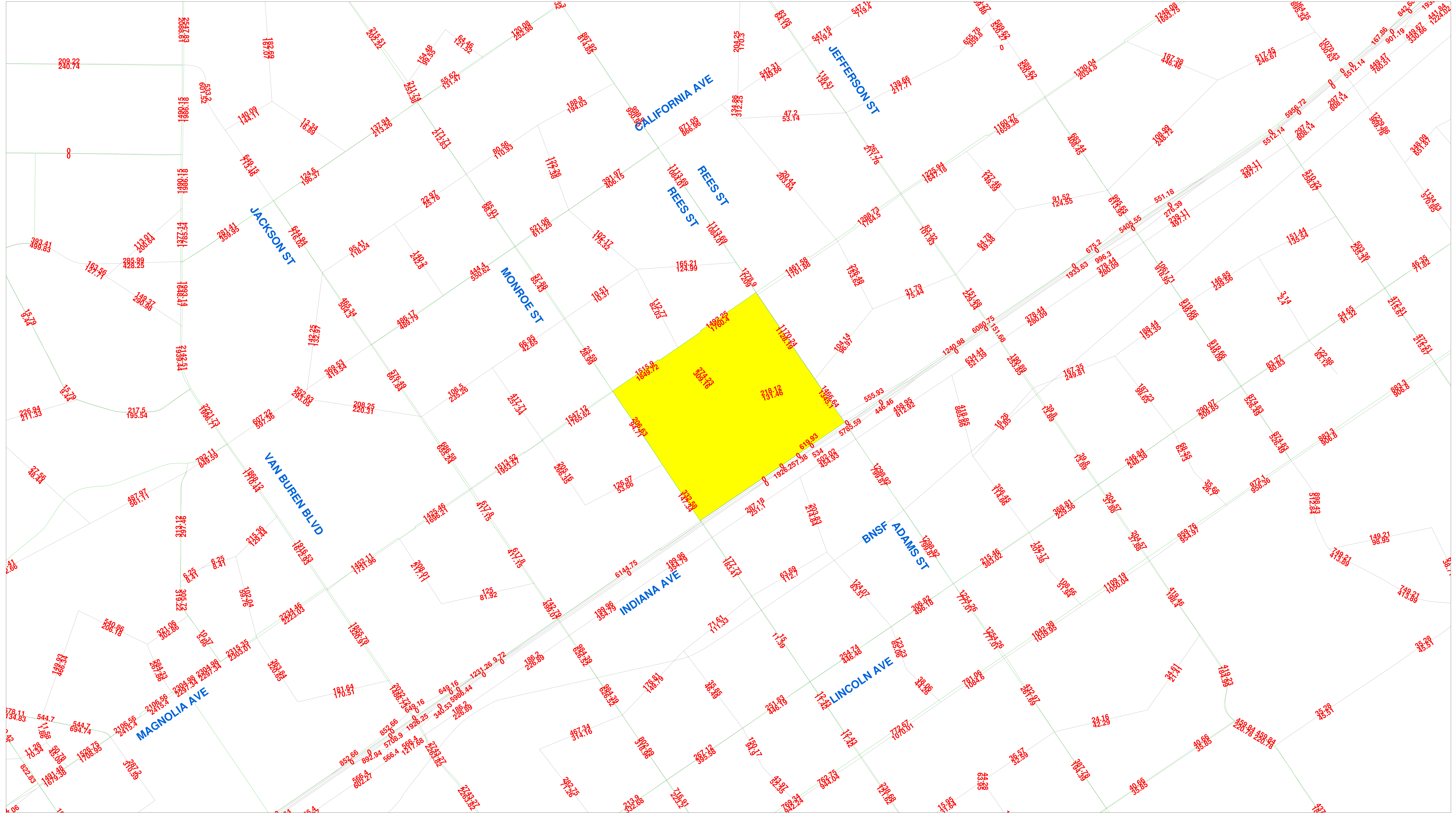
COLLEGE	Tot_emp	Ag_emp	Const_emp	Manu_emp	Whole_emp	Ret_emp
12000	1284	1	26	6	9	120

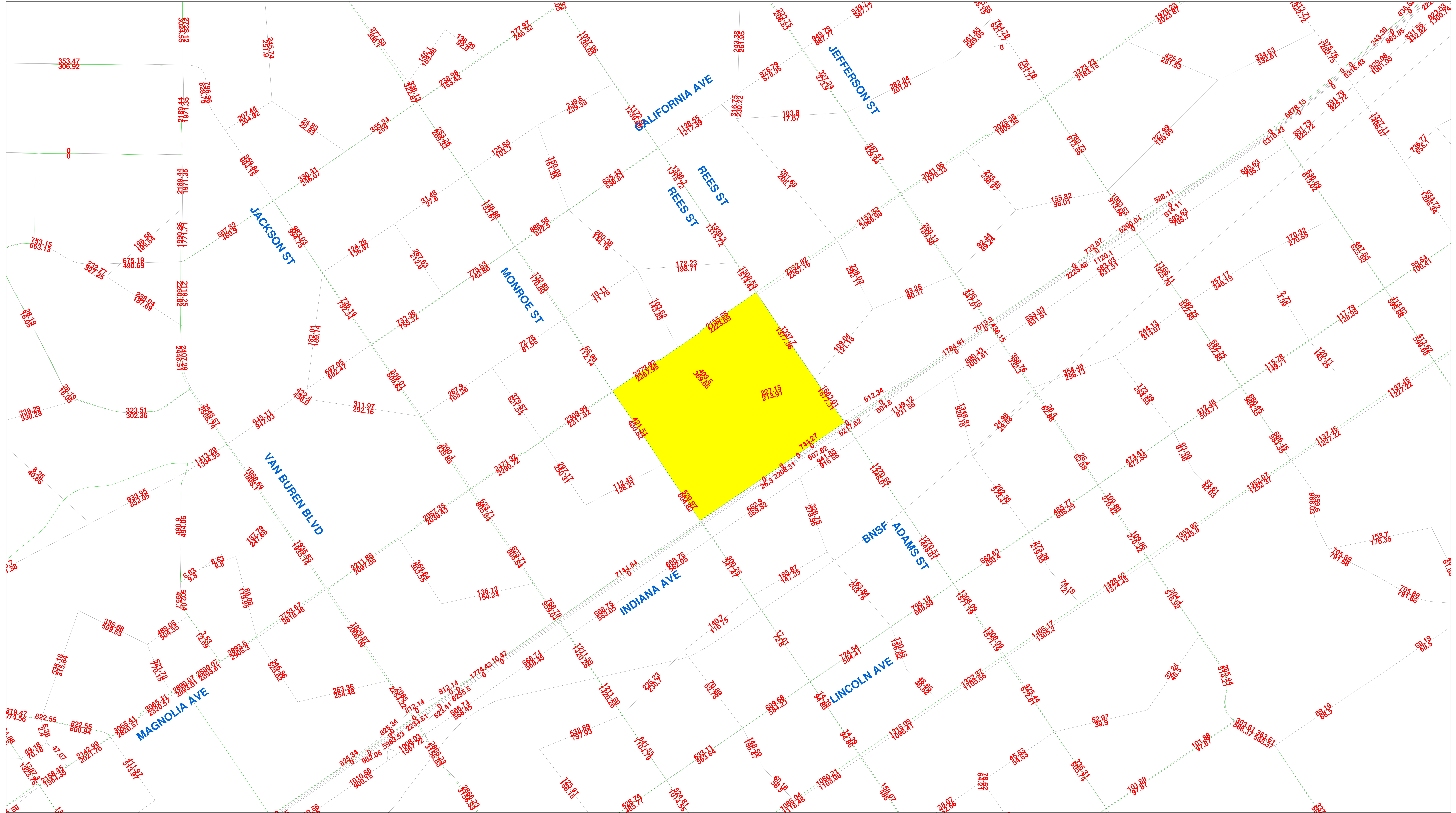
Trans_emp	Infor_emp	FIRE_emp	Prof_emp	Educ_emp	ArtEnt_emp	OthSer_emp
7	24	77	75	628	258	43

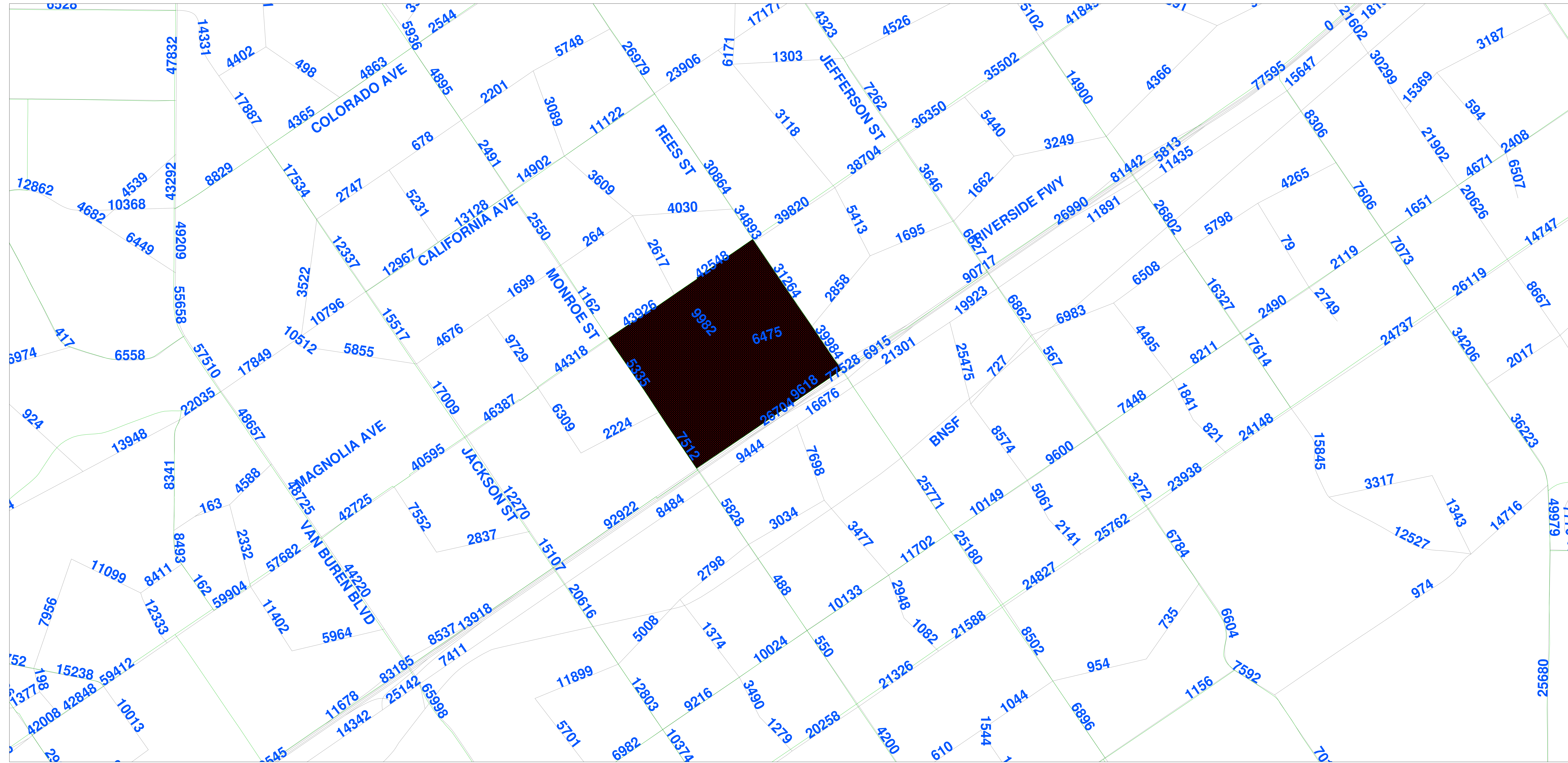
California Baptist University
Trips Generated Per Bed or Student Calculation

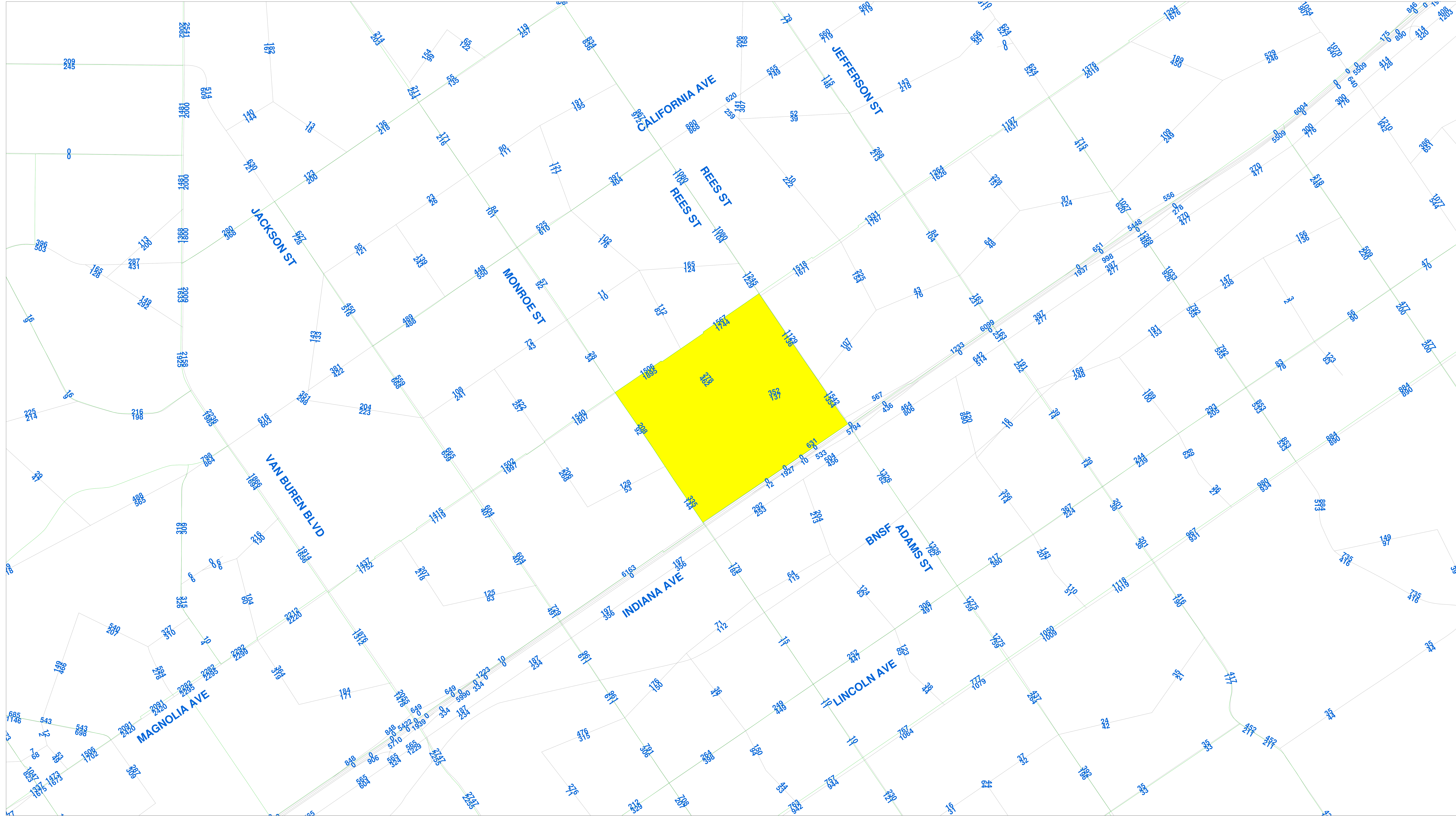
	Existing	Existing + Ambient + Project	Buildout Model Run
Number of Students	8,323	12,000	12,000
Number of Beds	3,000	3,961	3,961
ADT	11,989	17,280	16,457
AM Peak Hour Trips	731	1,088	1,785
PM Peak Hour Trips	910	1,330	2,123
<i>Daily Trips per Bed</i>	<i>4.00</i>	<i>4.36</i>	<i>4.15</i>
<i>AM Peak Hour Trips per Bed</i>	<i>0.24</i>	<i>0.27</i>	<i>0.45</i>
<i>PM Peak Hour Trips per Bed</i>	<i>0.30</i>	<i>0.34</i>	<i>0.54</i>
<i>Daily Trips per Student</i>	<i>1.44</i>	<i>1.44</i>	<i>1.37</i>
<i>AM Peak Hour Trips per Student</i>	<i>0.09</i>	<i>0.09</i>	<i>0.15</i>
<i>PM Peak Hour Trips per Student</i>	<i>0.11</i>	<i>0.11</i>	<i>0.18</i>

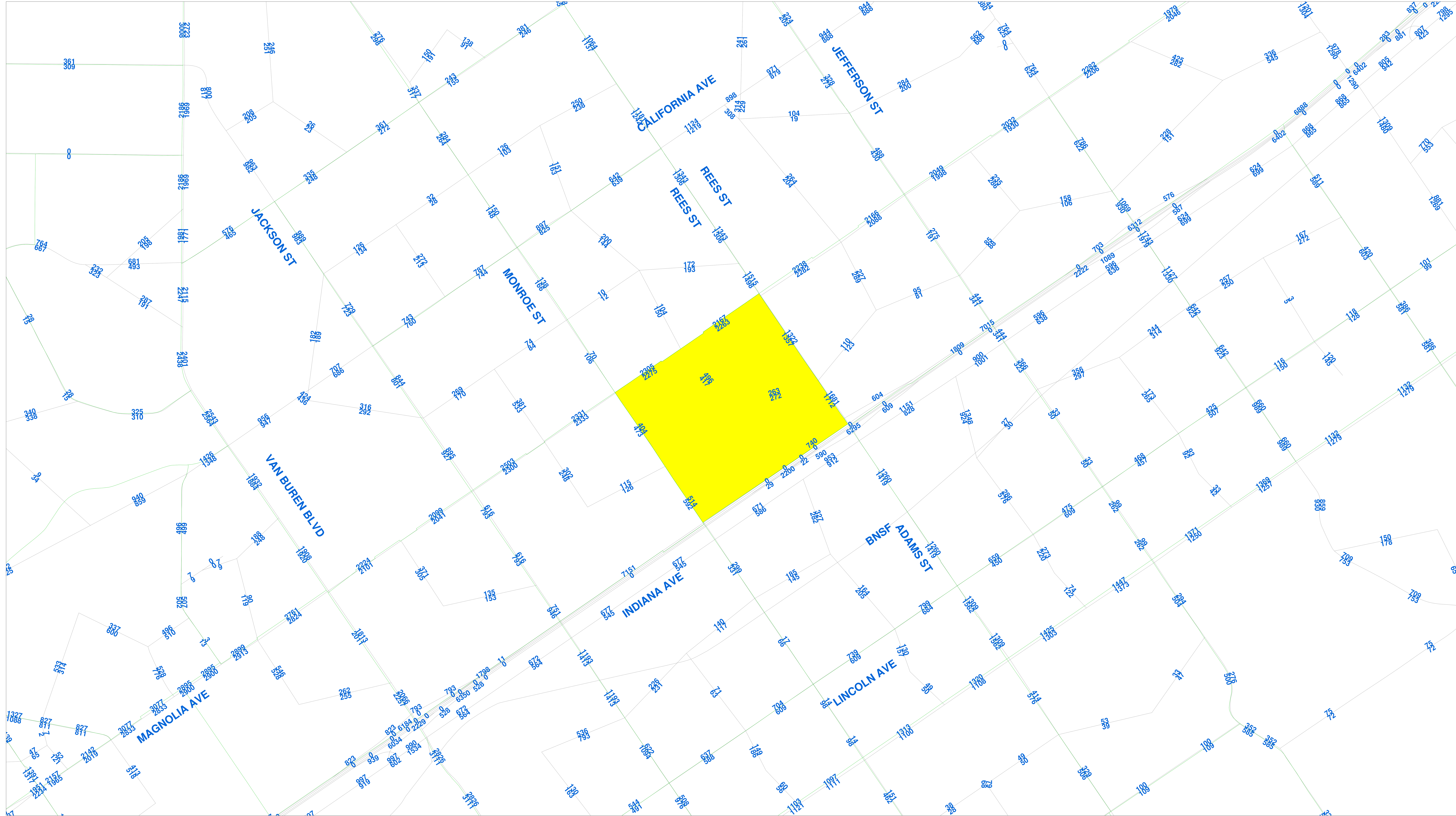








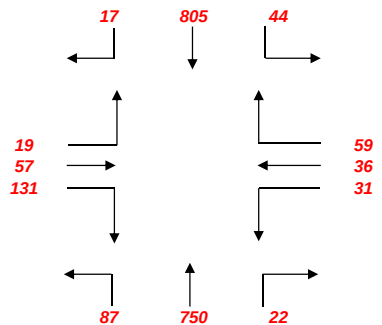




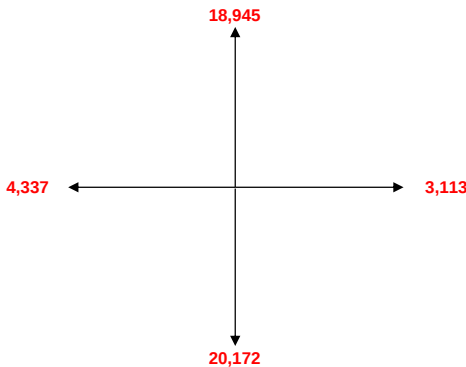
Year 2025 AM Peak Hour Turning Movement Calculations w/o Project

Adams Street and Garfield Street

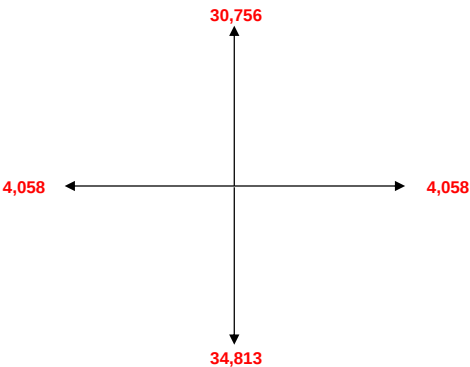
Existing Peak Hour Turning Movement Volumes (AM)



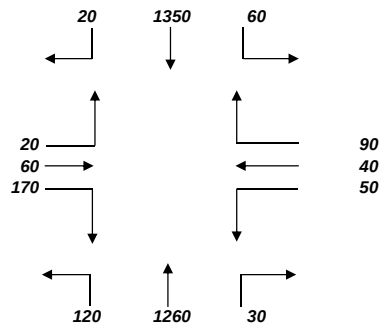
Existing ADTs



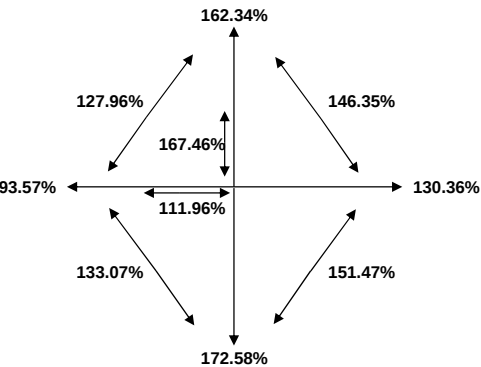
2025 ADTs



2025 Peak Hour Turning Movement Volumes (Calculated)



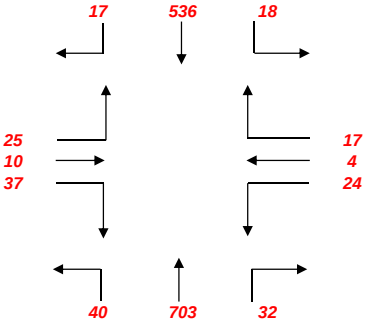
percent increase/decrease



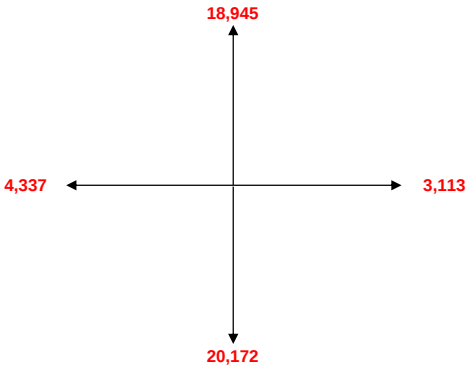
Year 2025 PM Peak Hour Turning Movement Calculations w/o Project

Adams Street and Garfield Street

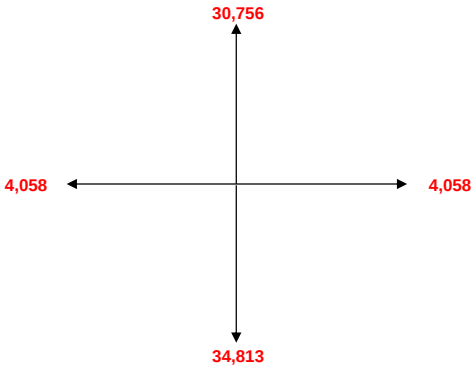
Existing Peak Hour Turning Movement Volumes (PM)



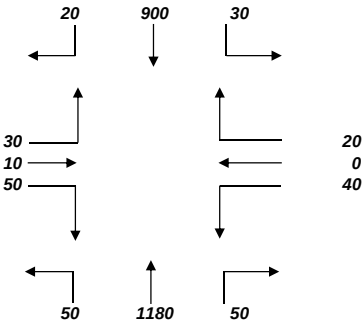
Existing ADTs



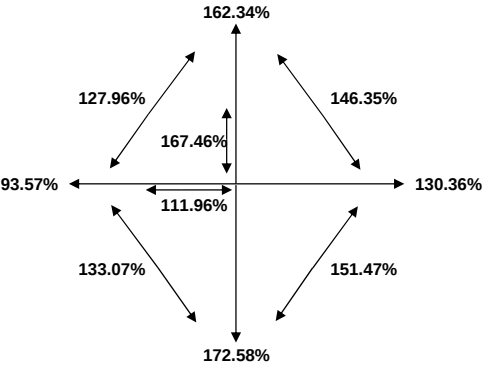
2025 ADTs



2025 Peak Hour Turning Movement Volumes (PM-Calculated)



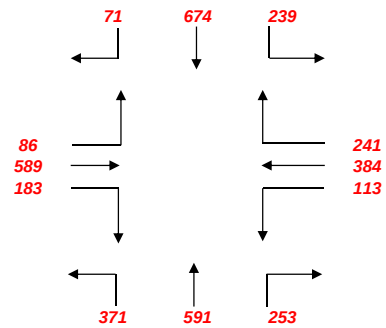
percent increase/decrease



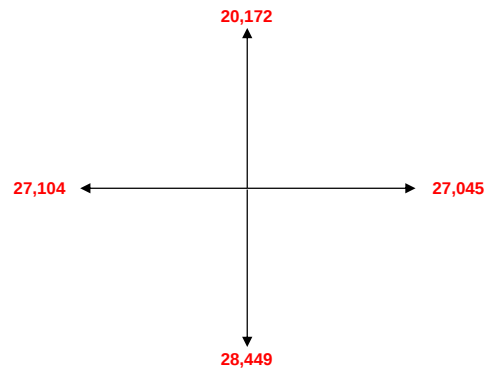
Year 2025 AM Peak Hour Turning Movement Calculations w/o Project

Adams Street and Magnolia Avenue

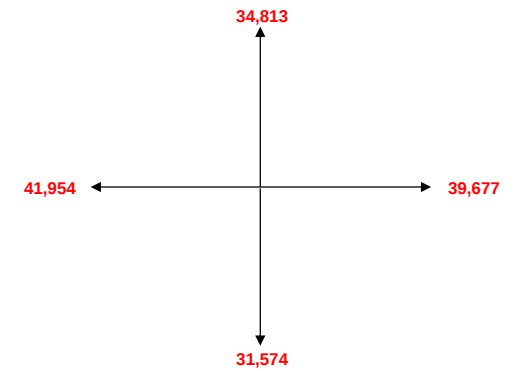
Existing Peak Hour Turning Movement Volumes (AM)



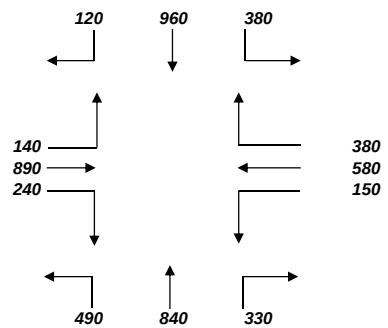
Existing ADTs



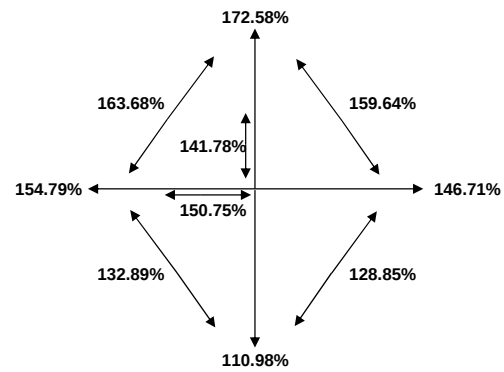
2025 ADTs



2025 Peak Hour Turning Movement Volumes (Calculated)



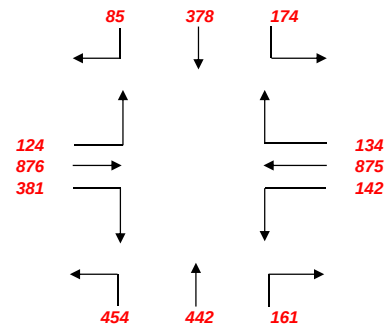
percent increase/decrease



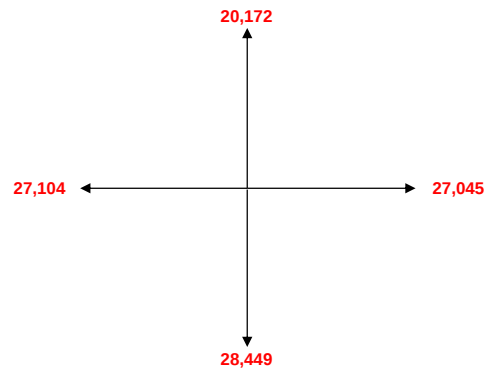
Year 2025 PM Peak Hour Turning Movement Calculations w/o Project

Adams Street and Magnolia Avenue

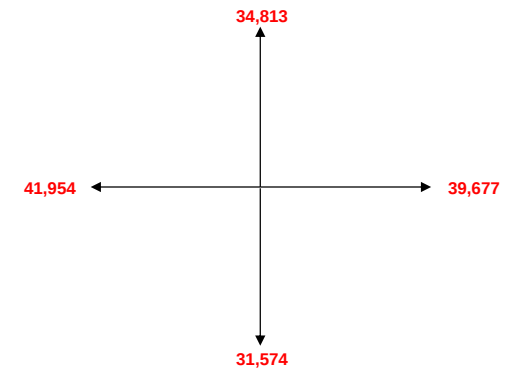
Existing Peak Hour Turning Movement Volumes (PM)



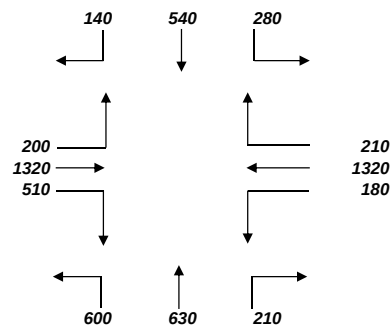
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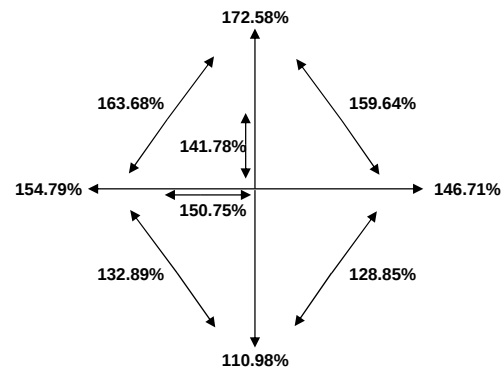
2025 ADTs



2025 Peak Hour Turning Movement Volumes (PM-Calculated)



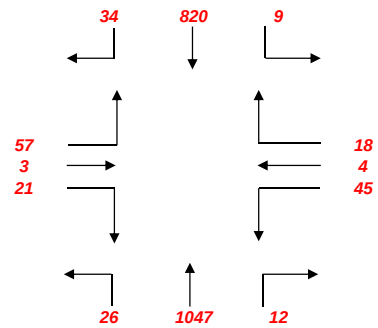
percent increase/decrease



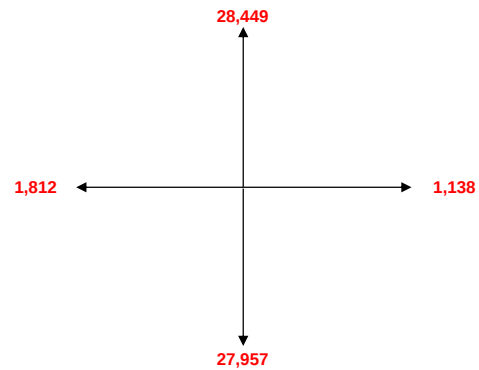
Year 2025 AM Peak Hour Turning Movement Calculations w/o Project

Adams Street and Lancer Lane/Briarwood Drive

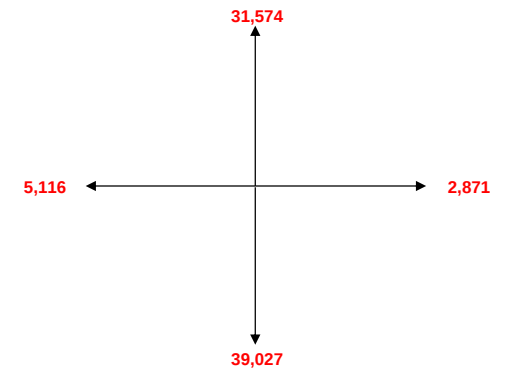
Existing Peak Hour Turning Movement Volumes (AM)



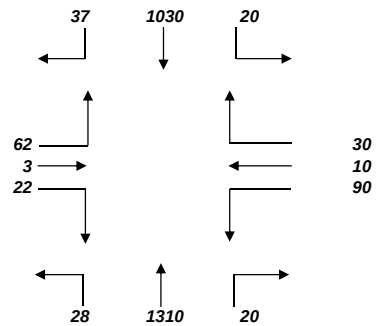
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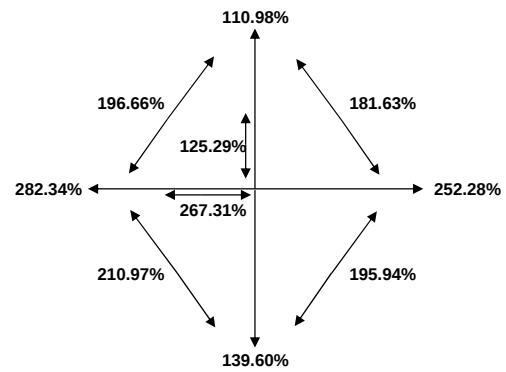
2025 ADTs



2025 Peak Hour Turning Movement Volumes (Calculated)



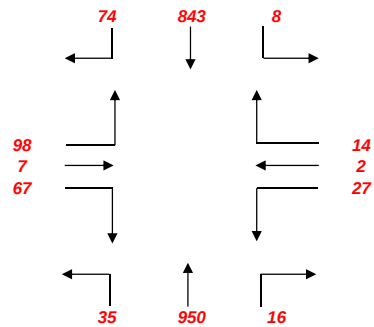
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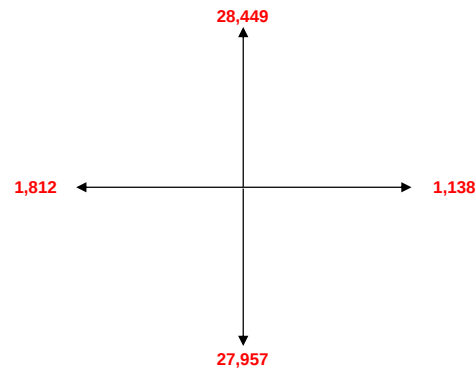
Year 2025 PM Peak Hour Turning Movement Calculations w/o Project

Adams Street and Lancer Lane/Briarwood Drive

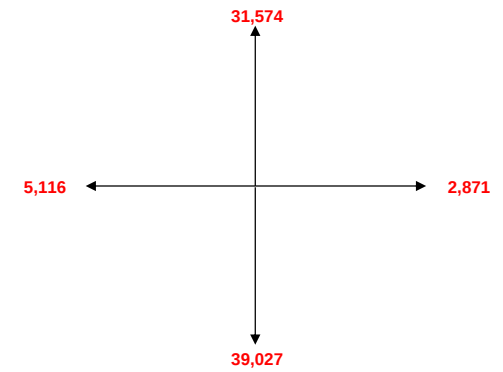
Existing Peak Hour Turning Movement Volumes (PM)



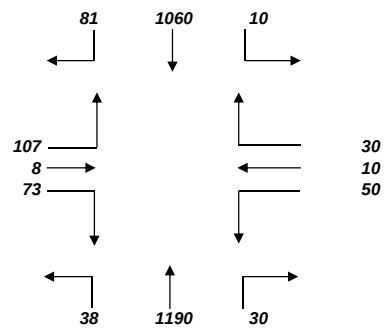
Existing ADTs



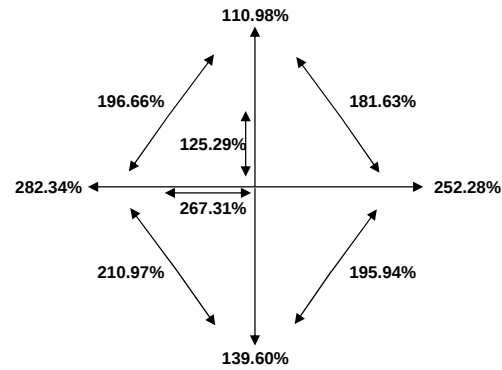
2025 ADTs



2025 Peak Hour Turning Movement Volumes (PM-Calculated)



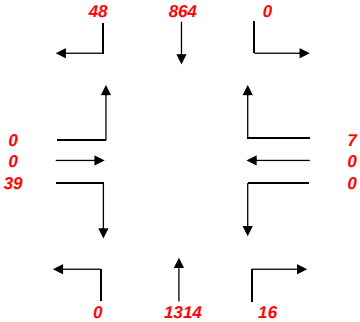
percent increase/decrease



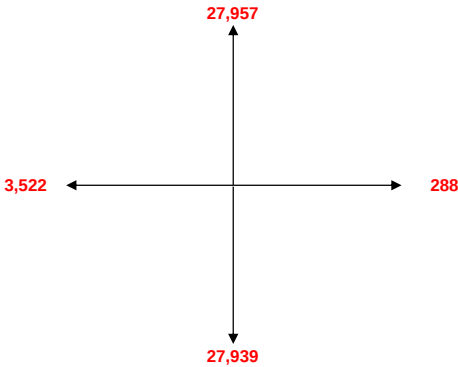
Year 2025 AM Peak Hour Turning Movement Calculations w/o Project

Diana Avenue and Adams Street

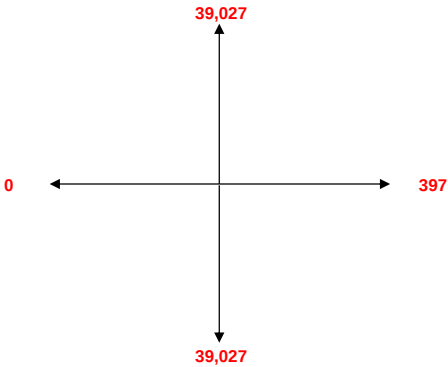
Existing Peak Hour Turning Movement Volumes (AM)



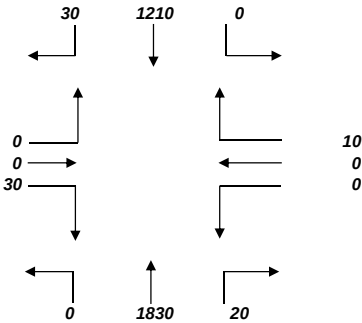
Existing ADTs



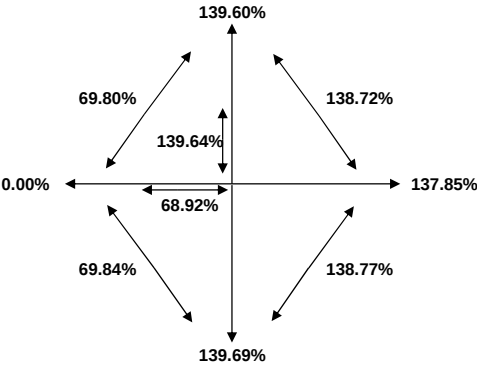
2025 ADTs



2025 Peak Hour Turning Movement Volumes (Calculated)



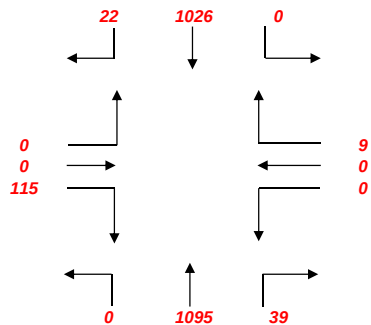
percent increase/decrease



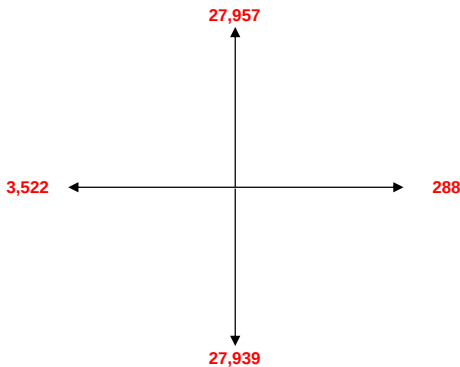
Year 2025 PM Peak Hour Turning Movement Calculations w/o Project

Diana Avenue and Adams Street

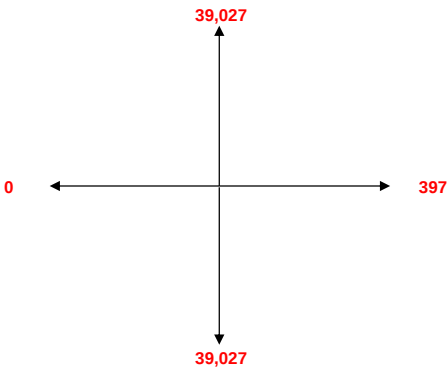
Existing Peak Hour Turning Movement Volumes (PM)



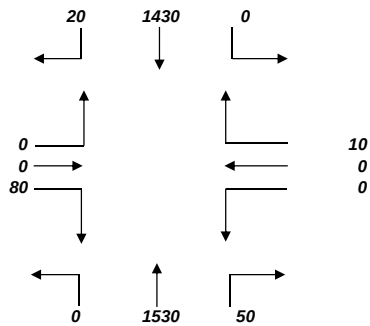
Existing ADTs



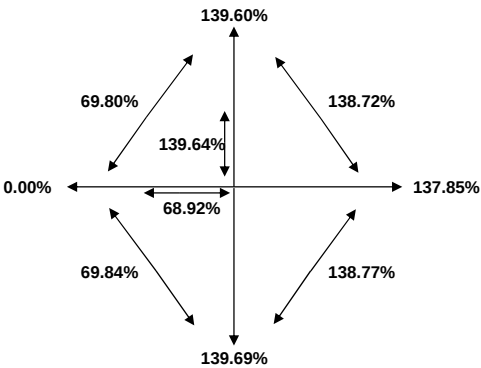
2025 ADTs



2025 Peak Hour Turning Movement Volumes (PM-Calculated)



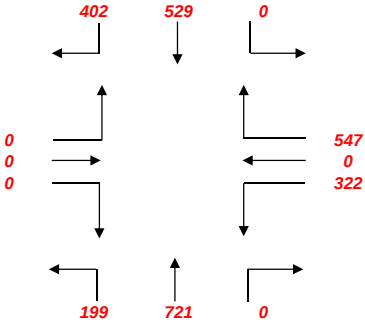
percent increase/decrease



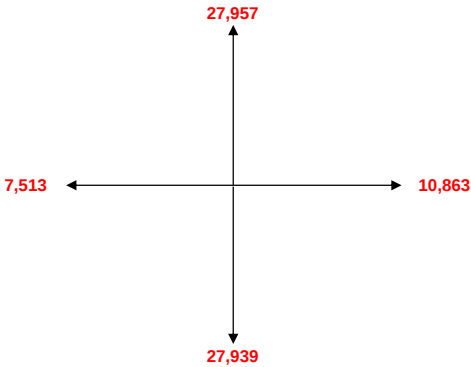
Year 2025 AM Peak Hour Turning Movement Calculations w/o Project

Adams Street and Westbound 91 Ramps

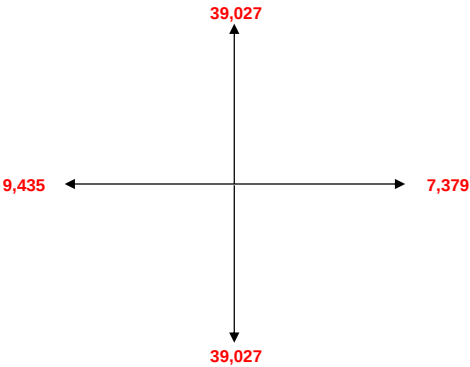
Existing Peak Hour Turning Movement Volumes (AM)



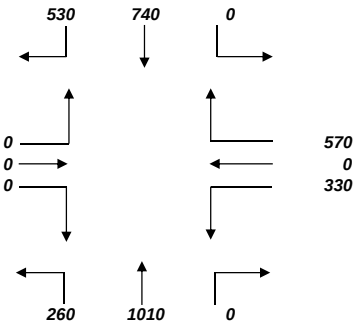
Existing ADTs



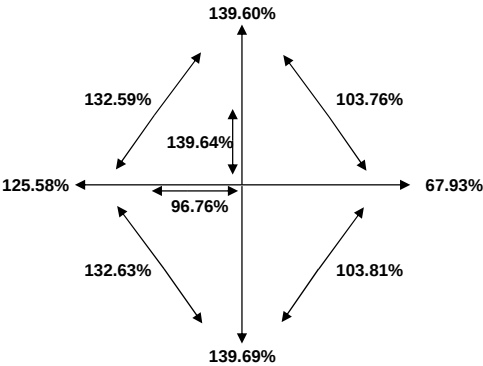
2025 ADTs



2025 Peak Hour Turning Movement Volumes (Calculated)



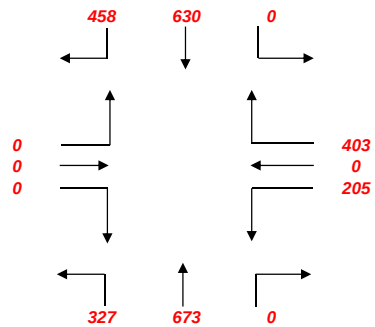
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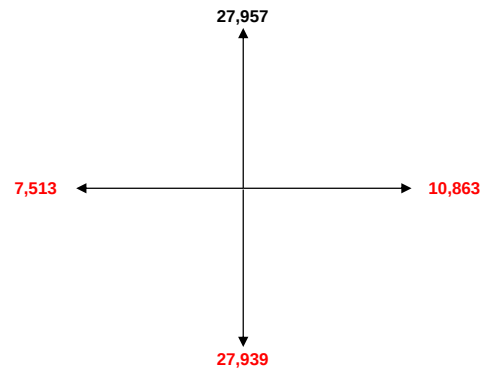
Year 2025 PM Peak Hour Turning Movement Calculations w/o Project

Adams Street and Westbound 91 Ramps

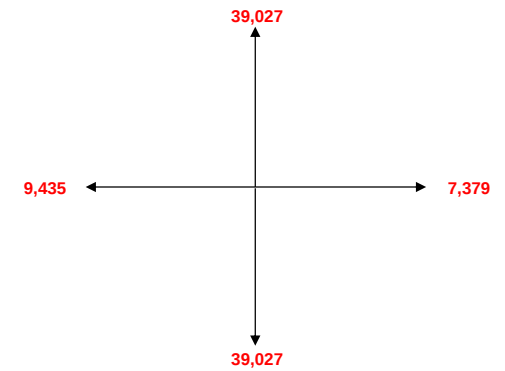
Existing Peak Hour Turning Movement Volumes (PM)



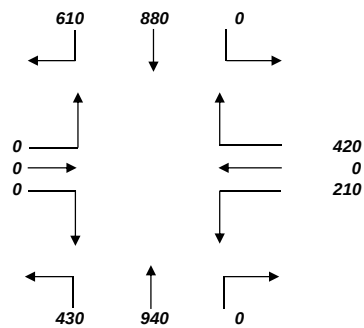
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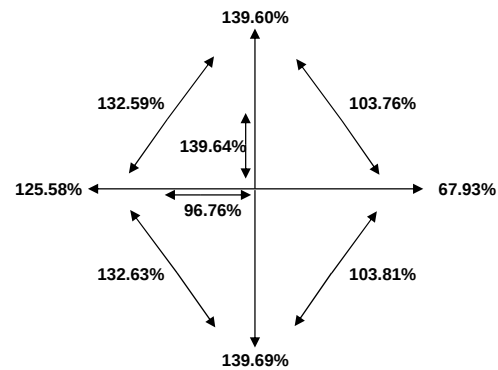
2025 ADTs



2025 Peak Hour Turning Movement Volumes (PM-Calculated)



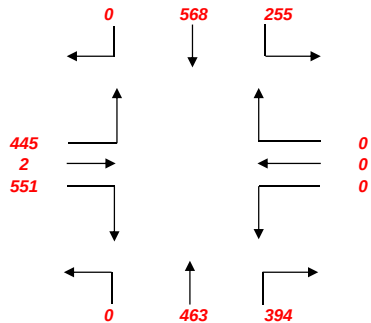
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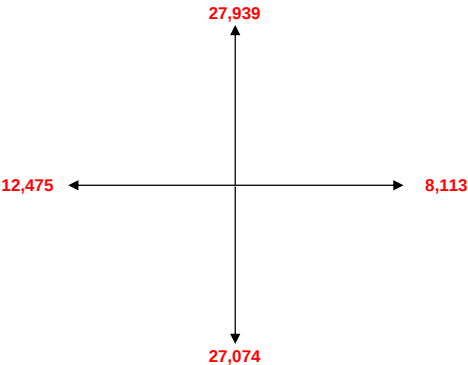
Year 2025 AM Peak Hour Turning Movement Calculations w/o Project

Adams Avenue and Eastbound 91 Ramps

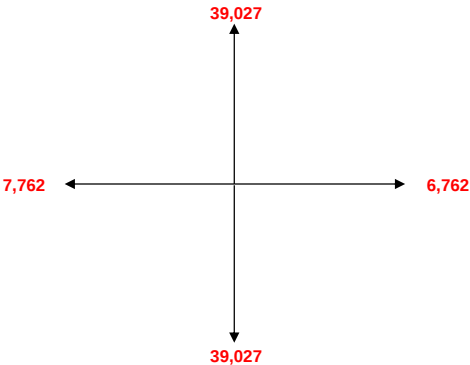
Existing Peak Hour Turning Movement Volumes (AM)



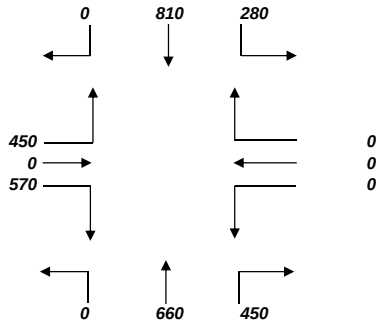
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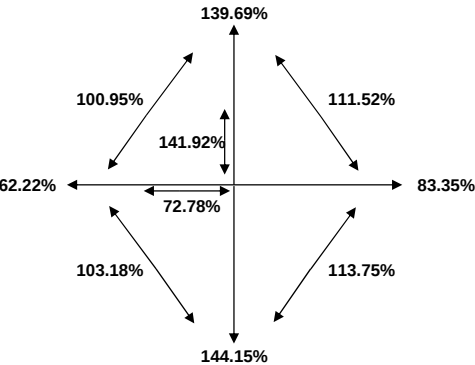
2025 ADTs



2025 Peak Hour Turning Movement Volumes (Calculated)



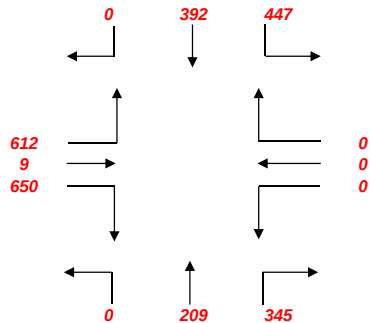
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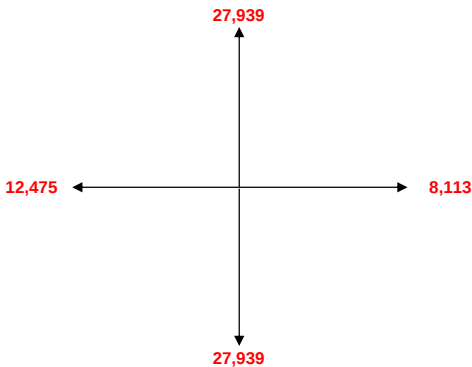
Year 2025 PM Peak Hour Turning Movement Calculations w/o Project

Adams Avenue and Eastbound 91 Ramps

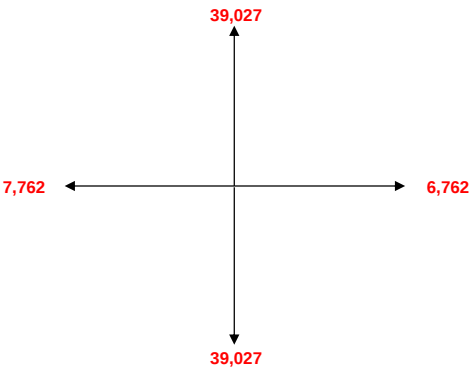
Existing Peak Hour Turning Movement Volumes (PM)



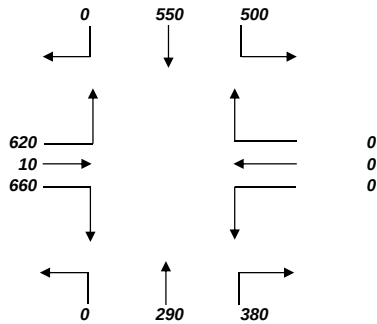
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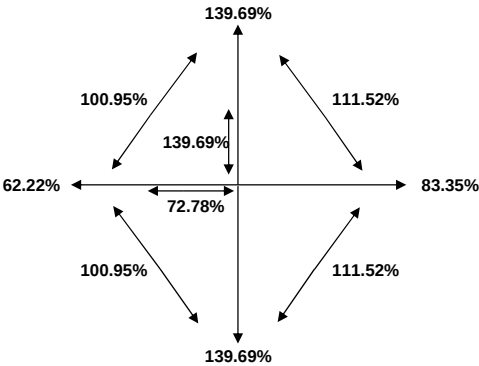
2025 ADTs



2025 Peak Hour Turning Movement Volumes (PM-Calculated)



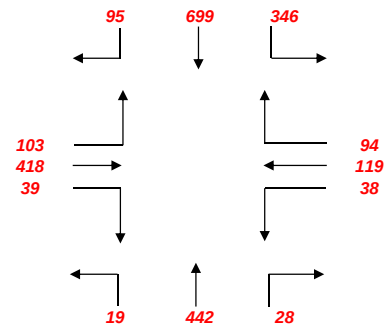
percent increase/decrease



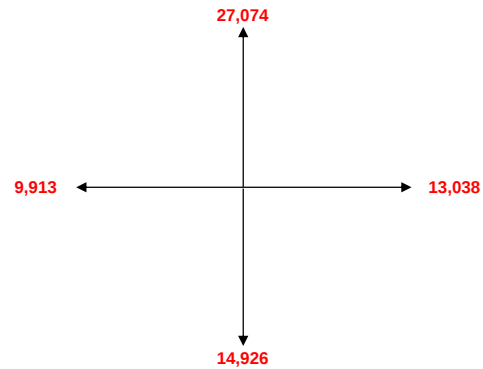
Year 2025 AM Peak Hour Turning Movement Calculations w/o Project

Adams Street and Indiana Avenue

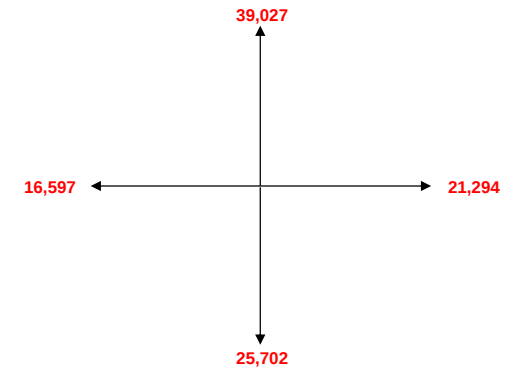
Existing Peak Hour Turning Movement Volumes (AM)



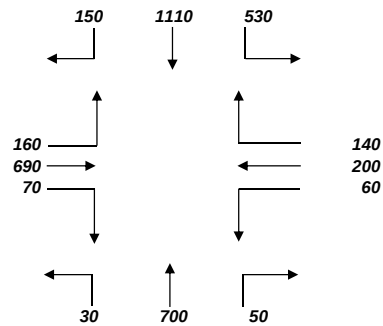
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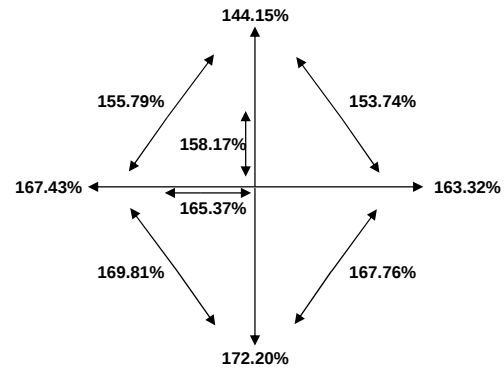
2025 ADTs



2025 Peak Hour Turning Movement Volumes (Calculated)



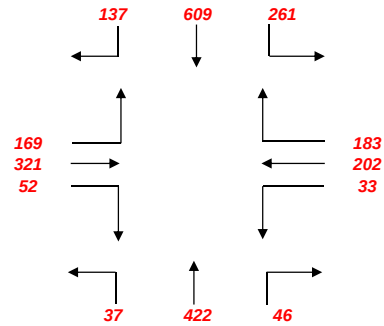
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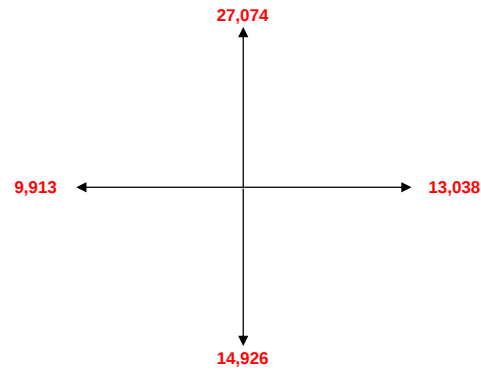
Year 2025 PM Peak Hour Turning Movement Calculations w/o Project

Adams Street and Indiana Avenue

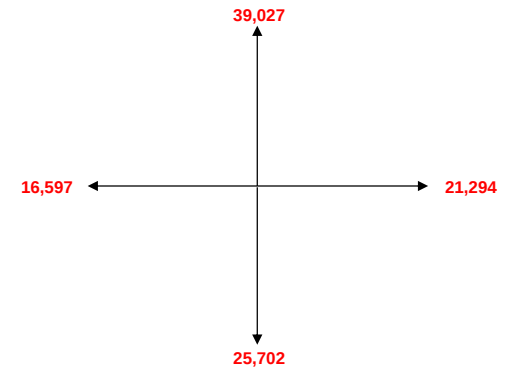
Existing Peak Hour Turning Movement Volumes (PM)



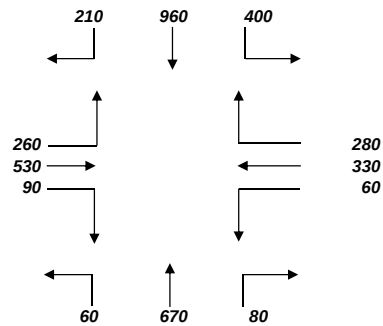
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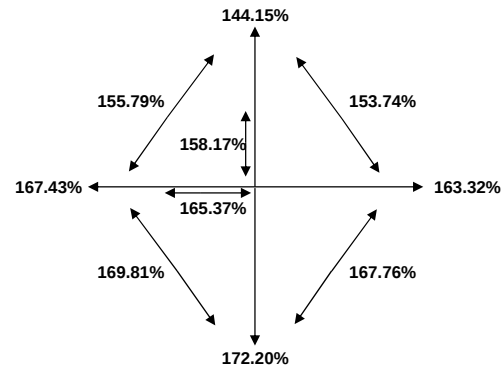
2025 ADTs



2025 Peak Hour Turning Movement Volumes (PM-Calculated)



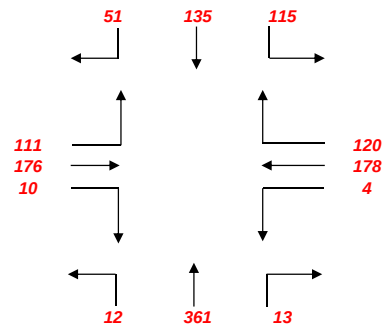
percent increase/decrease



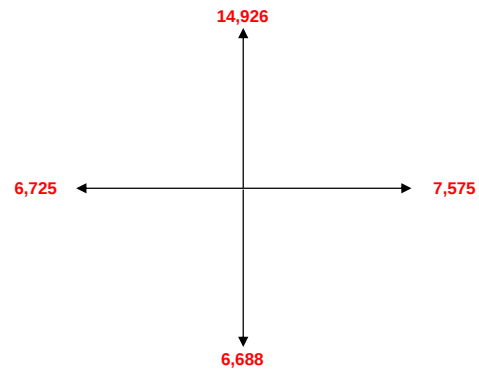
Year 2025 AM Peak Hour Turning Movement Calculations w/o Project

Adams Street and Lincoln Avenue

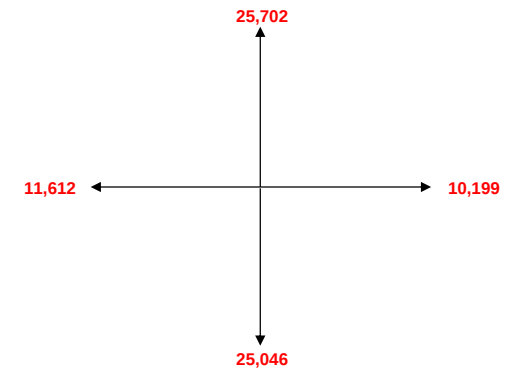
Existing Peak Hour Turning Movement Volumes (AM)



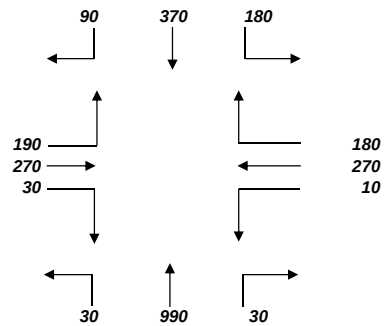
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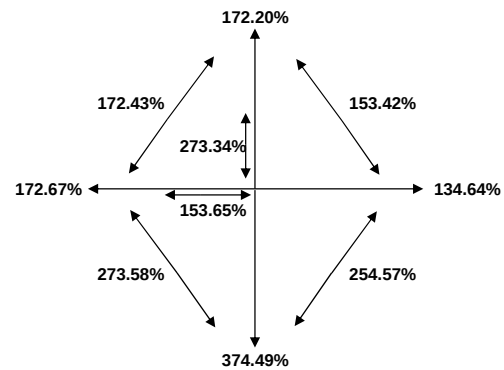
2025 ADTs



2025 Peak Hour Turning Movement Volumes (Calculated)



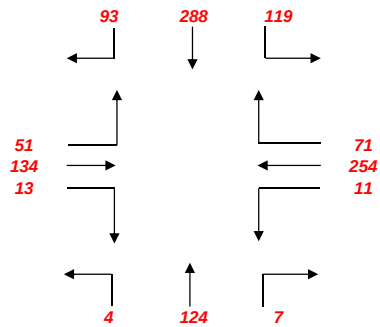
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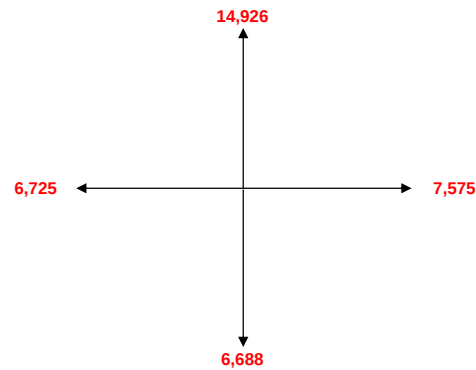
Year 2025 PM Peak Hour Turning Movement Calculations w/o Project

Adams Street and Lincoln Avenue

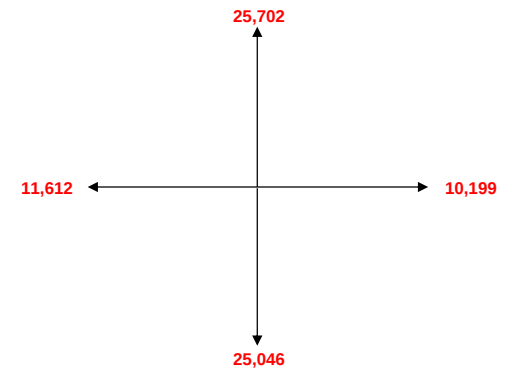
Existing Peak Hour Turning Movement Volumes (PM)



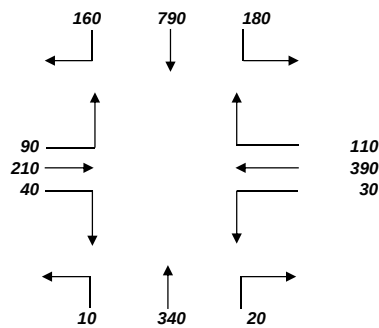
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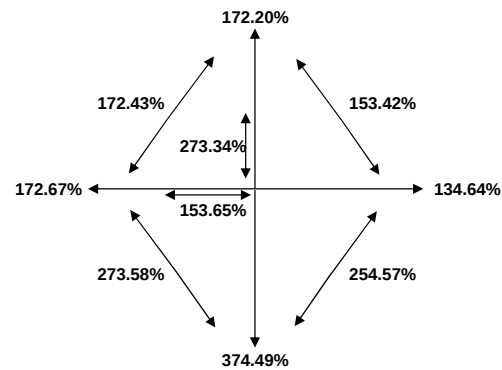
2025 ADTs



2025 Peak Hour Turning Movement Volumes (PM-Calculated)



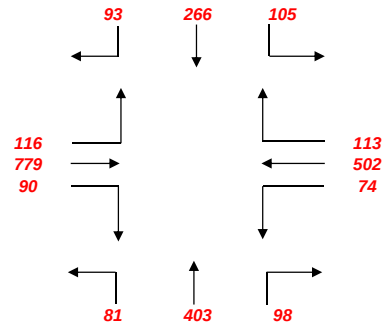
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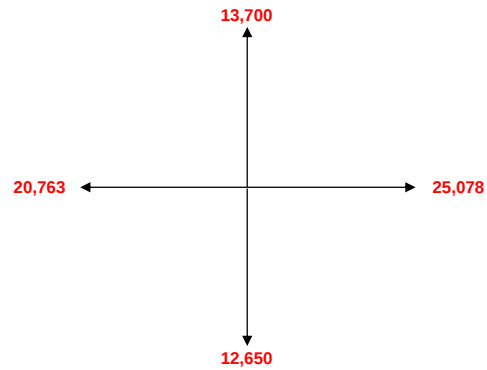
Year 2025 AM Peak Hour Turning Movement Calculations w/o Project

Jackson Street and Magnolia Avenue

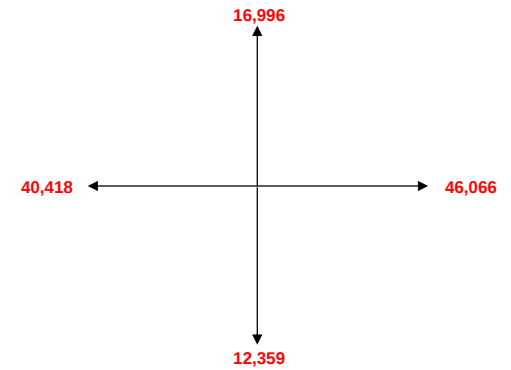
Existing Peak Hour Turning Movement Volumes (AM)



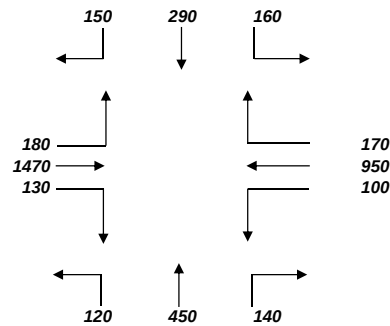
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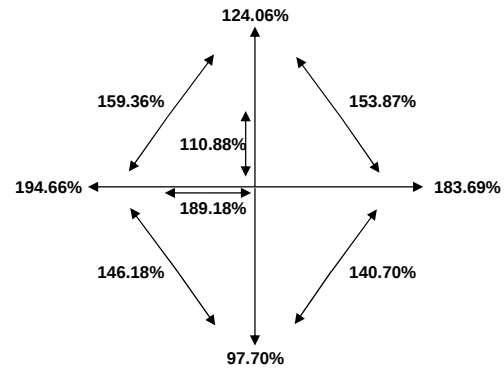
2025 ADTs



2025 Peak Hour Turning Movement Volumes (Calculated)



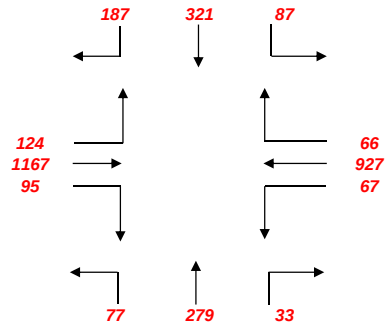
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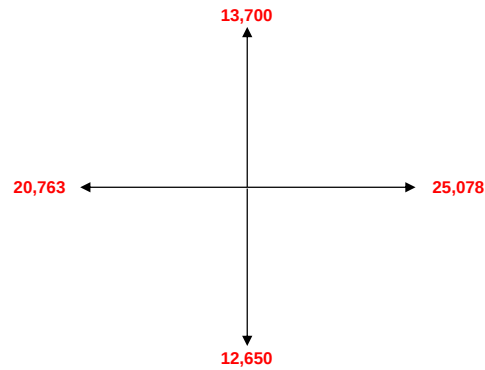
Year 2025 PM Peak Hour Turning Movement Calculations w/o Project

Jackson Street and Magnolia Avenue

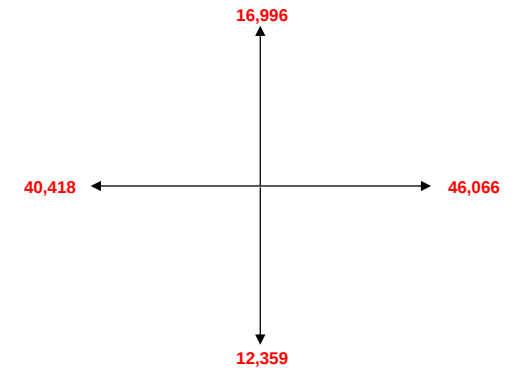
Existing Peak Hour Turning Movement Volumes (PM)



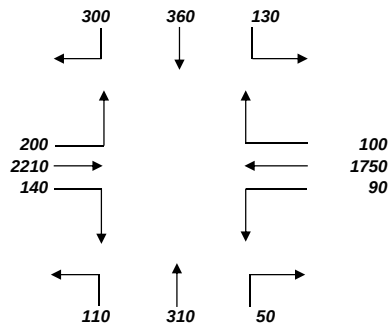
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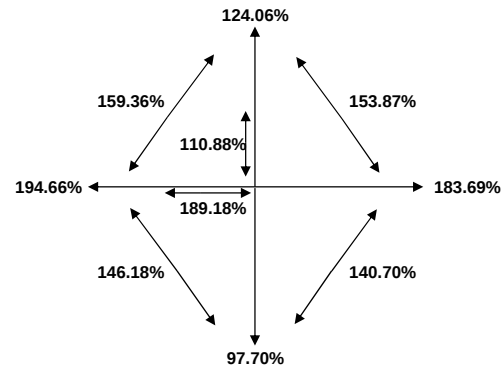
2025 ADTs



2025 Peak Hour Turning Movement Volumes (PM-Calculated)



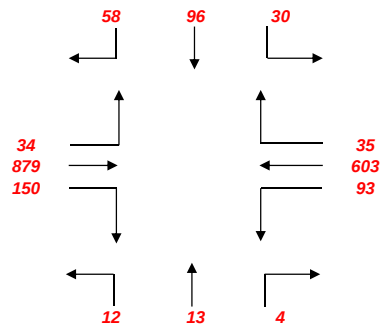
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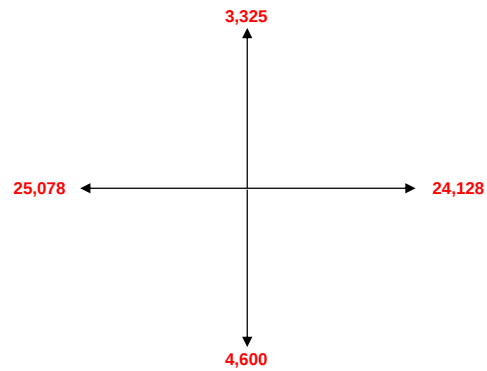
Year 2025 AM Peak Hour Turning Movement Calculations w/o Project

Magnolia Avenue and Overland Street

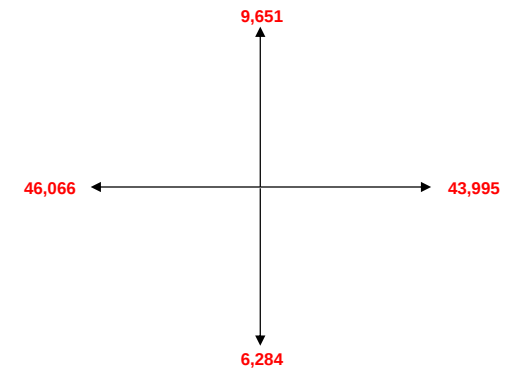
Existing Peak Hour Turning Movement Volumes (AM)



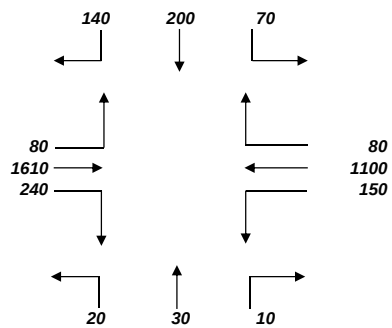
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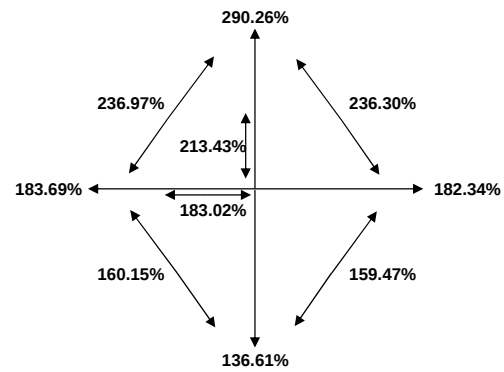
2025 ADTs



2025 Peak Hour Turning Movement Volumes (Calculated)



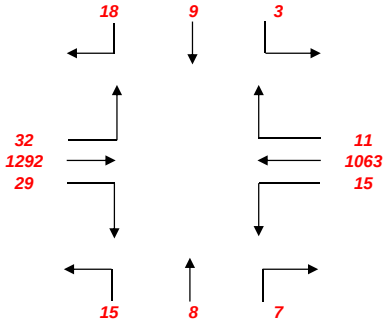
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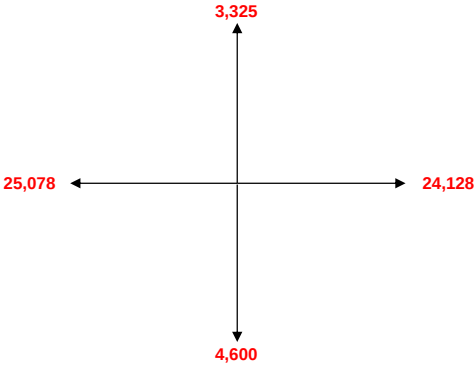
Year 2025 PM Peak Hour Turning Movement Calculations w/o Project

Magnolia Avenue and Overland Street

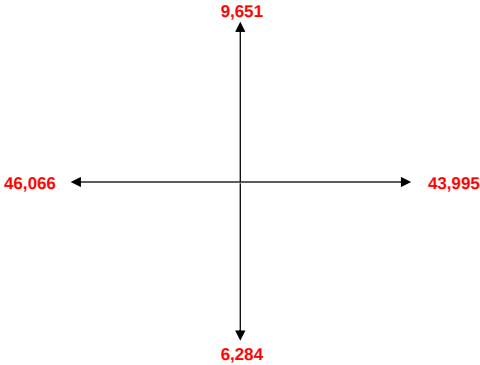
Existing Peak Hour Turning Movement Volumes (PM)



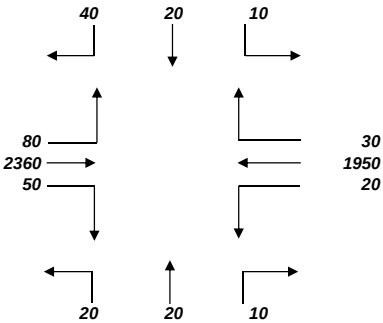
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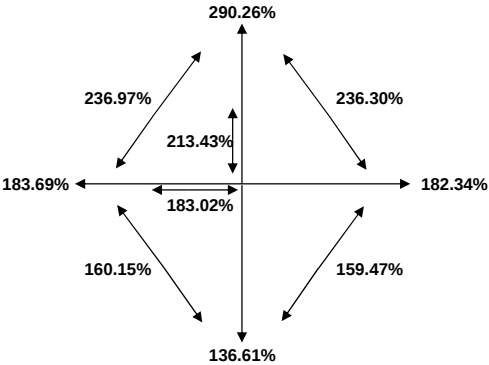
2025 ADTs



2025 Peak Hour Turning Movement Volumes (PM-Calculated)



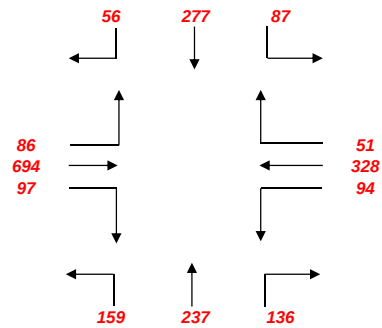
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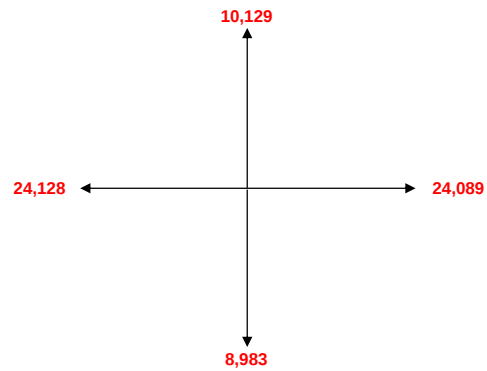
Year 2025 AM Peak Hour Turning Movement Calculations w/o Project

Monroe Street and Magnolia Avenue

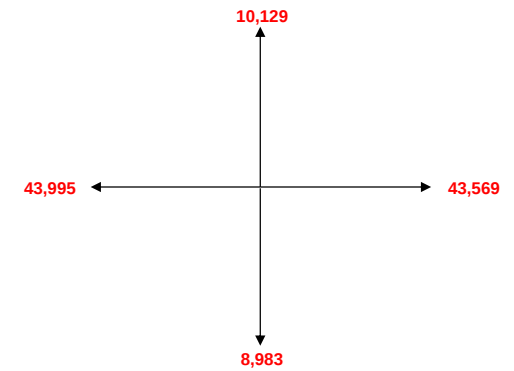
Existing Peak Hour Turning Movement Volumes (AM)



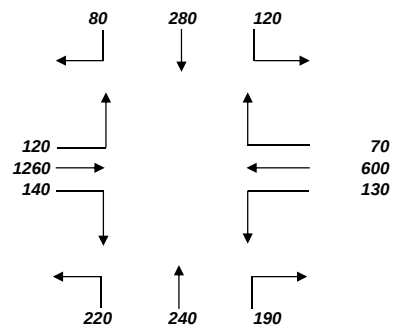
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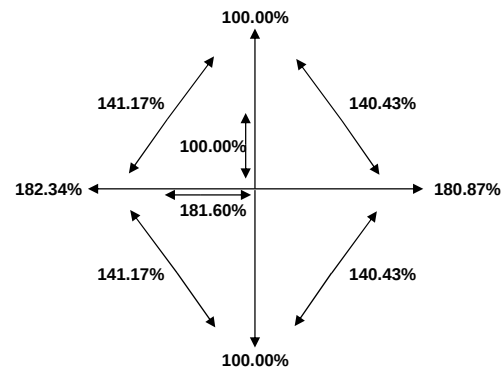
2025 ADTs



2025 Peak Hour Turning Movement Volumes (Calculated)



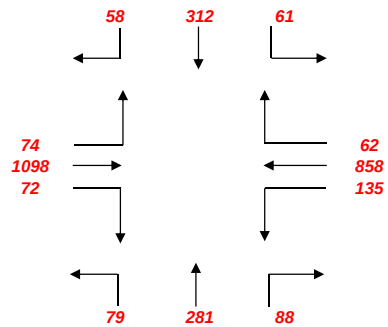
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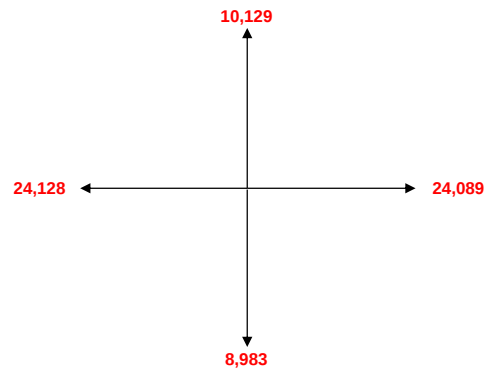
Year 2025 PM Peak Hour Turning Movement Calculations w/o Project

Monroe Street and Magnolia Avenue

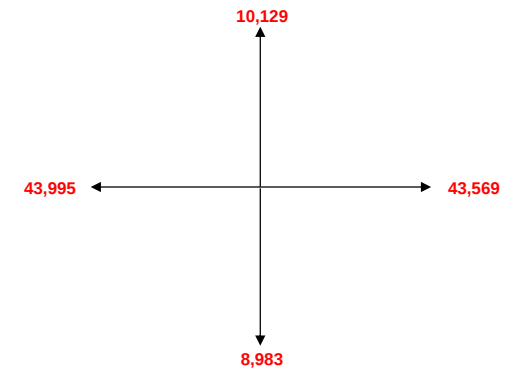
Existing Peak Hour Turning Movement Volumes (PM)



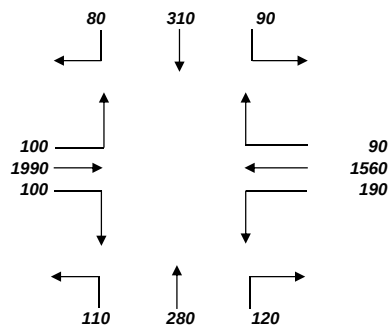
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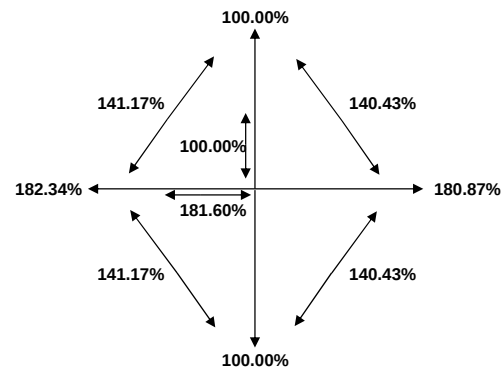
2025 ADTs



2025 Peak Hour Turning Movement Volumes (PM-Calculated)



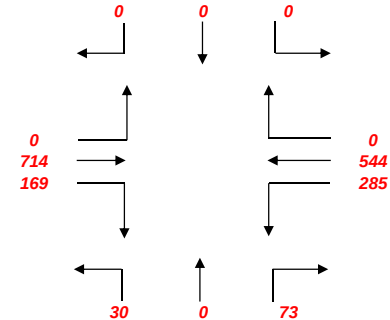
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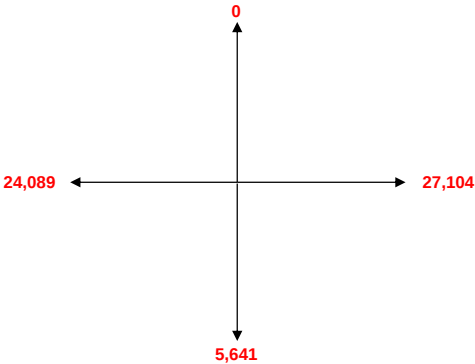
Year 2025 AM Peak Hour Turning Movement Calculations w/o Project

Campus Bridge Drive and Magnolia Avenue

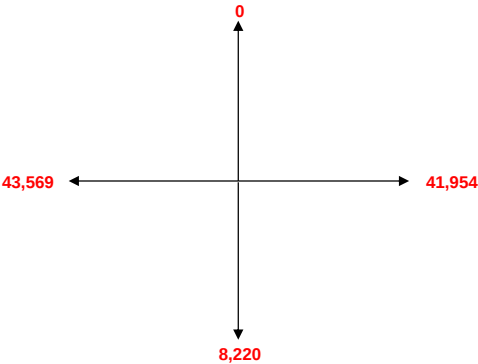
Existing Peak Hour Turning Movement Volumes (AM)



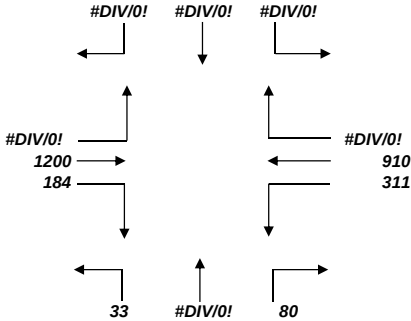
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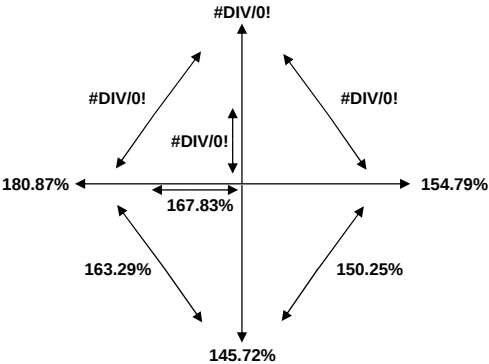
2025 ADTs



2025 Peak Hour Turning Movement Volumes (Calculated)



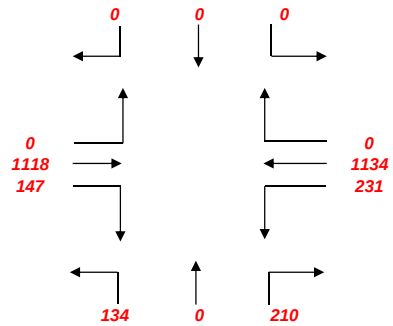
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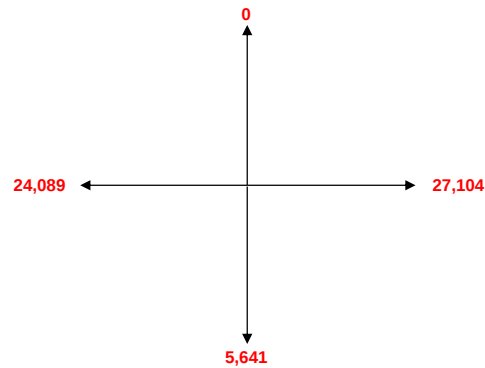
Year 2025 PM Peak Hour Turning Movement Calculations w/o Project

Campus Bridge Drive and Magnolia Avenue

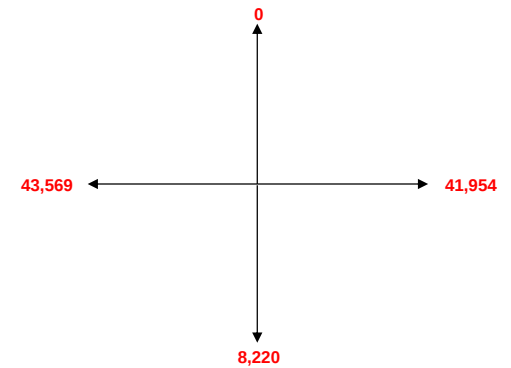
Existing Peak Hour Turning Movement Volumes (PM)



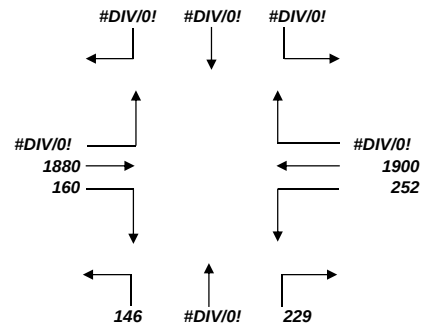
Existing ADTs



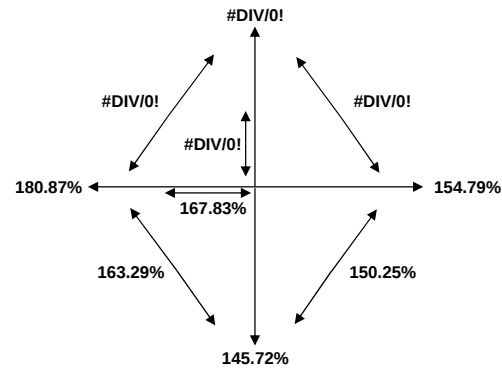
2025 ADTs



2025 Peak Hour Turning Movement Volumes (PM-Calculated)



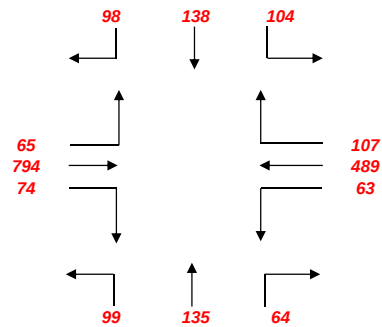
percent increase/decrease



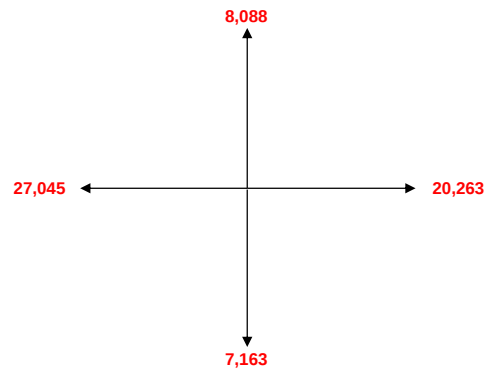
Year 2025 AM Peak Hour Turning Movement Calculations w/o Project

Jefferson Street and Magnolia Avenue

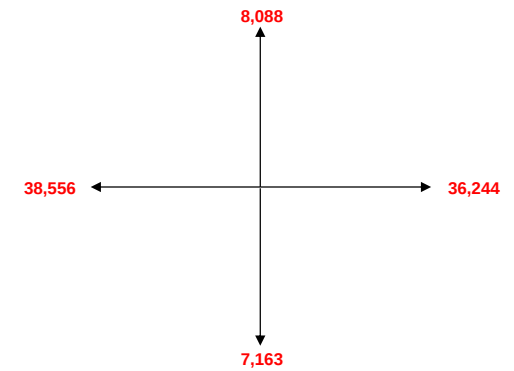
Existing Peak Hour Turning Movement Volumes (AM)



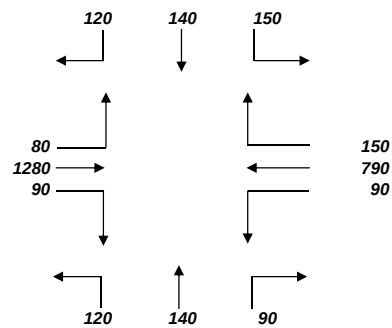
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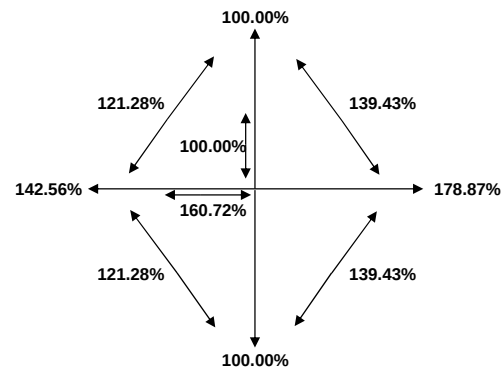
2025 ADTs



2025 Peak Hour Turning Movement Volumes (Calculated)



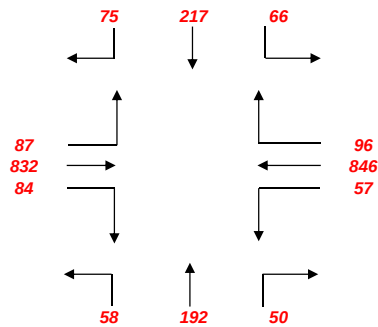
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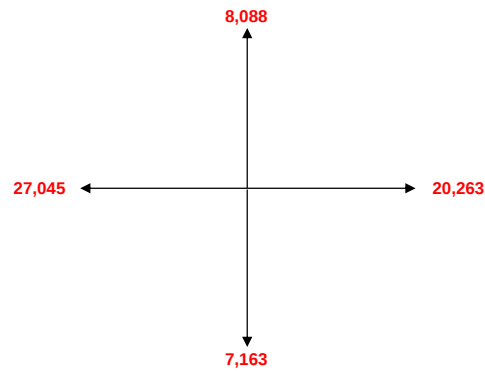
Year 2025 PM Peak Hour Turning Movement Calculations w/o Project

Jefferson Street and Magnolia Avenue

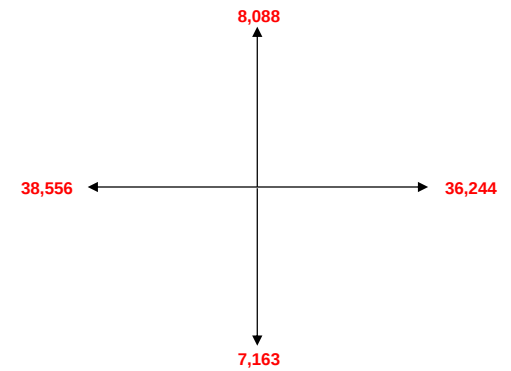
Existing Peak Hour Turning Movement Volumes (PM)



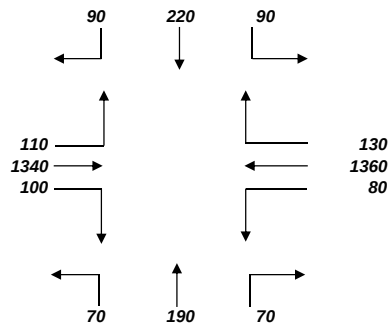
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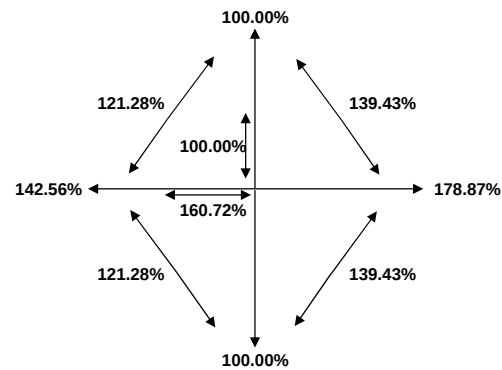
2025 ADTs



2025 Peak Hour Turning Movement Volumes (PM-Calculated)



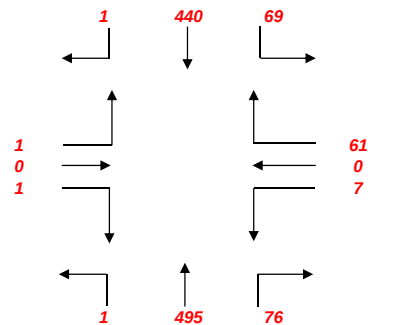
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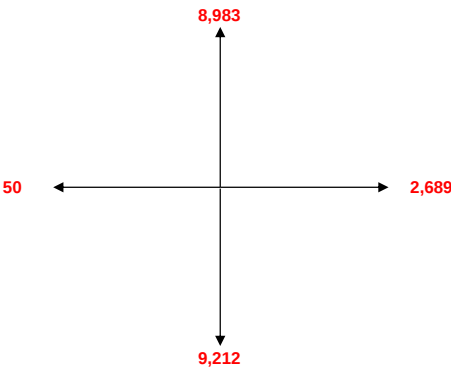
Year 2025 AM Peak Hour Turning Movement Calculations w/o Project

Diana Avenue and Monroe Street

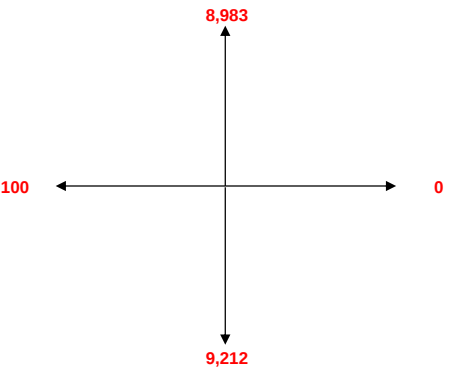
Existing Peak Hour Turning Movement Volumes (AM)



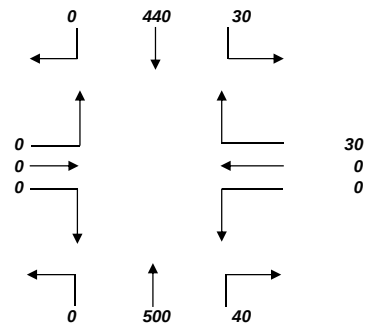
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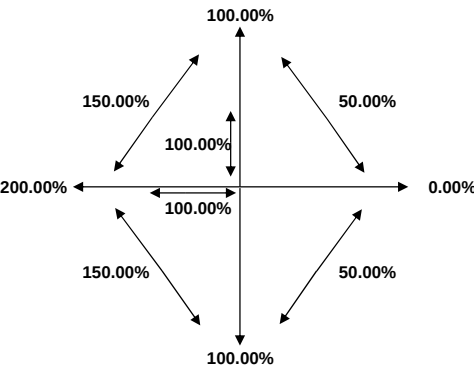
2025 ADTs



2025 Peak Hour Turning Movement Volumes (Calculated)



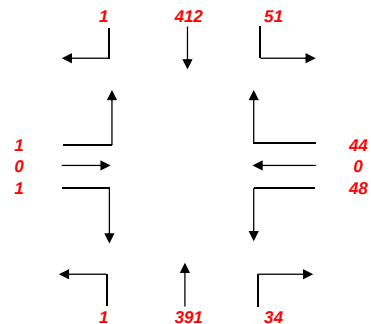
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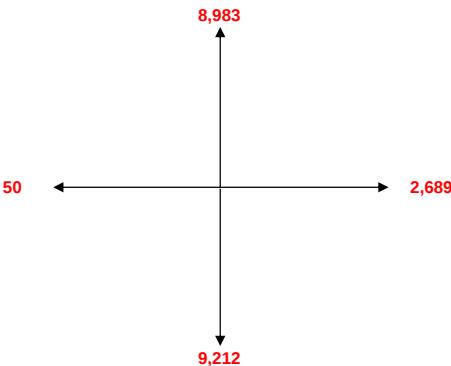
Year 2025 PM Peak Hour Turning Movement Calculations w/o Project

Diana Avenue and Monroe Street

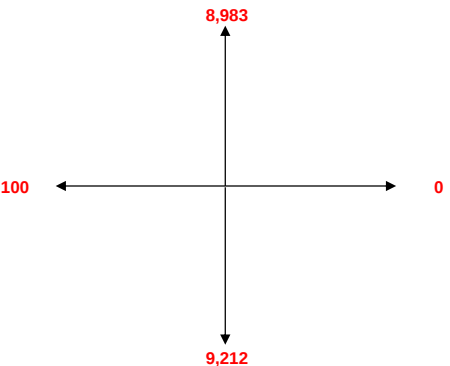
Existing Peak Hour Turning Movement Volumes (PM)



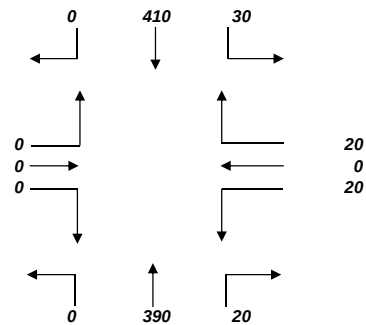
Existing ADTs



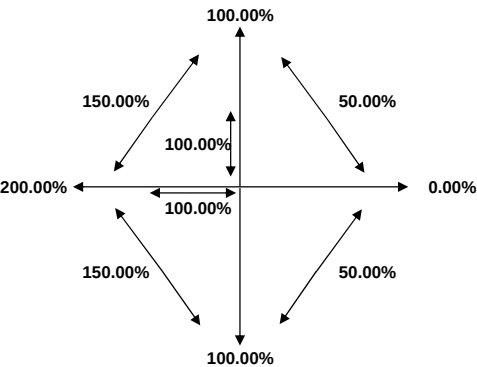
2025 ADTs



2025 Peak Hour Turning Movement Volumes (PM-Calculated)



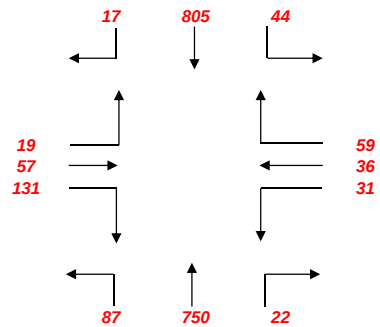
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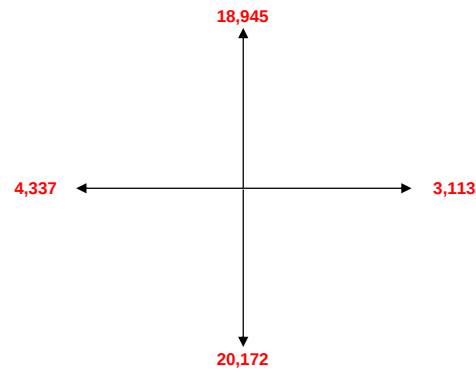
Year 2025 AM Peak Hour Turning Movement Calculations w/ Project

Adams Street and Garfield Street

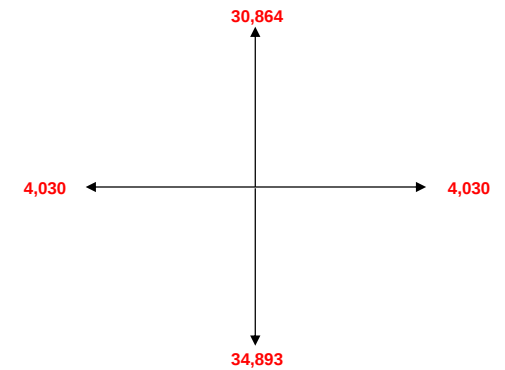
Existing Peak Hour Turning Movement Volumes (AM)



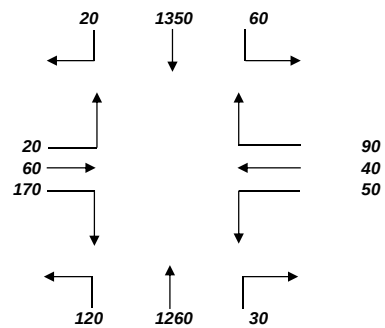
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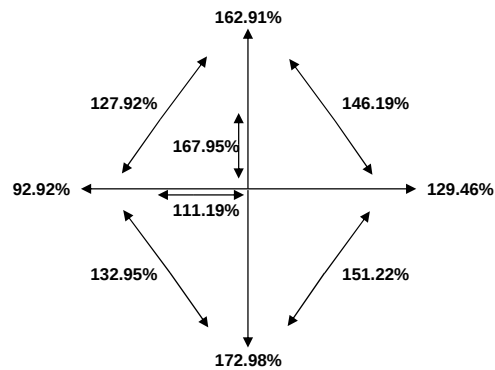
2025 ADTs



2025 Peak Hour Turning Movement Volumes (Calculated)



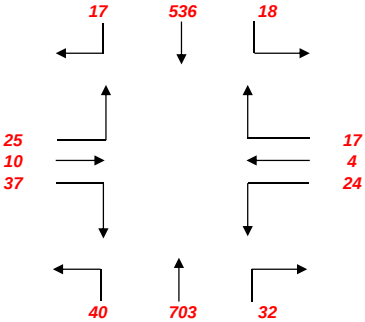
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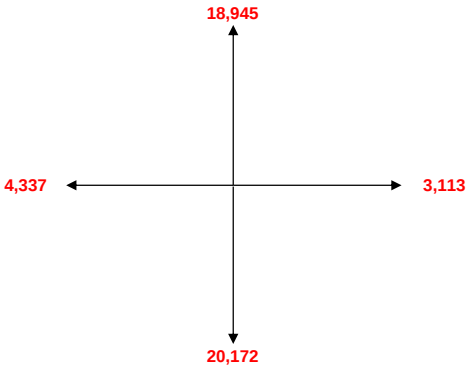
Year 2025 PM Peak Hour Turning Movement Calculations w/ Project

Adams Street and Garfield Street

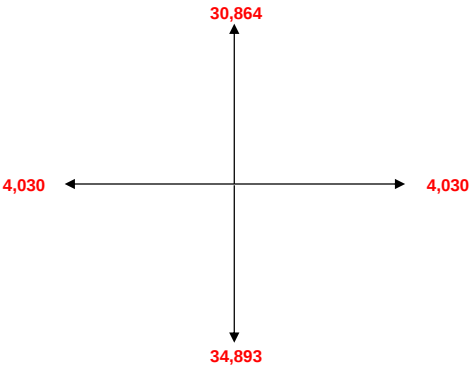
Existing Peak Hour Turning Movement Volumes (PM)



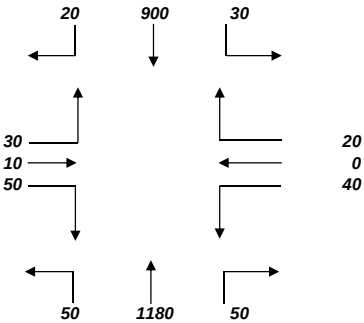
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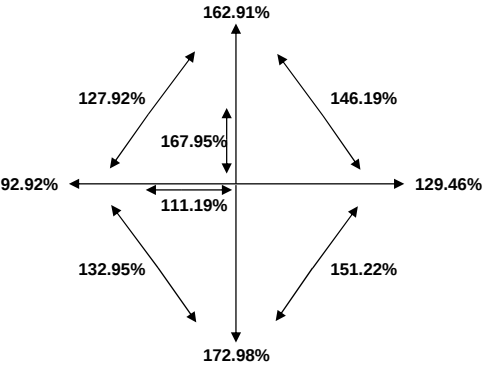
2025 ADTs



2025 Peak Hour Turning Movement Volumes (PM-Calculated)



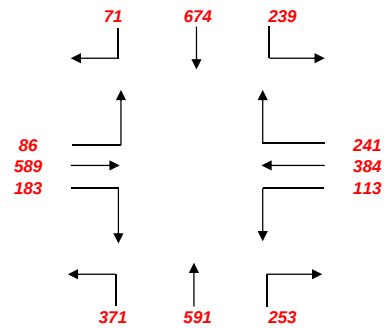
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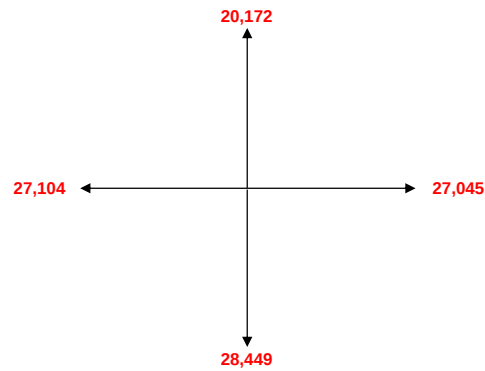
Year 2025 AM Peak Hour Turning Movement Calculations w/ Project

Adams Street and Magnolia Avenue

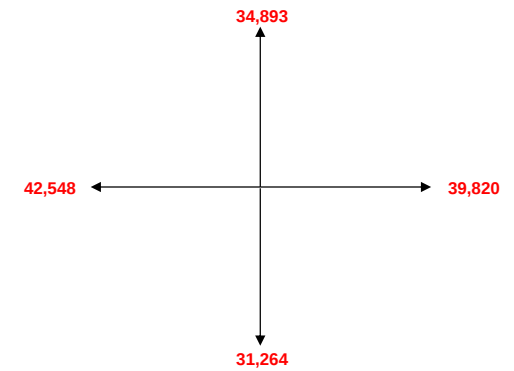
Existing Peak Hour Turning Movement Volumes (AM)



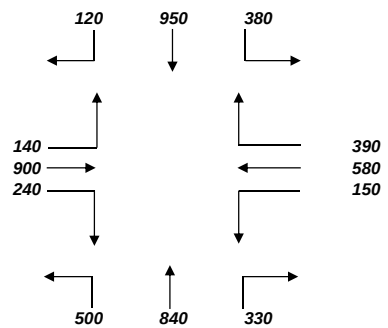
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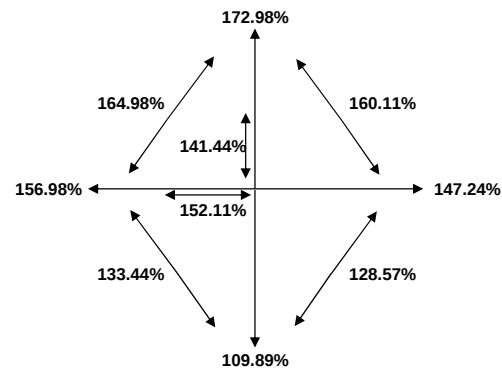
2025 ADTs



2025 Peak Hour Turning Movement Volumes (Calculated)



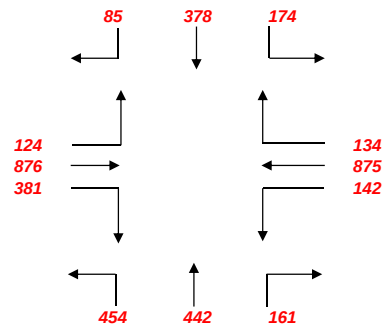
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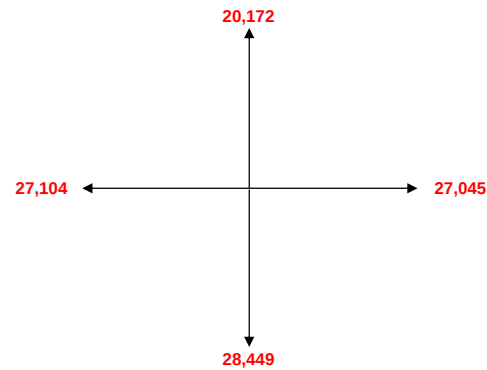
Year 2025 PM Peak Hour Turning Movement Calculations w/ Project

Adams Street and Magnolia Avenue

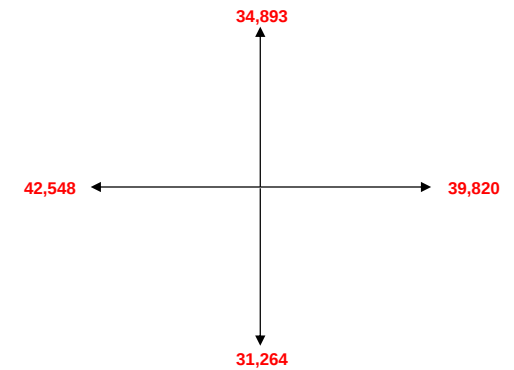
Existing Peak Hour Turning Movement Volumes (PM)



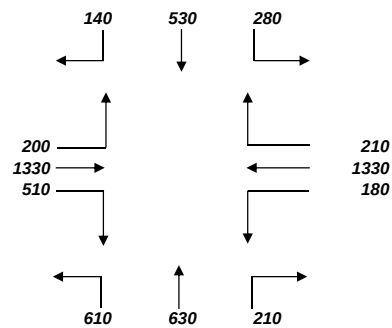
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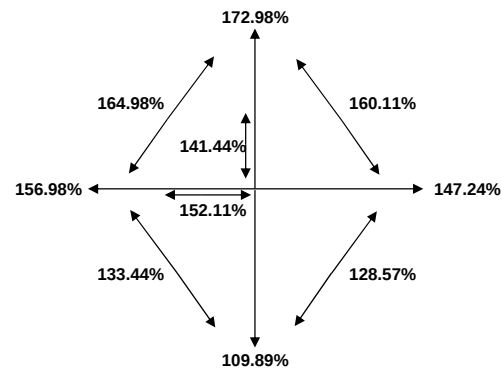
2025 ADTs



2025 Peak Hour Turning Movement Volumes (PM-Calculated)



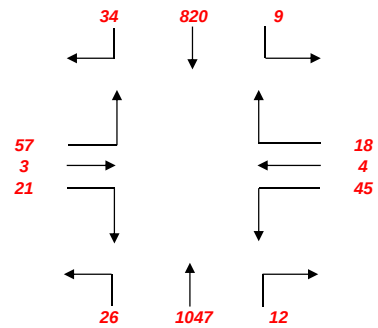
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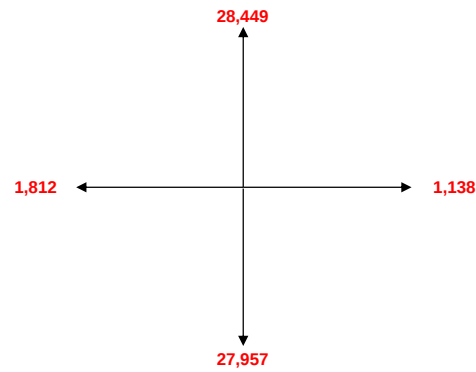
Year 2025 AM Peak Hour Turning Movement Calculations w/ Project

Adams Street and Lancer Lane/Briarwood Drive

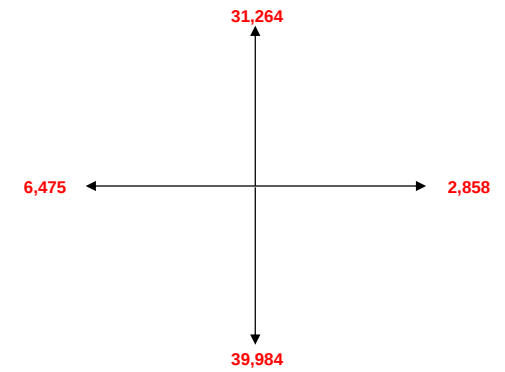
Existing Peak Hour Turning Movement Volumes (AM)



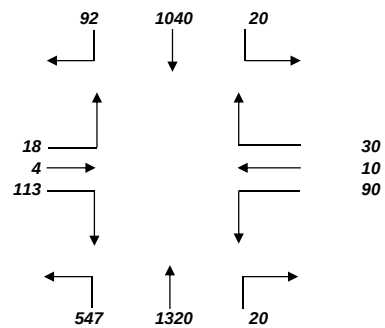
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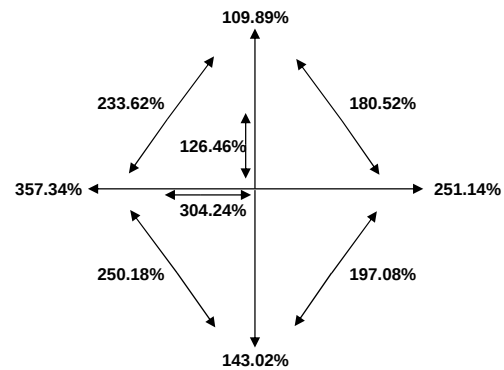
2025 ADTs



2025 Peak Hour Turning Movement Volumes (Calculated)



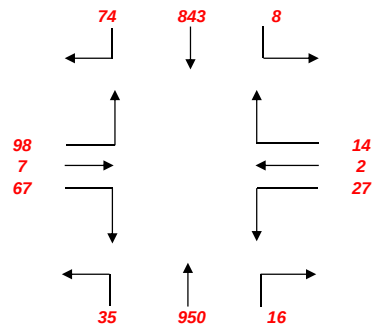
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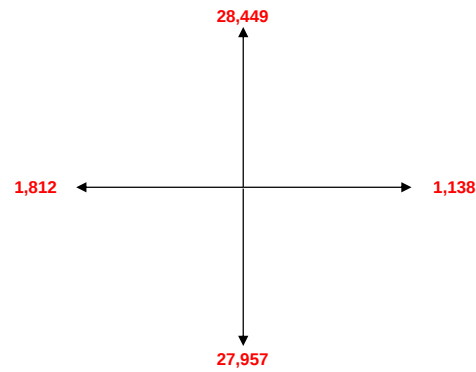
Year 2025 PM Peak Hour Turning Movement Calculations w/ Project

Adams Street and Lancer Lane/Briarwood Drive

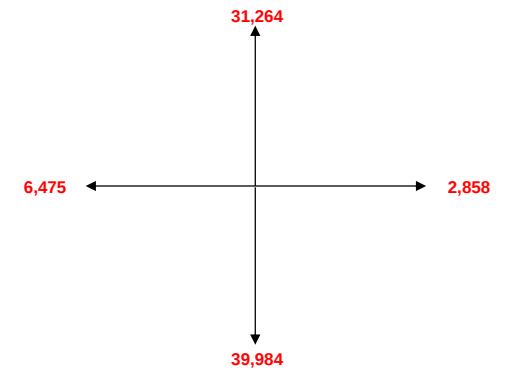
Existing Peak Hour Turning Movement Volumes (PM)



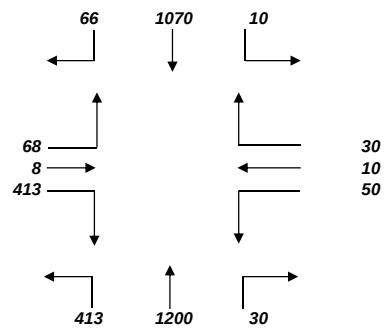
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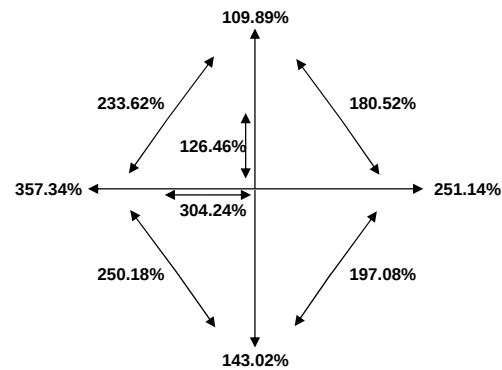
2025 ADTs



2025 Peak Hour Turning Movement Volumes (PM-Calculated)



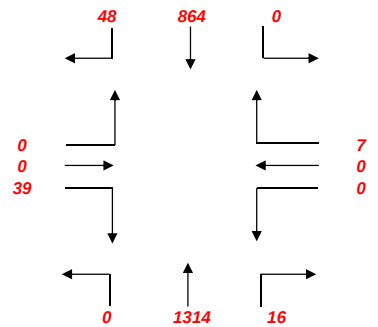
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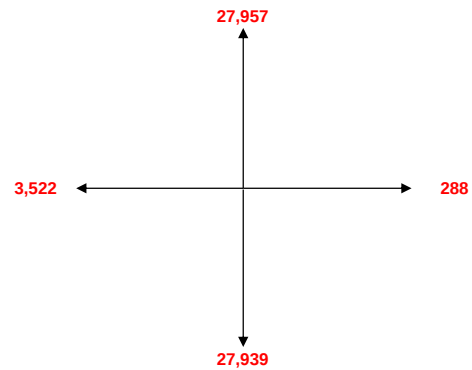
Year 2025 AM Peak Hour Turning Movement Calculations w/ Project

Diana Avenue and Adams Street

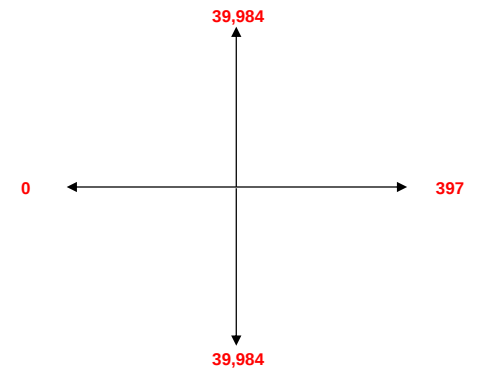
Existing Peak Hour Turning Movement Volumes (AM)



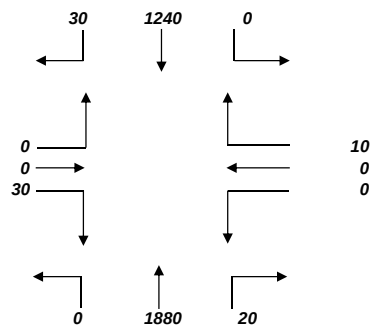
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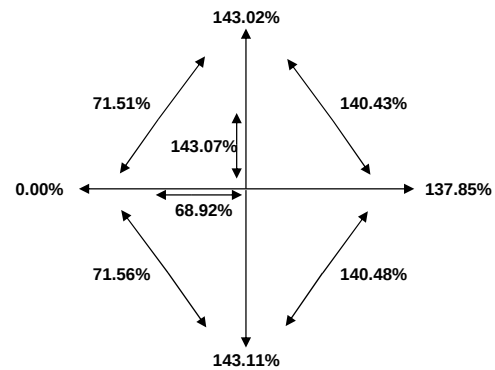
2025 ADTs



2025 Peak Hour Turning Movement Volumes (Calculated)



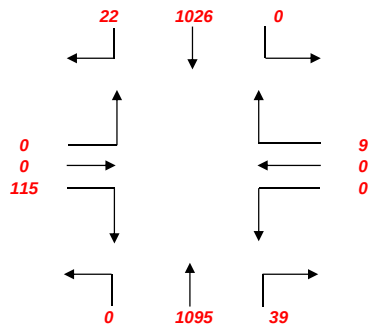
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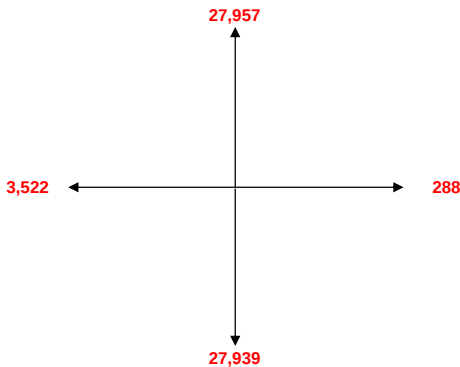
Year 2025 PM Peak Hour Turning Movement Calculations w/ Project

Diana Avenue and Adams Street

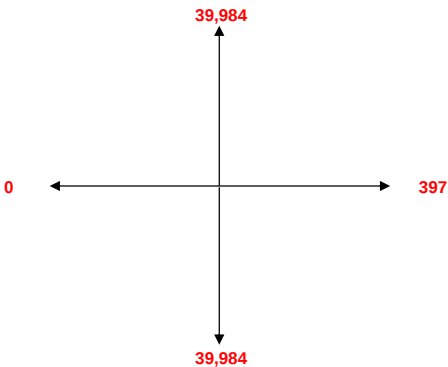
Existing Peak Hour Turning Movement Volumes (PM)



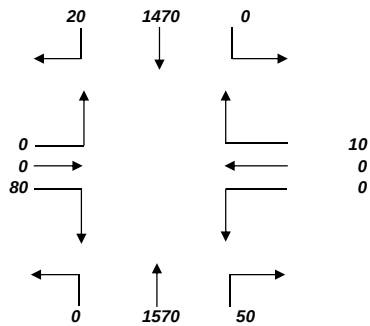
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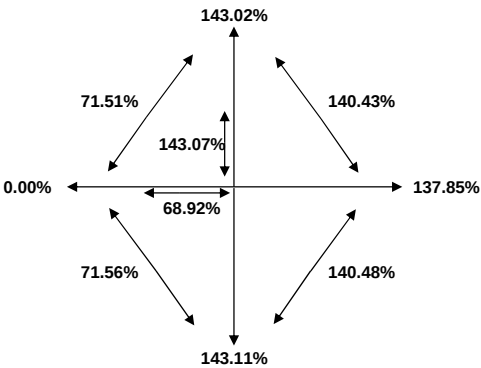
2025 ADTs



2025 Peak Hour Turning Movement Volumes (PM-Calculated)



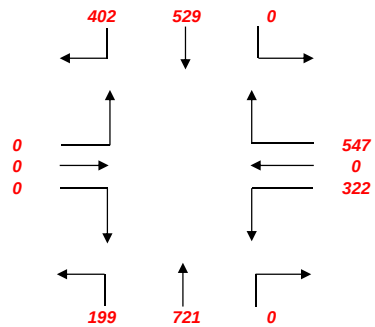
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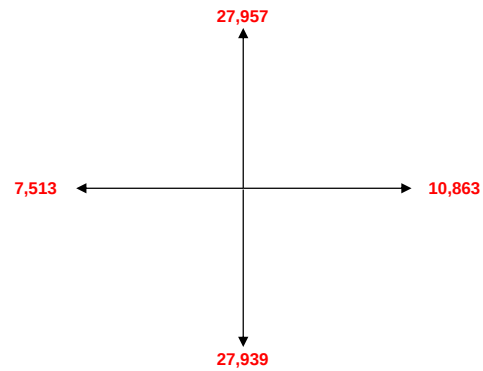
Year 2025 AM Peak Hour Turning Movement Calculations w/ Project

Adams Street and Westbound 91 Ramps

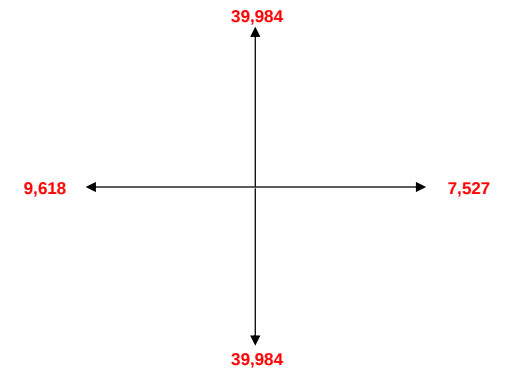
Existing Peak Hour Turning Movement Volumes (AM)



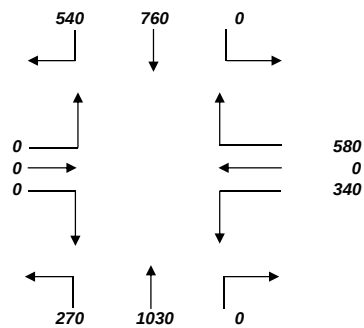
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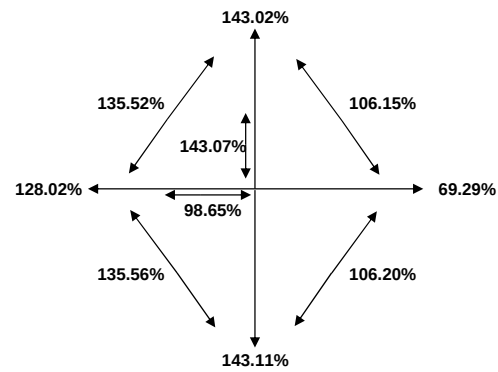
2025 ADTs



2025 Peak Hour Turning Movement Volumes (Calculated)



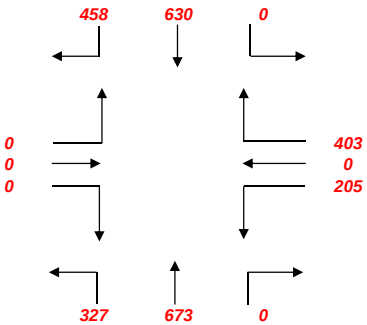
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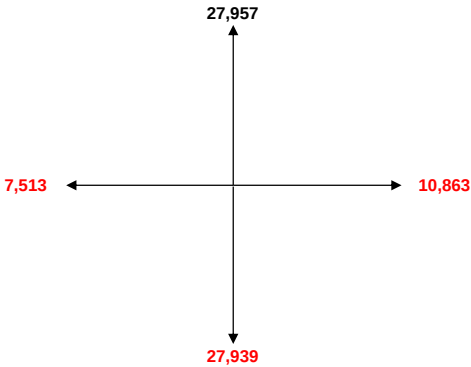
Year 2025 PM Peak Hour Turning Movement Calculations w/ Project

Adams Street and Westbound 91 Ramps

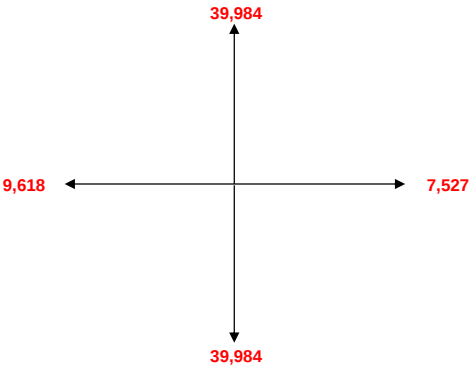
Existing Peak Hour Turning Movement Volumes (PM)



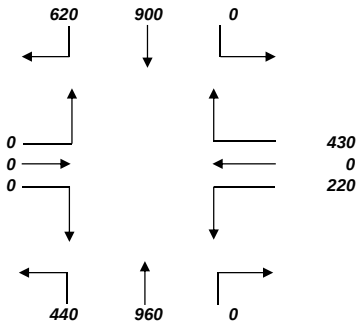
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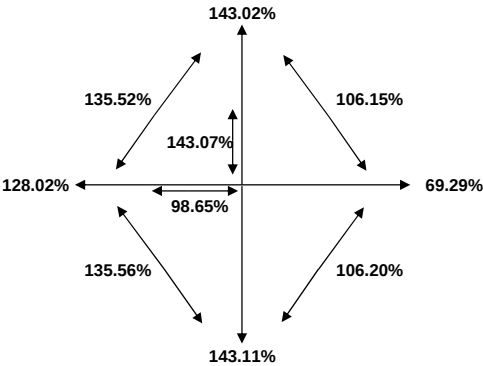
2025 ADTs



2025 Peak Hour Turning Movement Volumes (PM-Calculated)



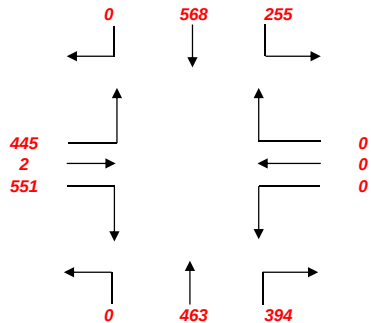
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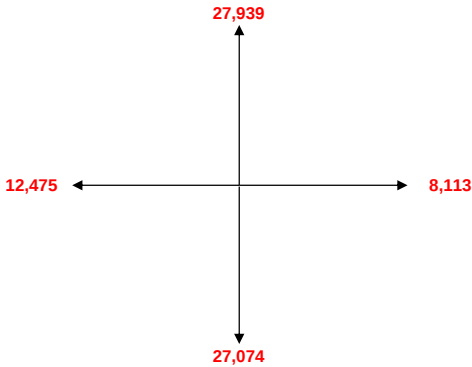
Year 2025 AM Peak Hour Turning Movement Calculations w/ Project

Adams Avenue and Eastbound 91 Ramps

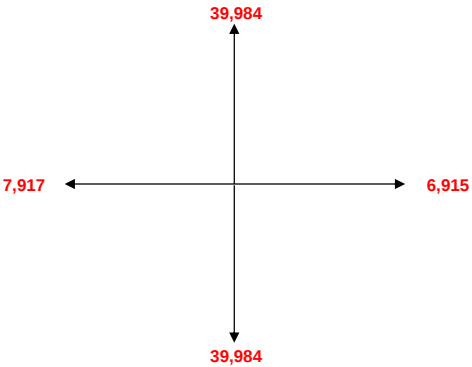
Existing Peak Hour Turning Movement Volumes (AM)



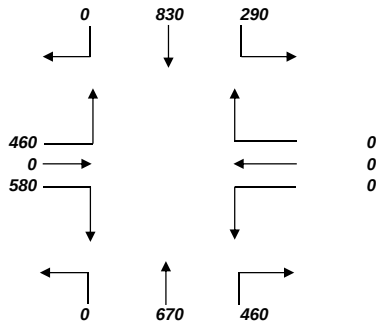
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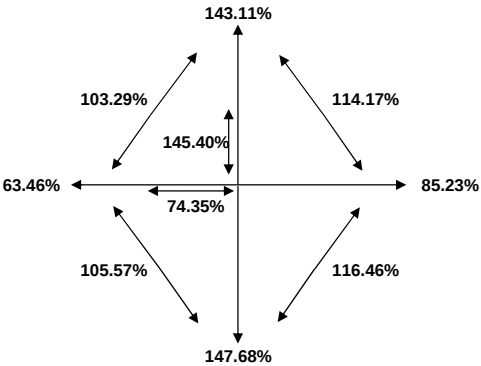
2025 ADTs



2025 Peak Hour Turning Movement Volumes (Calculated)



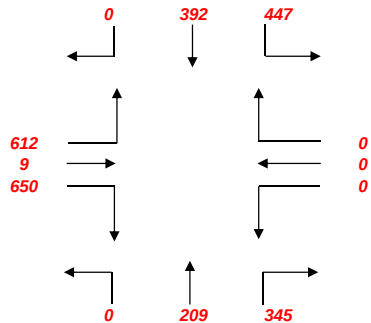
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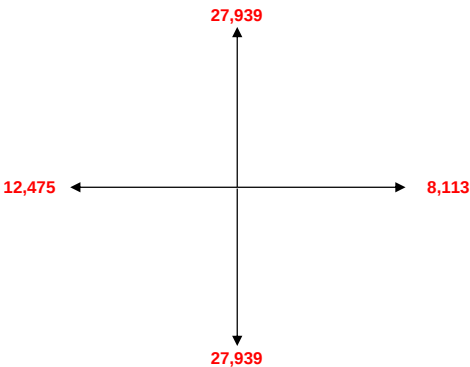
Year 2025 PM Peak Hour Turning Movement Calculations w/ Project

Adams Avenue and Eastbound 91 Ramps

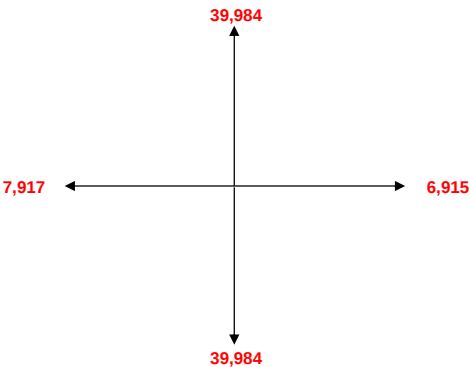
Existing Peak Hour Turning Movement Volumes (PM)



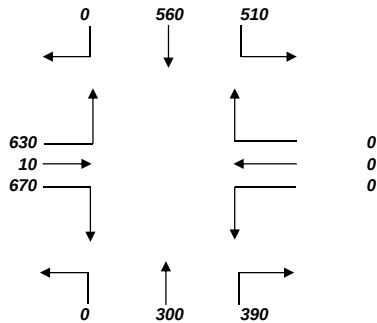
Existing ADTs



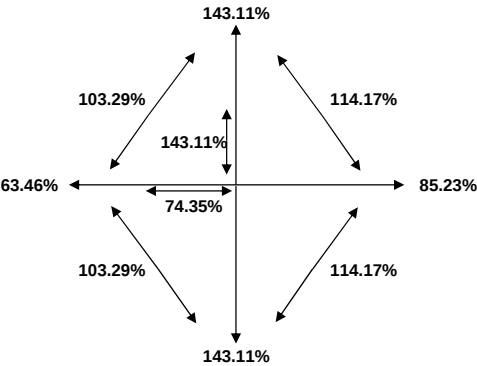
2025 ADTs



2025 Peak Hour Turning Movement Volumes (PM-Calculated)



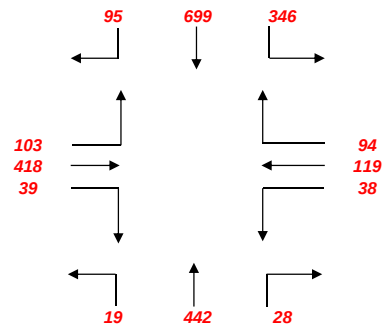
percent increase/decrease



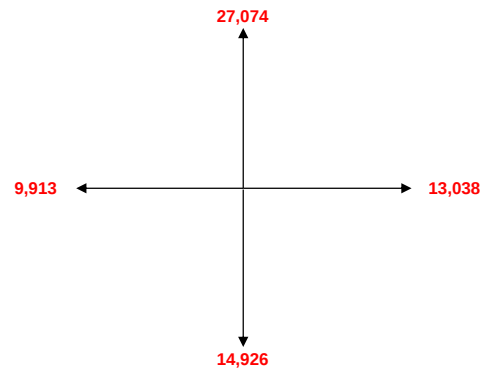
Year 2025 AM Peak Hour Turning Movement Calculations w/ Project

Adams Street and Indiana Avenue

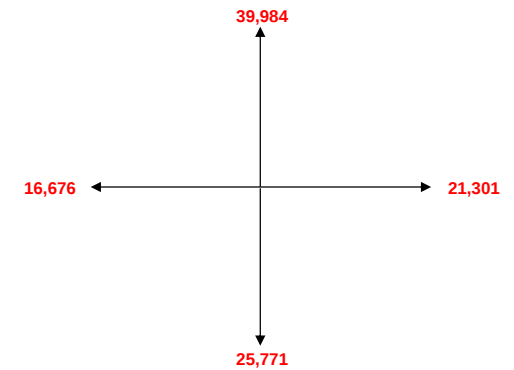
Existing Peak Hour Turning Movement Volumes (AM)



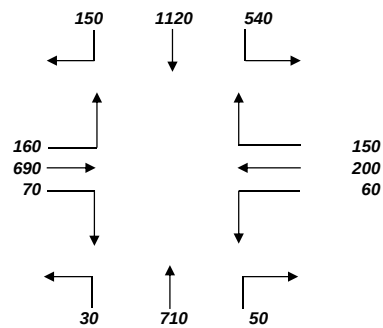
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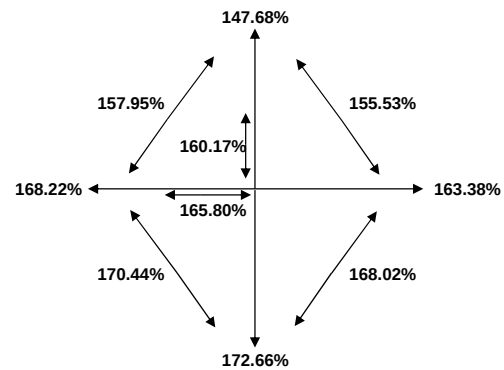
2025 ADTs



2025 Peak Hour Turning Movement Volumes (Calculated)



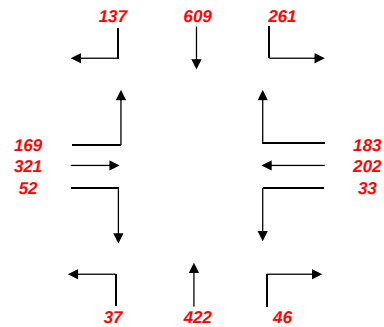
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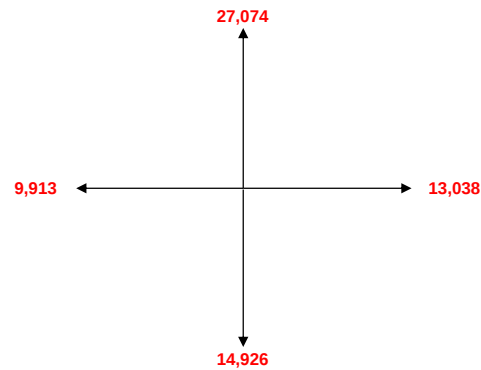
Year 2025 PM Peak Hour Turning Movement Calculations w/ Project

Adams Street and Indiana Avenue

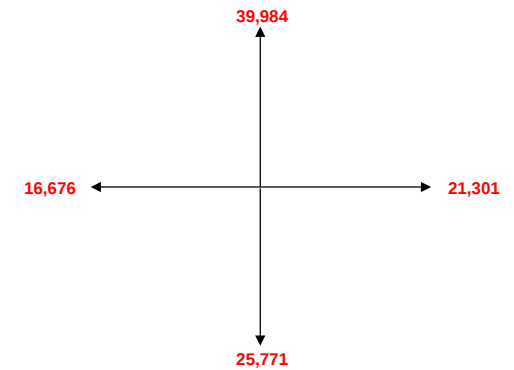
Existing Peak Hour Turning Movement Volumes (PM)



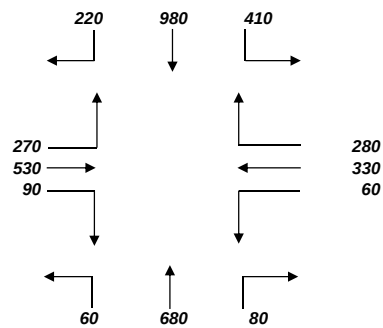
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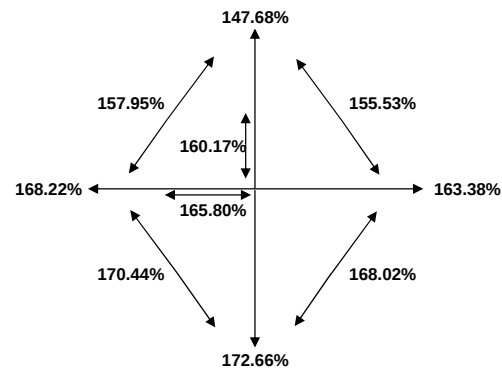
2025 ADTs



2025 Peak Hour Turning Movement Volumes (PM-Calculated)



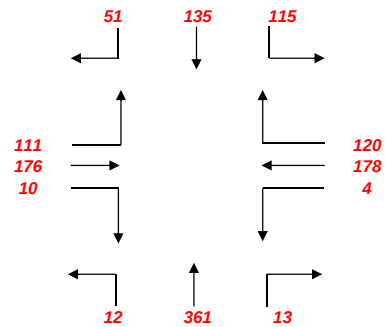
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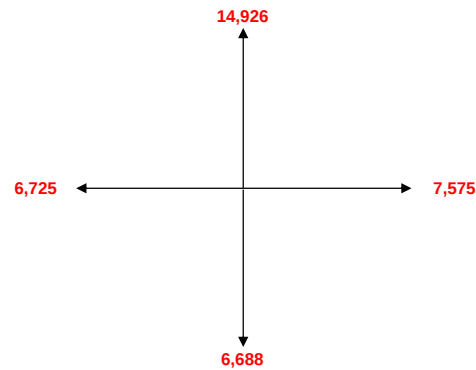
Year 2025 AM Peak Hour Turning Movement Calculations w/ Project

Adams Street and Lincoln Avenue

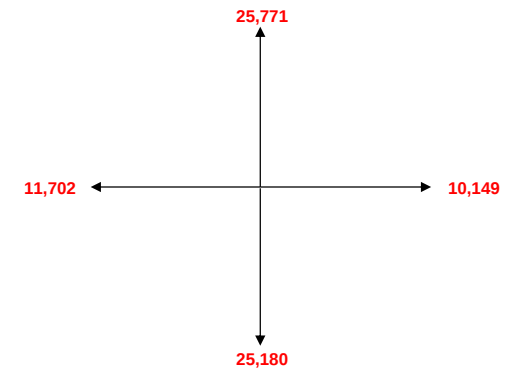
Existing Peak Hour Turning Movement Volumes (AM)



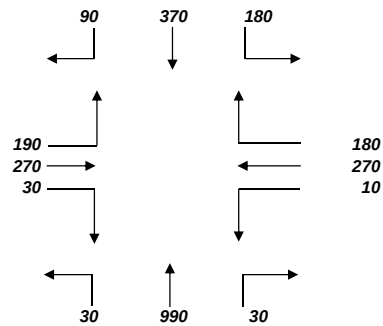
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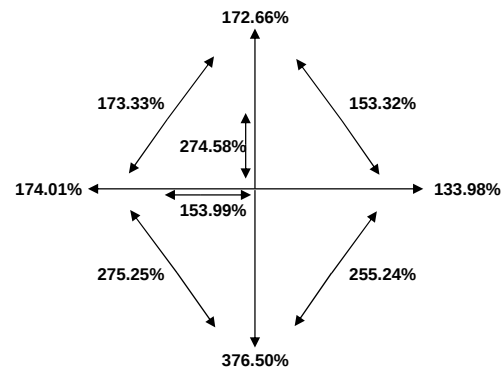
2025 ADTs



2025 Peak Hour Turning Movement Volumes (Calculated)



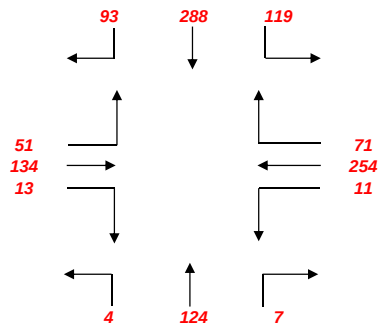
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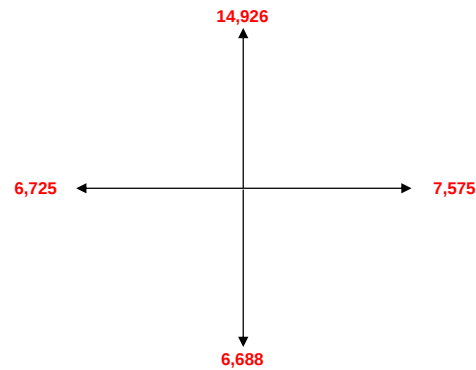
Year 2025 PM Peak Hour Turning Movement Calculations w/ Project

Adams Street and Lincoln Avenue

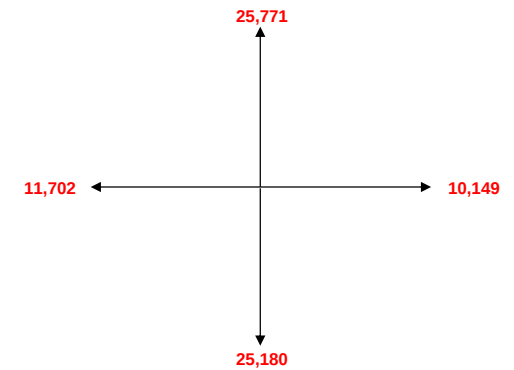
Existing Peak Hour Turning Movement Volumes (PM)



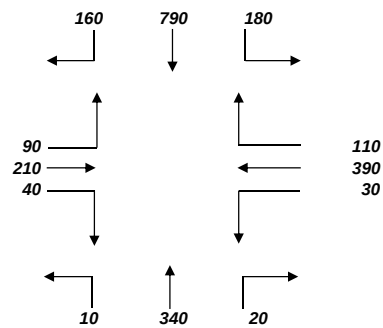
Existing ADTs



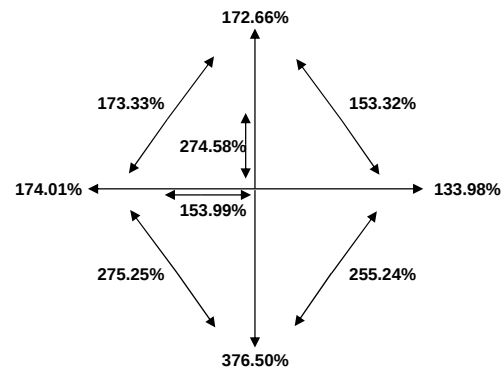
2025 ADTs



2025 Peak Hour Turning Movement Volumes (PM-Calculated)



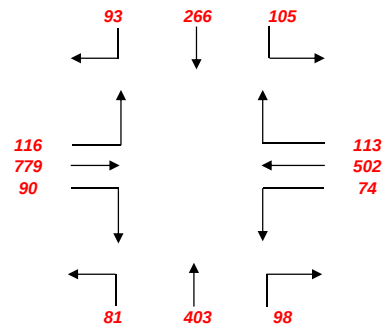
percent increase/decrease



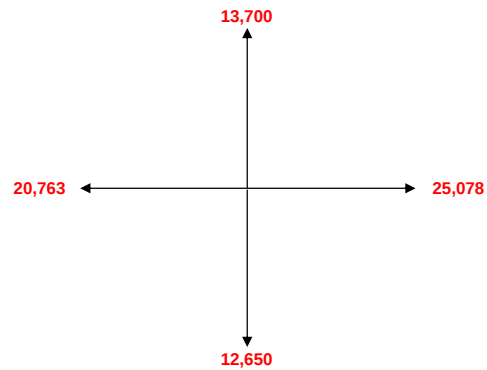
Year 2025 AM Peak Hour Turning Movement Calculations w/ Project

Jackson Street and Magnolia Avenue

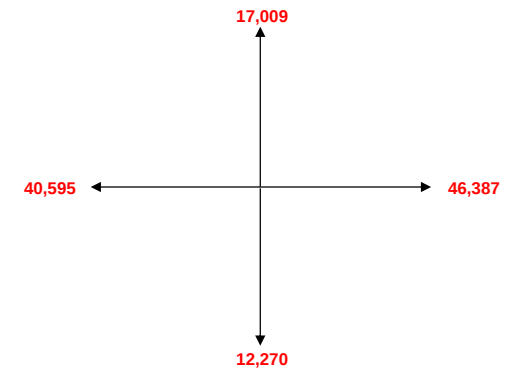
Existing Peak Hour Turning Movement Volumes (AM)



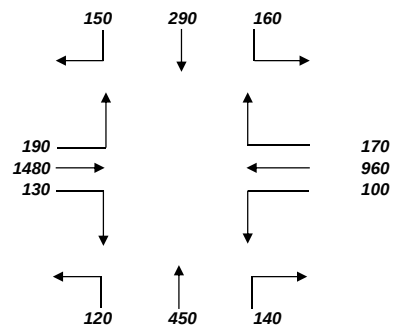
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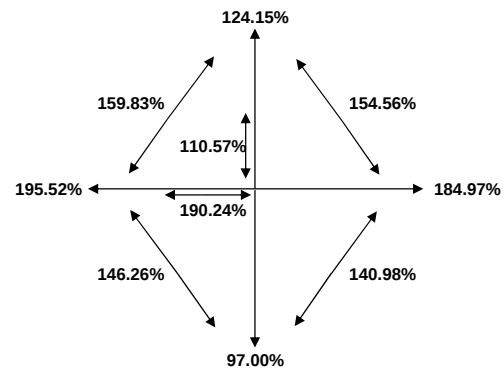
2025 ADTs



2025 Peak Hour Turning Movement Volumes (Calculated)



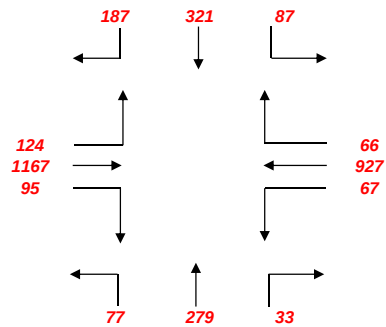
percent increase/decrease



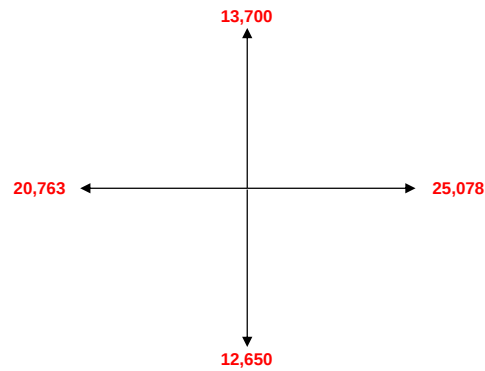
Year 2025 PM Peak Hour Turning Movement Calculations w/ Project

Jackson Street and Magnolia Avenue

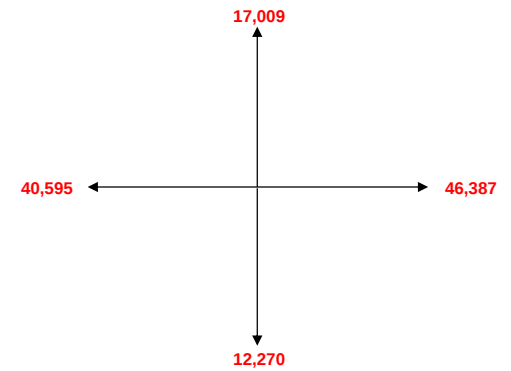
Existing Peak Hour Turning Movement Volumes (PM)



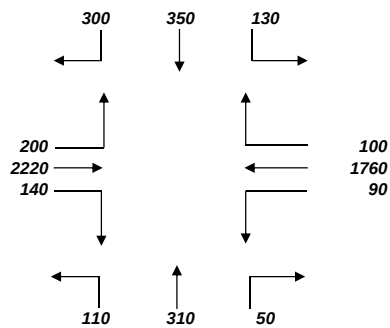
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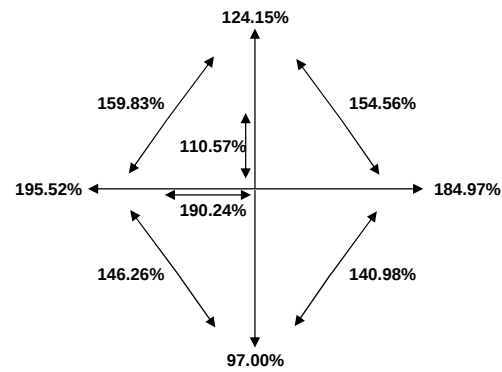
2025 ADTs



2025 Peak Hour Turning Movement Volumes (PM-Calculated)



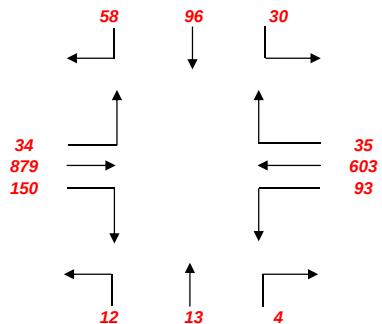
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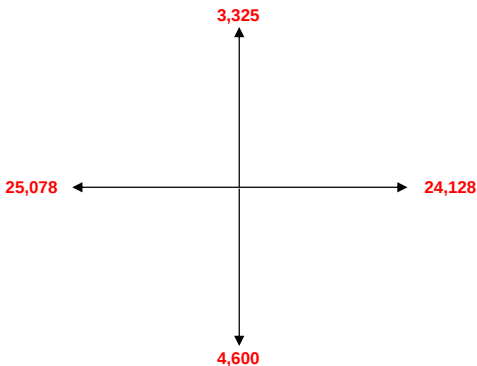
Year 2025 AM Peak Hour Turning Movement Calculations w/ Project

Magnolia Avenue and Overland Street

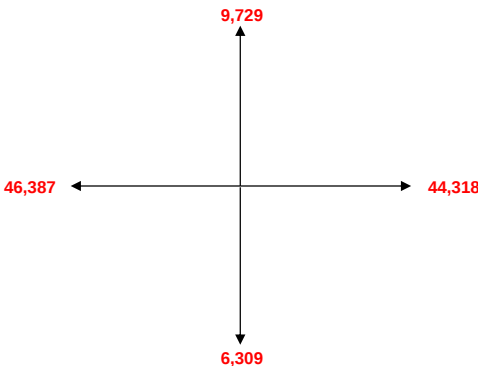
Existing Peak Hour Turning Movement Volumes (AM)



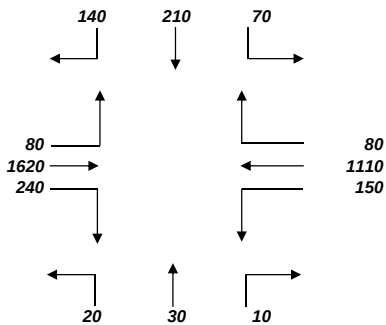
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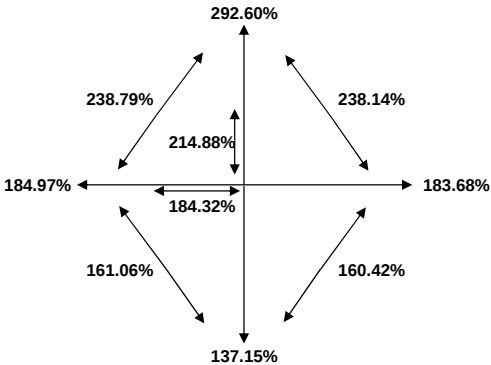
2025 ADTs



2025 Peak Hour Turning Movement Volumes (Calculated)



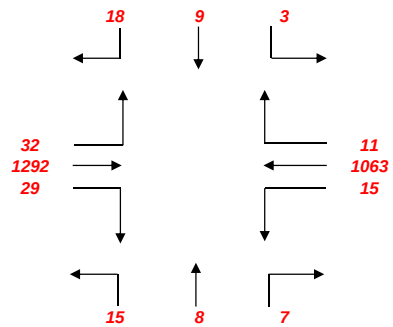
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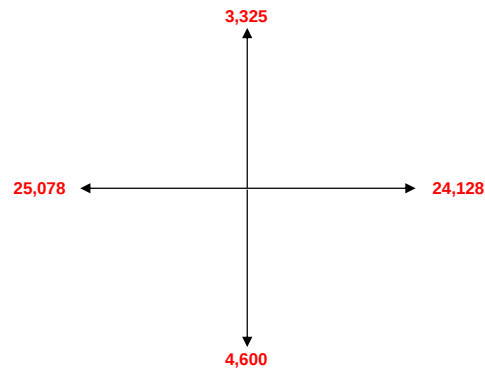
Year 2025 PM Peak Hour Turning Movement Calculations w/ Project

Magnolia Avenue and Overland Street

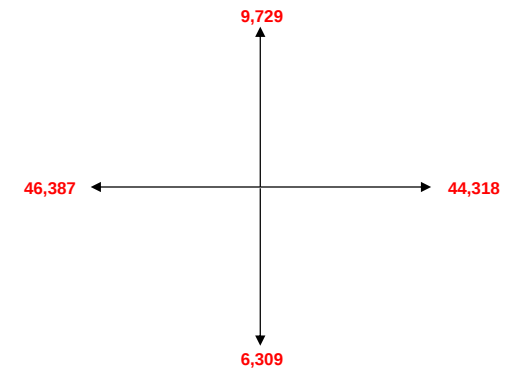
Existing Peak Hour Turning Movement Volumes (PM)



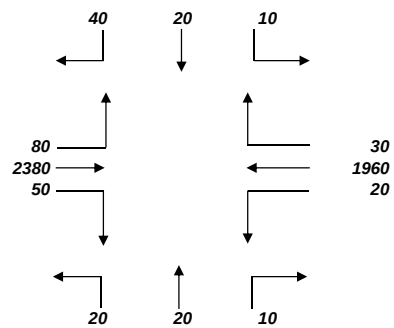
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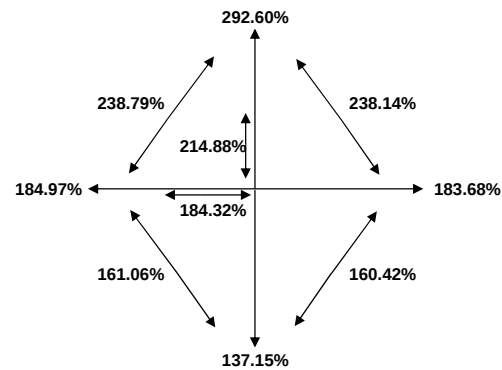
2025 ADTs



2025 Peak Hour Turning Movement Volumes (PM-Calculated)



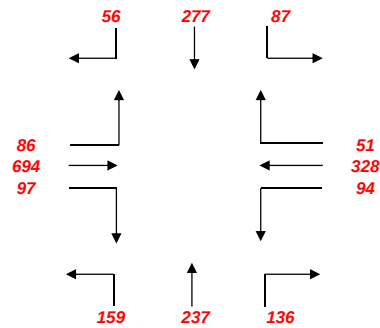
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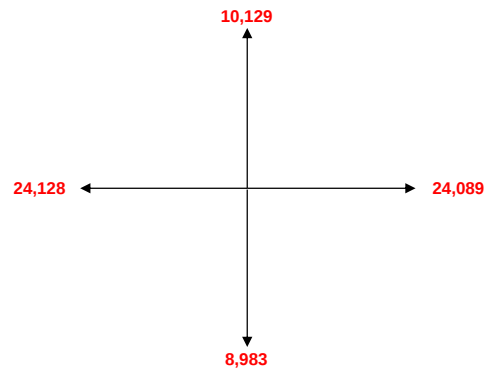
Year 2025 AM Peak Hour Turning Movement Calculations w/ Project

Monroe Street and Magnolia Avenue

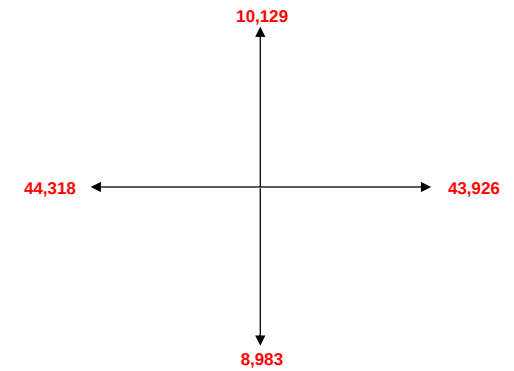
Existing Peak Hour Turning Movement Volumes (AM)



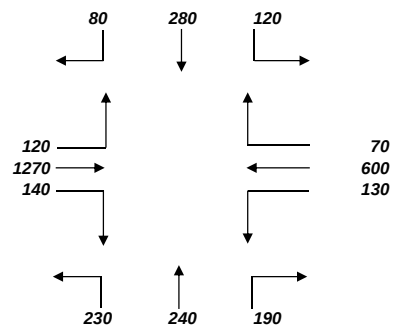
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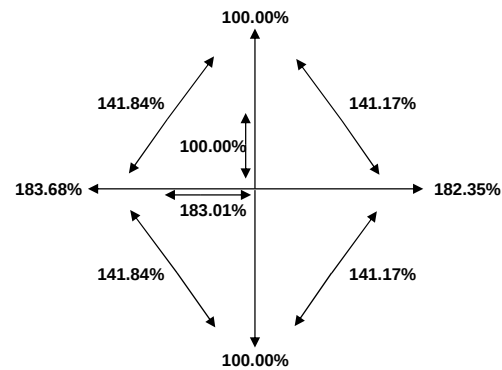
2025 ADTs



2025 Peak Hour Turning Movement Volumes (Calculated)



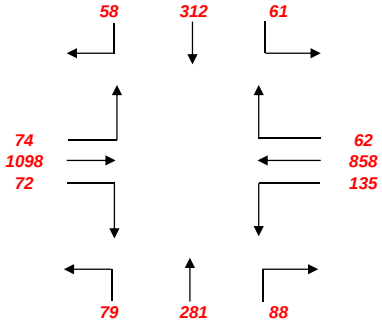
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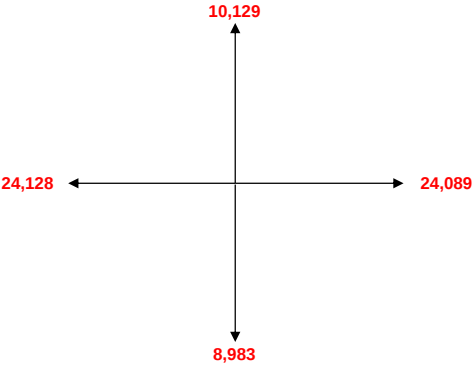
Year 2025 PM Peak Hour Turning Movement Calculations w/ Project

Monroe Street and Magnolia Avenue

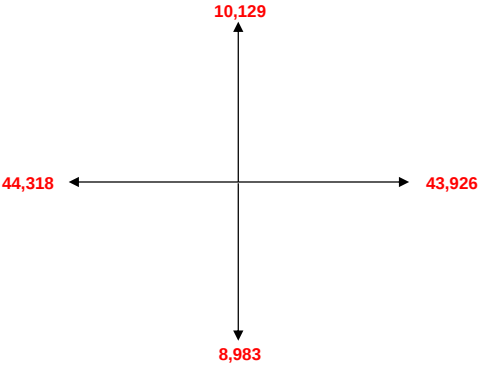
Existing Peak Hour Turning Movement Volumes (PM)



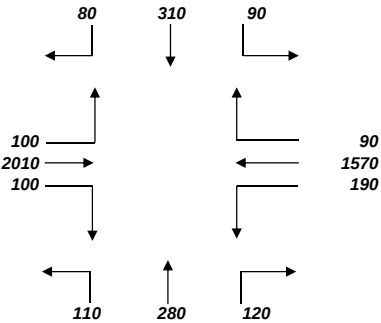
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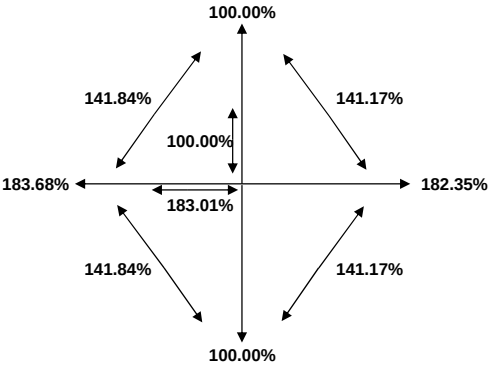
2025 ADTs



2025 Peak Hour Turning Movement Volumes (PM-Calculated)



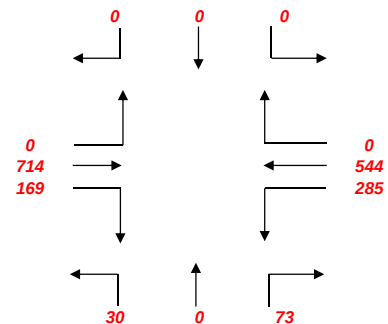
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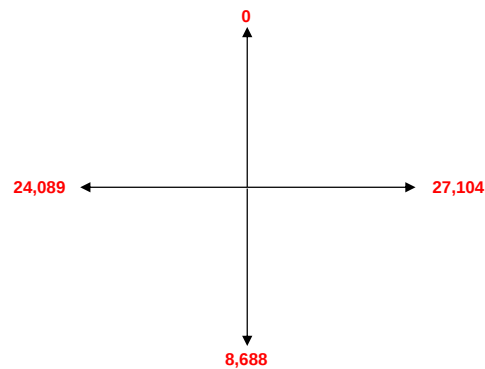
Year 2025 AM Peak Hour Turning Movement Calculations w/ Project

Campus Bridge Drive and Magnolia Avenue

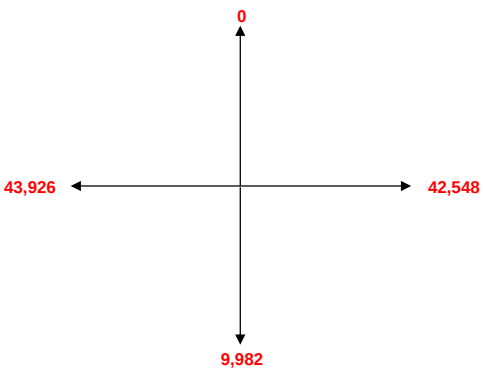
Existing Peak Hour Turning Movement Volumes (AM)



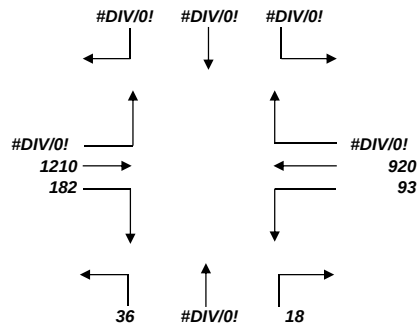
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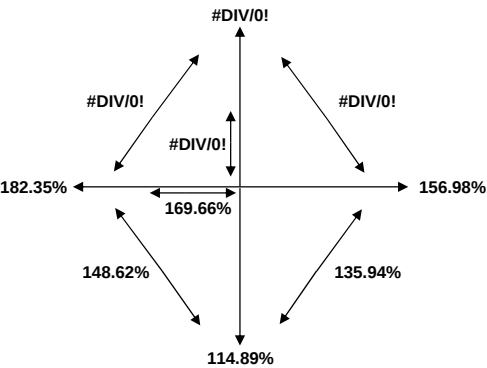
2025 ADTs



2025 Peak Hour Turning Movement Volumes (Calculated)



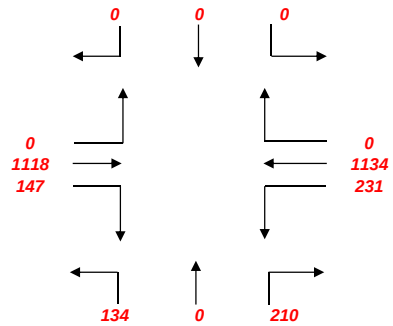
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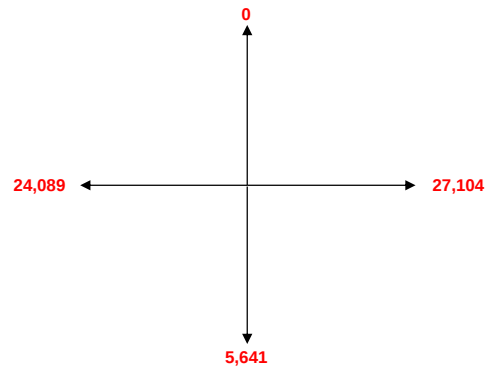
Year 2025 PM Peak Hour Turning Movement Calculations w/ Project

Campus Bridge Drive and Magnolia Avenue

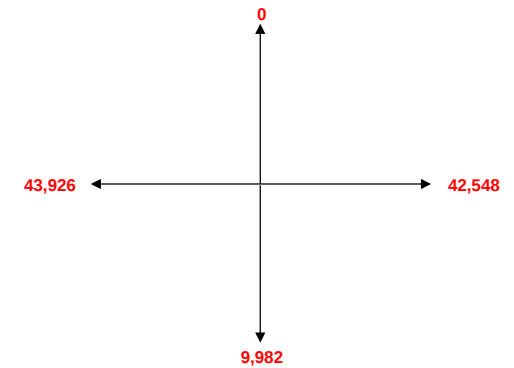
Existing Peak Hour Turning Movement Volumes (PM)



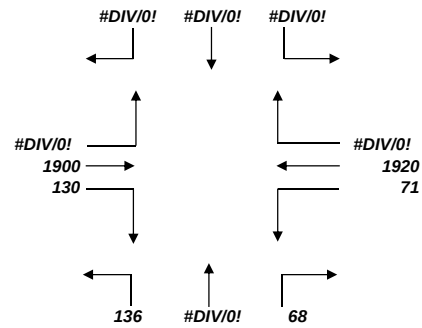
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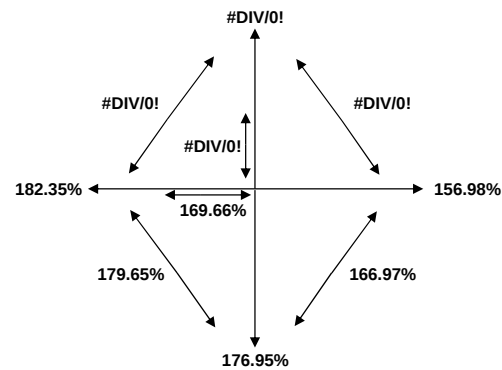
2025 ADTs



2025 Peak Hour Turning Movement Volumes (PM-Calculated)



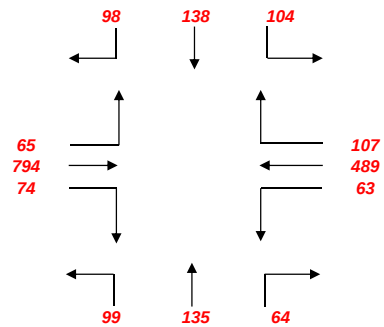
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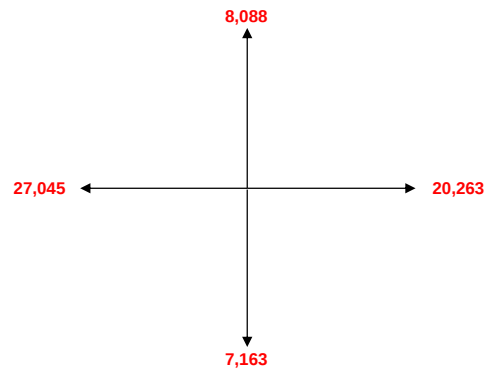
Year 2025 AM Peak Hour Turning Movement Calculations w/ Project

Jefferson Street and Magnolia Avenue

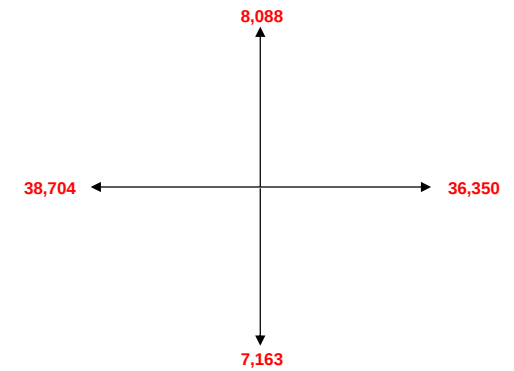
Existing Peak Hour Turning Movement Volumes (AM)



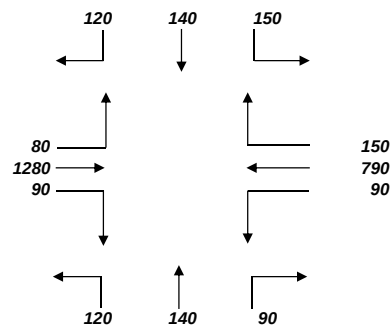
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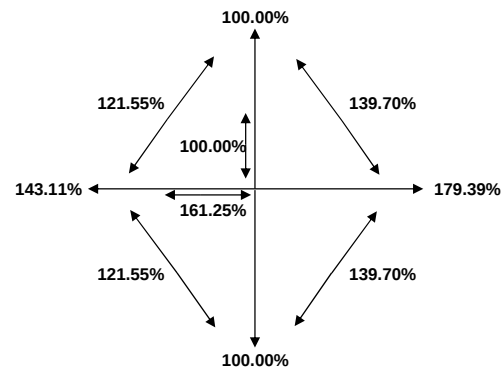
2025 ADTs



2025 Peak Hour Turning Movement Volumes (Calculated)



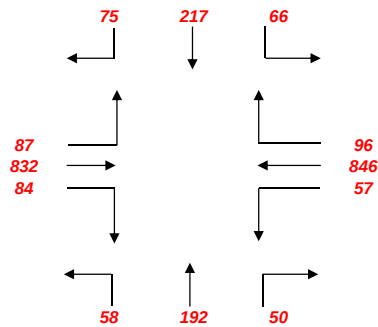
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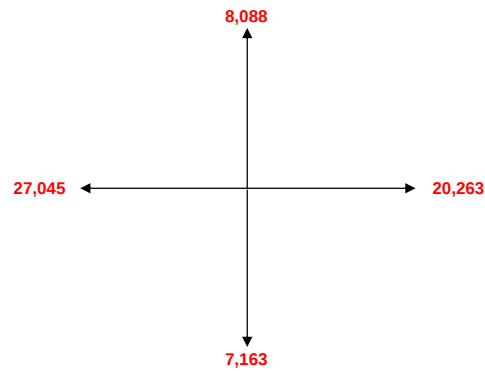
Year 2025 PM Peak Hour Turning Movement Calculations w/ Project

Jefferson Street and Magnolia Avenue

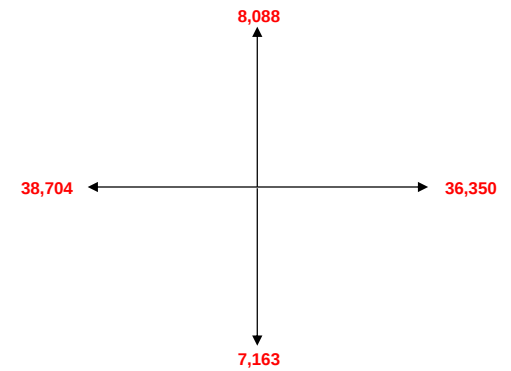
Existing Peak Hour Turning Movement Volumes (PM)



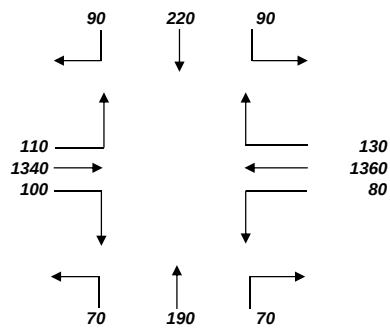
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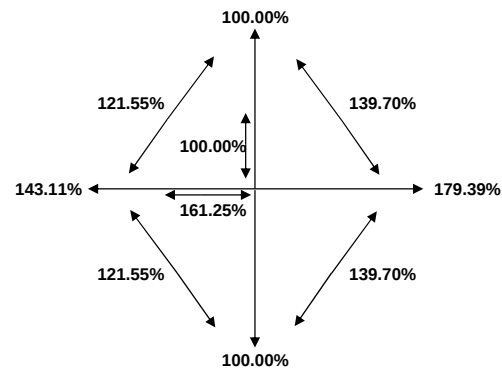
2025 ADTs



2025 Peak Hour Turning Movement Volumes (PM-Calculated)



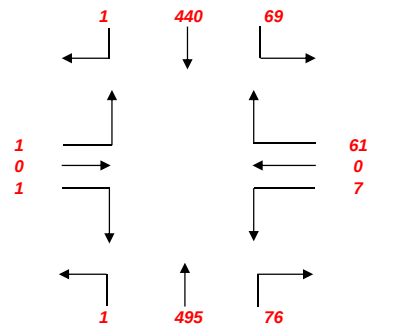
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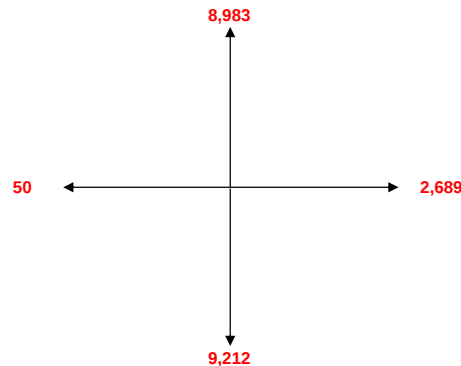
Year 2025 AM Peak Hour Turning Movement Calculations w/ Project

Diana Avenue and Monroe Street

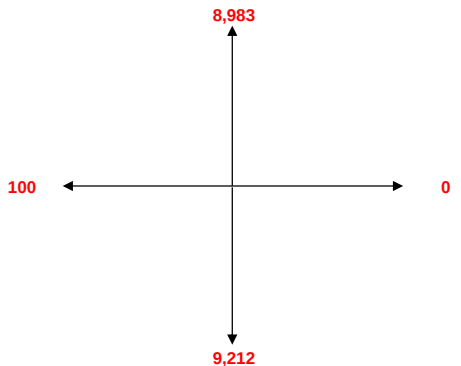
Existing Peak Hour Turning Movement Volumes (AM)



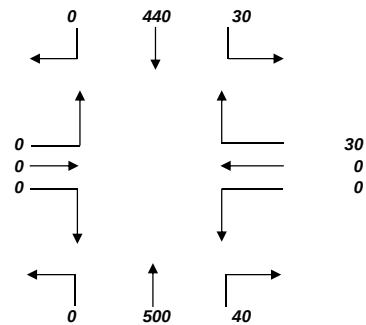
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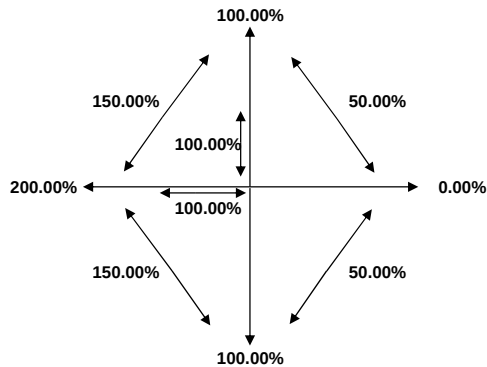
2025 ADTs



2025 Peak Hour Turning Movement Volumes (Calculated)



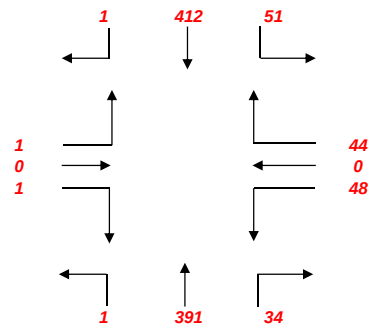
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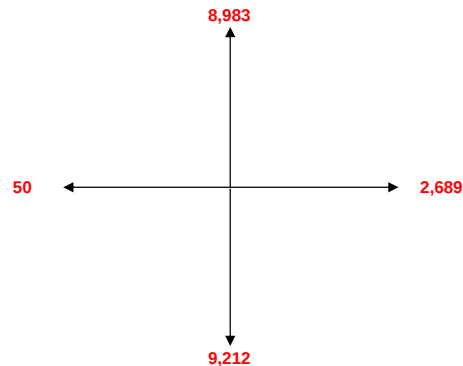
Year 2025 PM Peak Hour Turning Movement Calculations w/ Project

Diana Avenue and Monroe Street

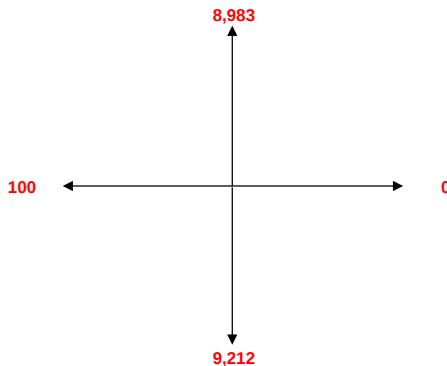
Existing Peak Hour Turning Movement Volumes (PM)



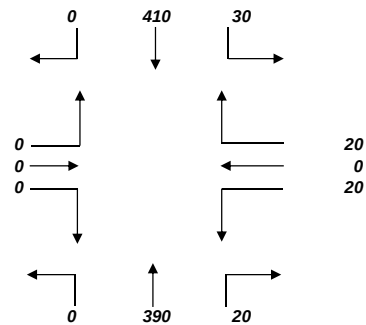
Existing ADTs



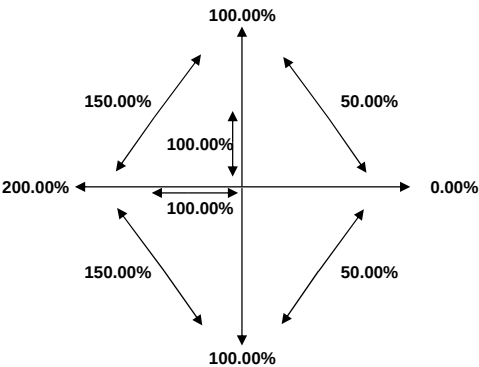
2025 ADTs



2025 Peak Hour Turning Movement Volumes (PM-Calculated)



percent increase/decrease



APPENDIX I

Queuing Analysis

Existing Conditions - AM Peak Hour
1: Adams Street & Garfield Street

Synchro 9 Report
4/8/2016



Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	250	151	105	931	53	990
v/c Ratio	0.54	0.42	0.37	0.51	0.21	0.68
Control Delay	12.4	14.2	24.2	9.5	22.8	14.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.4	14.2	24.2	9.5	22.8	14.2
Queue Length 50th (ft)	23	20	27	47	14	106
Queue Length 95th (ft)	63	52	65	154	39	173
Internal Link Dist (ft)	1516	839		1277		1231
Turn Bay Length (ft)			50		50	
Base Capacity (vph)	896	768	308	2169	264	1847
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.20	0.34	0.43	0.20	0.54
Intersection Summary						

Existing Conditions - PM Peak Hour
1: Adams Street & Garfield Street

Synchro 9 Report
4/8/2016



Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	74	45	41	750	18	564
v/c Ratio	0.23	0.14	0.17	0.26	0.09	0.21
Control Delay	10.7	11.5	17.9	3.9	18.2	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.7	11.5	17.9	3.9	18.2	5.2
Queue Length 50th (ft)	4	3	5	0	2	0
Queue Length 95th (ft)	32	25	30	100	18	77
Internal Link Dist (ft)	1516	839		1277		1231
Turn Bay Length (ft)			50		50	
Base Capacity (vph)	918	958	237	2864	190	2704
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.05	0.17	0.26	0.09	0.21
Intersection Summary						



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	98	877	128	710	422	672	288	272	847
v/c Ratio	0.74	0.87	0.81	0.66	0.85	0.62	0.41	0.87	0.73
Control Delay	82.0	48.3	86.1	32.9	63.6	36.8	7.7	73.7	37.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	82.0	48.3	86.1	32.9	63.6	36.8	7.7	73.7	37.7
Queue Length 50th (ft)	72	315	94	204	157	224	19	196	286
Queue Length 95th (ft)	#149	#407	#190	263	#224	280	80	#326	350
Internal Link Dist (ft)		1368		2600		1492			1277
Turn Bay Length (ft)	180		135		145		245	105	
Base Capacity (vph)	140	1005	163	1069	517	1090	704	327	1173
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.87	0.79	0.66	0.82	0.62	0.41	0.83	0.72

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	127	1283	145	1030	463	451	164	178	473
v/c Ratio	0.69	0.91	0.85	0.76	0.93	0.64	0.35	0.73	0.72
Control Delay	63.2	38.4	84.1	31.1	68.9	40.8	7.4	58.8	42.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.2	38.4	84.1	31.1	68.9	40.8	7.4	58.8	42.1
Queue Length 50th (ft)	77	377	91	290	149	139	0	107	140
Queue Length 95th (ft)	#168	#575	#215	405	#265	191	52	#208	194
Internal Link Dist (ft)		1368		2600		1492			1277
Turn Bay Length (ft)	180		135		145		245	105	
Base Capacity (vph)	194	1406	171	1362	498	1259	718	269	1239
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.91	0.85	0.76	0.93	0.36	0.23	0.66	0.38

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	98	81	31	1275	11	1029
v/c Ratio	0.22	0.19	0.09	0.88	0.04	0.77
Control Delay	25.0	23.7	38.1	30.2	35.1	32.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.0	23.7	38.1	30.2	35.1	32.9
Queue Length 50th (ft)	41	32	17	406	6	312
Queue Length 95th (ft)	76	63	m32	450	20	348
Internal Link Dist (ft)	97	247		351		1492
Turn Bay Length (ft)			195		48	
Base Capacity (vph)	478	451	393	1447	314	1342
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.18	0.08	0.88	0.04	0.77

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	185	46	38	1039	9	986
v/c Ratio	0.36	0.10	0.10	0.85	0.03	0.89
Control Delay	22.3	17.8	28.8	36.5	30.1	41.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.3	17.8	28.8	36.5	30.1	41.9
Queue Length 50th (ft)	68	13	18	300	4	293
Queue Length 95th (ft)	127	39	44	#385	17	#410
Internal Link Dist (ft)	97	247		351		1492
Turn Bay Length (ft)			195		48	
Base Capacity (vph)	554	503	434	1228	382	1111
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.09	0.09	0.85	0.02	0.89

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	546	501	240	869	1121
v/c Ratio	0.87	0.81	0.81	0.44	0.64
Control Delay	42.8	33.0	60.9	11.2	8.6
Queue Delay	0.6	0.0	9.6	1.7	0.3
Total Delay	43.4	33.0	70.4	12.9	9.0
Queue Length 50th (ft)	311	236	137	161	68
Queue Length 95th (ft)	391	315	210	185	104
Internal Link Dist (ft)	487			185	10
Turn Bay Length (ft)					
Base Capacity (vph)	700	685	330	1980	1746
Starvation Cap Reductn	0	0	63	889	0
Spillback Cap Reductn	25	0	0	0	178
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.81	0.73	0.90	0.80	0.71
Intersection Summary					



Lane Group	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	323	303	337	694	1121
v/c Ratio	0.80	0.56	0.81	0.28	0.55
Control Delay	45.3	10.1	34.1	6.7	21.9
Queue Delay	0.0	0.0	5.0	1.8	0.2
Total Delay	45.4	10.1	39.1	8.4	22.0
Queue Length 50th (ft)	170	20	165	83	167
Queue Length 95th (ft)	260	92	m167	m150	256
Internal Link Dist (ft)	438			185	10
Turn Bay Length (ft)					
Base Capacity (vph)	494	612	528	2473	2045
Starvation Cap Reductn	0	0	130	1560	0
Spillback Cap Reductn	2	0	0	0	224
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.66	0.50	0.85	0.76	0.62

Intersection Summary

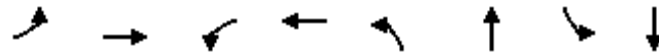
m Volume for 95th percentile queue is metered by upstream signal.

	→	↘	↑	↙	↓
Lane Group	EBT	EBR	NBT	SBL	SBT
Lane Group Flow (vph)	475	586	715	271	604
v/c Ratio	0.78	0.85	0.42	0.80	0.29
Control Delay	39.7	30.4	15.9	47.7	9.2
Queue Delay	0.2	54.2	0.3	10.4	1.3
Total Delay	39.9	84.6	16.2	58.1	10.5
Queue Length 50th (ft)	280	230	50	183	122
Queue Length 95th (ft)	361	346	57	m245	179
Internal Link Dist (ft)	522		75		185
Turn Bay Length (ft)					
Base Capacity (vph)	743	796	1701	409	2054
Starvation Cap Reductn	0	0	417	109	1180
Spillback Cap Reductn	24	367	76	0	49
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.66	1.37	0.56	0.90	0.69
Intersection Summary					
m Volume for 95th percentile queue is metered by upstream signal.					

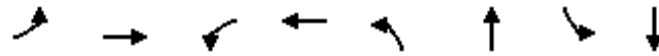
	→	↘	↑	↙	↓
Lane Group	EBT	EBR	NBT	SBL	SBT
Lane Group Flow (vph)	668	699	795	481	422
v/c Ratio	0.95	0.82	0.79	0.96	0.23
Control Delay	54.3	20.7	36.4	56.1	7.6
Queue Delay	9.7	0.0	51.2	4.5	0.5
Total Delay	64.0	20.7	87.6	60.6	8.1
Queue Length 50th (ft)	402	185	138	307	41
Queue Length 95th (ft)	#635	#366	#187	#474	35
Internal Link Dist (ft)	522		75		185
Turn Bay Length (ft)					
Base Capacity (vph)	710	862	1007	512	1855
Starvation Cap Reductn	0	0	389	16	998
Spillback Cap Reductn	41	0	4	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.00	0.81	1.29	0.97	0.49

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



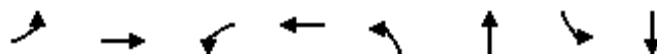
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	113	502	42	234	21	517	380	872
v/c Ratio	0.60	0.70	0.42	0.49	0.22	0.40	0.82	0.40
Control Delay	58.3	43.9	61.2	26.8	53.6	28.7	40.7	11.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	53.6	0.9
Total Delay	58.3	43.9	61.2	26.8	53.6	28.7	94.3	12.6
Queue Length 50th (ft)	73	164	28	42	14	141	258	124
Queue Length 95th (ft)	130	216	64	78	40	218	227	200
Internal Link Dist (ft)		1051		991		2587		75
Turn Bay Length (ft)	130		95		145		75	
Base Capacity (vph)	219	772	101	591	95	1279	590	2196
Starvation Cap Reductn	0	0	0	0	0	0	242	965
Spillback Cap Reductn	0	0	0	0	0	57	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.65	0.42	0.40	0.22	0.42	1.09	0.71
Intersection Summary								



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	194	429	38	442	43	538	300	857
v/c Ratio	0.66	0.40	0.30	0.64	0.34	0.55	0.99	0.57
Control Delay	42.9	20.1	37.4	18.1	38.7	23.9	82.3	17.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	40.7	23.3
Total Delay	42.9	20.1	37.4	18.1	38.7	23.9	123.0	40.9
Queue Length 50th (ft)	76	75	16	48	18	103	131	153
Queue Length 95th (ft)	#193	110	42	78	45	145	#263	204
Internal Link Dist (ft)		1051		991		2587		75
Turn Bay Length (ft)	130		95		145		75	
Base Capacity (vph)	292	1064	126	913	126	980	303	1503
Starvation Cap Reductn	0	0	0	0	0	0	119	667
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.66	0.40	0.30	0.48	0.34	0.55	1.63	1.03

Intersection Summary

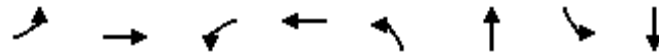
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	141	236	5	377	15	473	146	236
v/c Ratio	0.74	0.21	0.04	0.55	0.12	0.41	0.76	0.14
Control Delay	51.3	14.3	26.0	15.4	27.6	16.2	54.1	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.3	14.3	26.0	15.4	27.6	16.2	54.1	7.4
Queue Length 50th (ft)	46	26	2	35	5	61	48	13
Queue Length 95th (ft)	#110	50	9	55	18	92	#114	36
Internal Link Dist (ft)		1221		1308		1386		2587
Turn Bay Length (ft)	120		140		150		200	
Base Capacity (vph)	191	1339	127	1242	127	1149	191	1661
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.18	0.04	0.30	0.12	0.41	0.76	0.14

Intersection Summary

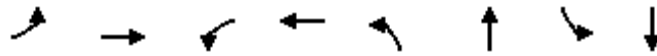
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	62	179	13	397	5	160	145	464
v/c Ratio	0.44	0.19	0.09	0.52	0.04	0.12	0.55	0.25
Control Delay	39.1	14.6	28.1	19.2	27.0	14.1	33.7	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.1	14.6	28.1	19.2	27.0	14.1	33.7	8.1
Queue Length 50th (ft)	21	20	4	55	2	18	47	33
Queue Length 95th (ft)	#60	42	18	80	10	37	#103	76
Internal Link Dist (ft)		1221		1308		1386		2587
Turn Bay Length (ft)	120		140		150		200	
Base Capacity (vph)	140	1351	140	1322	140	1333	280	1823
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.13	0.09	0.30	0.04	0.12	0.52	0.25

Intersection Summary

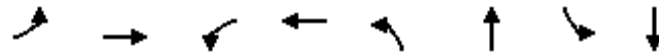
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	140	1047	89	741	98	604	127	432
v/c Ratio	0.66	0.84	0.74	0.67	0.64	0.67	0.84	0.41
Control Delay	46.1	26.7	68.3	21.4	52.0	22.9	75.4	16.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.1	26.7	68.3	21.4	52.0	22.9	75.4	16.8
Queue Length 50th (ft)	53	188	35	123	38	100	50	60
Queue Length 95th (ft)	#120	#243	#97	166	#97	134	#129	86
Internal Link Dist (ft)		940		1530		2241		2375
Turn Bay Length (ft)	170		110		150		125	
Base Capacity (vph)	212	1329	121	1151	152	1094	152	1118
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.66	0.79	0.74	0.64	0.64	0.55	0.84	0.39

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	136	1386	74	1092	85	343	96	558
v/c Ratio	0.77	0.95	0.63	0.88	0.72	0.45	0.81	0.59
Control Delay	58.9	36.4	55.6	30.1	65.9	20.9	79.6	16.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.9	36.4	55.6	30.1	65.9	20.9	79.6	16.6
Queue Length 50th (ft)	49	~273	27	190	31	53	36	64
Queue Length 95th (ft)	#144	#465	#90	#347	#105	86	#118	108
Internal Link Dist (ft)		940		1530		2241		2375
Turn Bay Length (ft)	170		110		150		125	
Base Capacity (vph)	177	1455	118	1237	118	1060	118	1129
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.77	0.95	0.63	0.88	0.72	0.32	0.81	0.49

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	38	1157	104	717	32	207
v/c Ratio	0.08	0.51	0.43	0.32	0.07	0.43
Control Delay	5.4	6.4	13.4	5.2	13.5	15.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.4	6.4	13.4	5.2	13.5	15.3
Queue Length 50th (ft)	3	67	11	36	4	29
Queue Length 95th (ft)	15	148	59	82	24	97
Internal Link Dist (ft)		1530		999	321	2410
Turn Bay Length (ft)	110		110			
Base Capacity (vph)	588	2917	316	2953	894	931
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.40	0.33	0.24	0.04	0.22
Intersection Summary						



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	33	1376	16	1118	31	31
v/c Ratio	0.08	0.42	0.05	0.34	0.06	0.07
Control Delay	1.9	1.7	1.8	1.4	11.5	9.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.9	1.7	1.8	1.4	11.5	9.5
Queue Length 50th (ft)	0	0	0	0	2	1
Queue Length 95th (ft)	9	117	5	85	24	21
Internal Link Dist (ft)		1530		999	321	2410
Turn Bay Length (ft)	110		110			
Base Capacity (vph)	438	3306	349	3313	1413	1338
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.42	0.05	0.34	0.02	0.02
Intersection Summary						



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	112	1027	122	492	206	308	177	113	433
v/c Ratio	0.62	0.91	0.78	0.46	0.87	0.48	0.27	0.62	0.74
Control Delay	62.9	49.2	81.7	33.4	80.8	33.6	5.4	63.1	43.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.9	49.2	81.7	33.4	80.8	33.6	5.4	63.1	43.8
Queue Length 50th (ft)	80	374	90	150	151	181	0	81	284
Queue Length 95th (ft)	115	370	#141	172	#214	227	28	117	327
Internal Link Dist (ft)		999		1167		2219			326
Turn Bay Length (ft)	105		115		150		150	150	
Base Capacity (vph)	230	1176	165	1069	248	644	646	224	582
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.87	0.74	0.46	0.83	0.48	0.27	0.50	0.74

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	84	1330	153	1045	90	319	100	69	421
v/c Ratio	0.60	0.94	0.94	0.69	0.84	0.51	0.17	0.68	0.73
Control Delay	68.8	46.3	109.7	30.1	106.7	35.9	6.7	85.1	43.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.8	46.3	109.7	30.1	106.7	35.9	6.7	85.1	43.8
Queue Length 50th (ft)	60	485	114	336	67	197	1	51	274
Queue Length 95th (ft)	111	#606	#238	403	#159	281	38	#118	382
Internal Link Dist (ft)		999		1167		2219			326
Turn Bay Length (ft)	105		115		150		150	150	
Base Capacity (vph)	156	1445	162	1525	107	620	575	103	573
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.92	0.94	0.69	0.84	0.51	0.17	0.67	0.73

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	981	317	604	33	81
v/c Ratio	0.85	0.86	0.29	0.06	0.14
Control Delay	38.1	59.8	10.3	23.9	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	38.1	59.8	10.3	23.9	6.3
Queue Length 50th (ft)	295	192	90	15	0
Queue Length 95th (ft)	#383	#330	120	37	33
Internal Link Dist (ft)	1167		1368	223	
Turn Bay Length (ft)		160		100	
Base Capacity (vph)	1193	407	2196	585	578
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.82	0.78	0.28	0.06	0.14

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



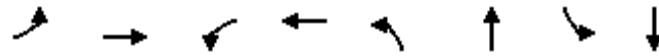
Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1345	246	1206	143	223
v/c Ratio	0.96	0.91	0.57	0.25	0.34
Control Delay	45.5	78.5	13.5	26.6	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	45.5	78.5	13.5	26.6	5.0
Queue Length 50th (ft)	427	156	227	67	0
Queue Length 95th (ft)	#584	#299	286	117	51
Internal Link Dist (ft)	1167		1368	223	
Turn Bay Length (ft)		160		100	
Base Capacity (vph)	1404	274	2127	567	659
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.96	0.90	0.57	0.25	0.34

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Existing Conditions - AM Peak Hour
14: Jefferson Street & Magnolia Avenue

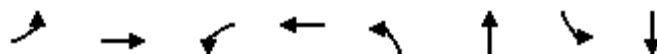
Synchro 9 Report
4/8/2016



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	81	1086	79	745	124	249	130	296
v/c Ratio	0.52	0.84	0.63	0.60	0.79	0.58	0.83	0.68
Control Delay	42.3	25.8	55.2	18.0	66.8	23.3	72.4	25.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.3	25.8	55.2	18.0	66.8	23.3	72.4	25.5
Queue Length 50th (ft)	29	185	29	109	46	69	48	80
Queue Length 95th (ft)	#72	240	#81	151	#119	111	#125	128
Internal Link Dist (ft)		2600		1278		1745		1836
Turn Bay Length (ft)	110		110		140		140	
Base Capacity (vph)	157	1377	125	1313	157	592	157	596
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.79	0.63	0.57	0.79	0.42	0.83	0.50

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	93	974	61	1002	62	257	70	311
v/c Ratio	0.52	0.73	0.50	0.86	0.51	0.45	0.58	0.50
Control Delay	40.5	20.6	46.8	29.1	47.3	20.8	52.1	20.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.5	20.6	46.8	29.1	47.3	20.8	52.1	20.7
Queue Length 50th (ft)	36	174	24	190	25	78	28	97
Queue Length 95th (ft)	#92	242	#73	#302	#74	142	#85	172
Internal Link Dist (ft)		2600		1278		1745		1836
Turn Bay Length (ft)	110		110		140		140	
Base Capacity (vph)	183	1479	121	1274	121	573	121	617
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.66	0.50	0.79	0.51	0.45	0.58	0.50

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Existing + Ambient Conditions - AM Peak Hour
1: Adams Street & Garfield Street

Synchro 9 Report
4/8/2016



Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	272	165	114	1015	58	1081
v/c Ratio	0.59	0.46	0.42	0.57	0.28	0.71
Control Delay	14.7	15.2	28.0	11.1	27.4	15.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.7	15.2	28.0	11.1	27.4	15.3
Queue Length 50th (ft)	34	24	33	106	17	127
Queue Length 95th (ft)	77	58	74	175	46	205
Internal Link Dist (ft)	1516	839		1277		1231
Turn Bay Length (ft)			50		50	
Base Capacity (vph)	774	643	287	2131	205	1888
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.26	0.40	0.48	0.28	0.57
Intersection Summary						

Existing + Ambient Conditions - PM Peak Hour
 1: Adams Street & Garfield Street

Synchro 9 Report
 4/8/2016



Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	80	50	45	818	20	615
v/c Ratio	0.25	0.15	0.19	0.29	0.10	0.23
Control Delay	10.7	11.3	18.0	4.1	18.3	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.7	11.3	18.0	4.1	18.3	5.3
Queue Length 50th (ft)	4	3	5	0	2	0
Queue Length 95th (ft)	34	26	32	112	19	85
Internal Link Dist (ft)	1516	839		1277		1231
Turn Bay Length (ft)			50		50	
Base Capacity (vph)	896	969	240	2861	192	2702
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.05	0.19	0.29	0.10	0.23
Intersection Summary						

Existing + Ambient Conditions - AM Peak Hour
2: Adams Street & Magnolia Avenue

Synchro 9 Report
4/8/2016



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	107	957	140	775	459	732	314	297	923
v/c Ratio	0.69	0.93	0.93	0.73	0.81	0.83	0.51	0.87	0.97
Control Delay	63.6	45.6	99.6	28.1	48.3	41.5	10.6	60.6	56.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.6	45.6	99.6	28.1	48.3	41.5	10.6	60.6	56.2
Queue Length 50th (ft)	60	265	81	170	129	208	30	164	271
Queue Length 95th (ft)	#131	#372	#187	230	#190	#288	97	#289	#389
Internal Link Dist (ft)		1368		2600		1492			1277
Turn Bay Length (ft)	180		135		145		245	105	
Base Capacity (vph)	161	1050	151	1058	587	882	614	358	951
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.66	0.91	0.93	0.73	0.78	0.83	0.51	0.83	0.97

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Existing + Ambient Conditions - PM Peak Hour
2: Adams Street & Magnolia Avenue

Synchro 9 Report
4/8/2016



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	138	1399	158	1122	505	492	180	194	515
v/c Ratio	0.96	1.07	1.04	0.87	0.87	0.62	0.34	0.79	0.78
Control Delay	108.1	73.6	125.8	34.6	52.8	34.8	6.6	59.9	41.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	108.1	73.6	125.8	34.6	52.8	34.8	6.6	59.9	41.3
Queue Length 50th (ft)	80	~460	~99	305	145	131	0	107	137
Queue Length 95th (ft)	#195	#596	#221	#430	#230	183	50	#212	194
Internal Link Dist (ft)		1368		2600		1492			1277
Turn Bay Length (ft)	180		135		145		245	105	
Base Capacity (vph)	144	1307	152	1295	593	844	548	261	725
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	1.07	1.04	0.87	0.85	0.58	0.33	0.74	0.71

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	89	88	34	1391	12	1122
v/c Ratio	0.21	0.21	0.09	0.95	0.04	0.82
Control Delay	28.6	24.5	38.1	35.0	35.7	35.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.6	24.5	38.1	35.0	35.7	35.3
Queue Length 50th (ft)	43	36	18	403	7	353
Queue Length 95th (ft)	77	70	m33	474	21	390
Internal Link Dist (ft)	218	247		351		1492
Turn Bay Length (ft)			195		48	
Base Capacity (vph)	422	419	358	1466	311	1363
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.21	0.09	0.95	0.04	0.82

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	202	49	41	1132	10	1075
v/c Ratio	0.63	0.18	0.15	0.62	0.04	0.59
Control Delay	38.8	24.8	35.3	18.4	33.6	17.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.8	24.8	35.3	18.4	33.6	17.7
Queue Length 50th (ft)	98	17	21	231	5	212
Queue Length 95th (ft)	160	46	51	341	20	315
Internal Link Dist (ft)	97	247		351		1492
Turn Bay Length (ft)			195		48	
Base Capacity (vph)	394	339	278	1834	278	1821
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.14	0.15	0.62	0.04	0.59
Intersection Summary						



Lane Group	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	595	546	261	947	1223
v/c Ratio	0.91	0.86	0.86	0.49	0.74
Control Delay	47.5	39.5	62.1	13.6	9.6
Queue Delay	0.6	0.0	22.5	3.1	0.8
Total Delay	48.1	39.5	84.6	16.7	10.4
Queue Length 50th (ft)	352	287	151	208	182
Queue Length 95th (ft)	454	385	#253	214	136
Internal Link Dist (ft)	487			185	10
Turn Bay Length (ft)					
Base Capacity (vph)	693	667	327	1923	1649
Starvation Cap Reductn	0	0	64	842	0
Spillback Cap Reductn	11	0	0	0	176
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.87	0.82	0.99	0.88	0.83

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	353	331	367	757	1222
v/c Ratio	0.84	0.62	0.85	0.31	0.62
Control Delay	48.9	15.0	41.7	10.2	23.8
Queue Delay	1.5	0.0	38.0	1.5	0.1
Total Delay	50.4	15.0	79.7	11.8	23.9
Queue Length 50th (ft)	188	49	212	133	202
Queue Length 95th (ft)	#302	141	m199	m122	273
Internal Link Dist (ft)	438			185	10
Turn Bay Length (ft)					
Base Capacity (vph)	478	580	495	2434	1959
Starvation Cap Reductn	0	0	146	1432	0
Spillback Cap Reductn	36	0	0	0	91
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.80	0.57	1.05	0.76	0.65

Intersection Summary

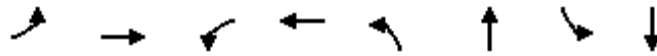
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

	→	↘	↑	↙	↓
Lane Group	EBT	EBR	NBT	SBL	SBT
Lane Group Flow (vph)	518	639	780	296	659
v/c Ratio	0.78	0.89	0.52	0.84	0.34
Control Delay	37.6	37.3	18.0	47.0	9.0
Queue Delay	1.2	53.5	0.4	32.8	1.6
Total Delay	38.8	90.8	18.3	79.9	10.6
Queue Length 50th (ft)	289	281	52	195	148
Queue Length 95th (ft)	403	#456	64	m255	m190
Internal Link Dist (ft)	522		75		185
Turn Bay Length (ft)					
Base Capacity (vph)	753	783	1512	405	1946
Starvation Cap Reductn	0	0	284	117	1058
Spillback Cap Reductn	88	370	69	0	10
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.78	1.55	0.64	1.03	0.74
Intersection Summary					
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.					
m Volume for 95th percentile queue is metered by upstream signal.					

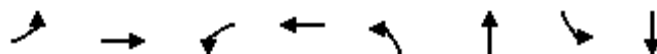
	→	↘	↑	↙	↓
Lane Group	EBT	EBR	NBT	SBL	SBT
Lane Group Flow (vph)	728	762	866	524	459
v/c Ratio	1.00	0.90	0.97dr	1.02	0.25
Control Delay	64.5	30.2	35.5	66.3	7.5
Queue Delay	0.0	47.7	44.3	9.3	1.3
Total Delay	64.5	77.9	79.8	75.6	8.8
Queue Length 50th (ft)	~455	272	159	~360	46
Queue Length 95th (ft)	#709	#538	#138	#538	44
Internal Link Dist (ft)	522		75		185
Turn Bay Length (ft)					
Base Capacity (vph)	727	849	914	512	1804
Starvation Cap Reductn	0	0	213	14	910
Spillback Cap Reductn	0	188	157	0	1100
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.00	1.15	1.24	1.05	0.65
Intersection Summary					
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.					
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.					
dr Defacto Right Lane. Recode with 1 though lane as a right lane.					



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	123	548	45	256	23	564	414	951
v/c Ratio	0.62	0.74	0.46	0.52	0.25	0.47	0.84	0.44
Control Delay	58.8	45.0	63.7	27.4	55.2	31.5	39.9	12.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.1	56.3	0.8
Total Delay	58.8	45.0	63.7	27.4	55.2	31.6	96.2	13.2
Queue Length 50th (ft)	80	181	30	46	15	166	198	145
Queue Length 95th (ft)	139	237	68	85	42	246	m242	314
Internal Link Dist (ft)		1051		991		2587		75
Turn Bay Length (ft)	130		95		145		75	
Base Capacity (vph)	233	797	100	594	93	1202	601	2176
Starvation Cap Reductn	0	0	0	0	0	0	256	855
Spillback Cap Reductn	0	0	0	1	0	96	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.69	0.45	0.43	0.25	0.51	1.20	0.72

Intersection Summary

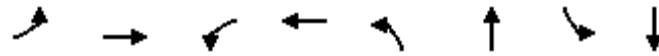
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	211	468	41	483	46	586	328	934
v/c Ratio	0.76	0.48	0.39	0.78	0.44	0.54	0.78	0.51
Control Delay	57.8	31.0	56.1	33.4	59.0	32.7	47.2	20.1
Queue Delay	0.8	0.0	0.0	0.1	0.0	0.9	63.0	6.7
Total Delay	58.6	31.0	56.1	33.5	59.0	33.6	110.2	26.8
Queue Length 50th (ft)	128	128	26	91	29	175	172	243
Queue Length 95th (ft)	197	166	58	138	63	231	m229	m295
Internal Link Dist (ft)		1051		991		2587		75
Turn Bay Length (ft)	130		95		145		75	
Base Capacity (vph)	318	1003	108	691	106	1081	477	1824
Starvation Cap Reductn	0	0	0	0	0	0	277	833
Spillback Cap Reductn	17	0	0	9	0	247	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.47	0.38	0.71	0.43	0.70	1.64	0.94

Intersection Summary

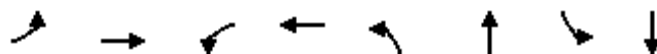
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	153	257	5	412	16	517	158	257
v/c Ratio	0.82	0.22	0.04	0.57	0.10	0.46	0.73	0.15
Control Delay	63.6	14.7	27.2	15.7	27.2	17.7	48.0	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.6	14.7	27.2	15.7	27.2	17.7	48.0	7.8
Queue Length 50th (ft)	52	30	2	40	5	71	53	15
Queue Length 95th (ft)	#126	56	9	60	19	105	#119	41
Internal Link Dist (ft)		1221		1308		1386		2587
Turn Bay Length (ft)	120		140		150		200	
Base Capacity (vph)	186	1262	124	1164	155	1115	217	1664
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.20	0.04	0.35	0.10	0.46	0.73	0.15

Intersection Summary

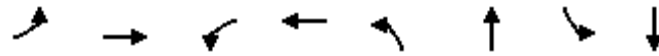
95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	68	195	15	432	5	175	159	506
v/c Ratio	0.54	0.19	0.12	0.57	0.04	0.15	0.64	0.28
Control Delay	45.9	14.3	29.1	20.6	27.5	15.0	39.7	9.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.9	14.3	29.1	20.6	27.5	15.0	39.7	9.0
Queue Length 50th (ft)	23	22	5	62	2	21	53	39
Queue Length 95th (ft)	#68	45	20	88	10	41	#119	86
Internal Link Dist (ft)		1221		1308		1386		2587
Turn Bay Length (ft)	120		140		150		200	
Base Capacity (vph)	127	1250	127	1209	127	1145	255	1779
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.16	0.12	0.36	0.04	0.15	0.62	0.28

Intersection Summary

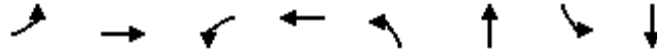
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	152	1063	98	807	106	658	139	471
v/c Ratio	0.67	0.80	0.73	0.78	0.66	0.76	0.87	0.47
Control Delay	45.2	25.0	65.8	26.8	53.5	28.5	79.3	20.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.2	25.0	65.8	26.8	53.5	28.5	79.3	20.1
Queue Length 50th (ft)	64	213	43	156	45	127	61	77
Queue Length 95th (ft)	#122	256	#105	195	#103	164	#142	107
Internal Link Dist (ft)		940		1530		2241		2375
Turn Bay Length (ft)	170		110		150		125	
Base Capacity (vph)	241	1334	134	1122	160	967	160	1018
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.63	0.80	0.73	0.72	0.66	0.68	0.87	0.46

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	148	1512	80	1189	92	374	104	609
v/c Ratio	0.79	0.97	0.75	0.91	0.86	0.48	0.97	0.70
Control Delay	62.5	38.5	75.2	32.6	94.4	23.4	120.3	22.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.5	38.5	75.2	32.6	94.4	23.4	120.3	22.2
Queue Length 50th (ft)	61	~361	33	236	39	66	44	87
Queue Length 95th (ft)	#160	#519	#107	#390	#123	103	#139	139
Internal Link Dist (ft)		940		1530		2241		2375
Turn Bay Length (ft)	170		110		150		125	
Base Capacity (vph)	187	1560	107	1329	107	959	107	1025
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.97	0.75	0.89	0.86	0.39	0.97	0.59

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	42	1260	113	781	35	226
v/c Ratio	0.10	0.54	0.51	0.33	0.08	0.48
Control Delay	5.6	6.7	19.7	5.3	15.1	17.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.6	6.7	19.7	5.3	15.1	17.9
Queue Length 50th (ft)	4	88	16	46	7	49
Queue Length 95th (ft)	17	178	#97	95	25	106
Internal Link Dist (ft)		1530		999	321	2410
Turn Bay Length (ft)	110		110			
Base Capacity (vph)	489	2646	249	2675	798	854
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.48	0.45	0.29	0.04	0.26

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	36	1500	17	1220	34	34
v/c Ratio	0.10	0.49	0.06	0.40	0.08	0.08
Control Delay	3.1	3.0	3.0	2.5	14.5	11.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.1	3.0	3.0	2.5	14.5	11.6
Queue Length 50th (ft)	0	0	0	0	2	1
Queue Length 95th (ft)	10	138	6	98	25	22
Internal Link Dist (ft)		1530		999	321	2410
Turn Bay Length (ft)	110		110			
Base Capacity (vph)	353	3102	271	3104	1209	1149
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.48	0.06	0.39	0.03	0.03
Intersection Summary						

Existing + Ambient Conditions - AM Peak Hour
12: Monroe Street & Magnolia Avenue

Synchro 9 Report
4/8/2016



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	122	1121	134	538	225	331	192	123	471
v/c Ratio	0.61	0.90	0.89	0.48	0.96	0.61	0.33	0.75	1.01
Control Delay	50.3	38.2	91.7	25.7	90.0	33.9	5.7	67.2	79.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.3	38.2	91.7	25.7	90.0	33.9	5.7	67.2	79.3
Queue Length 50th (ft)	66	305	77	124	129	165	0	69	~274
Queue Length 95th (ft)	101	310	#145	145	#211	208	29	#118	#363
Internal Link Dist (ft)		999		1167		2219			326
Turn Bay Length (ft)	105		115		150		150	150	
Base Capacity (vph)	237	1286	151	1127	235	539	581	170	466
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.87	0.89	0.48	0.96	0.61	0.33	0.72	1.01

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	92	1450	167	1140	98	348	109	76	458
v/c Ratio	0.66	1.01	0.89	0.71	0.84	0.71	0.23	0.60	1.00
Control Delay	63.4	54.1	84.6	23.7	93.9	41.1	7.2	60.7	76.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.4	54.1	84.6	23.7	93.9	41.1	7.2	60.7	76.1
Queue Length 50th (ft)	51	~432	95	278	56	186	0	43	256
Queue Length 95th (ft)	#116	#570	#205	345	#142	#305	38	#97	#440
Internal Link Dist (ft)		999		1167		2219			326
Turn Bay Length (ft)	105		115		150		150	150	
Base Capacity (vph)	144	1436	187	1609	116	489	483	131	460
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	1.01	0.89	0.71	0.84	0.71	0.23	0.58	1.00

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1068	346	659	37	89
v/c Ratio	0.85	0.82	0.28	0.09	0.20
Control Delay	30.2	45.0	5.8	25.2	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	30.2	45.0	5.8	25.2	7.6
Queue Length 50th (ft)	244	160	59	15	0
Queue Length 95th (ft)	#333	#287	81	39	35
Internal Link Dist (ft)	1167		1368	223	
Turn Bay Length (ft)		160		100	
Base Capacity (vph)	1345	476	2532	422	445
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.79	0.73	0.26	0.09	0.20

Intersection Summary

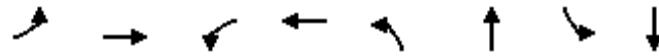
95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.



Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1467	268	1315	155	244
v/c Ratio	0.93	0.90	0.55	0.39	0.45
Control Delay	32.9	66.5	7.8	29.7	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	32.9	66.5	7.8	29.7	6.7
Queue Length 50th (ft)	346	132	153	66	0
Queue Length 95th (ft)	#505	#269	200	120	55
Internal Link Dist (ft)	1167		1368	223	
Turn Bay Length (ft)		160		100	
Base Capacity (vph)	1583	300	2395	399	546
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.93	0.89	0.55	0.39	0.45

Intersection Summary

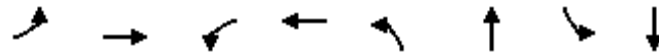
95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	89	1184	86	812	135	272	141	322
v/c Ratio	0.56	0.88	0.80	0.60	0.83	0.65	0.87	0.76
Control Delay	45.5	29.2	82.2	19.0	73.5	28.4	79.8	32.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.5	29.2	82.2	19.0	73.5	28.4	79.8	32.6
Queue Length 50th (ft)	36	231	36	138	57	89	60	105
Queue Length 95th (ft)	#77	273	#97	173	#130	136	#137	157
Internal Link Dist (ft)		2600		1278		1745		1836
Turn Bay Length (ft)	110		110		140		140	
Base Capacity (vph)	162	1396	108	1354	162	510	162	515
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.85	0.80	0.60	0.83	0.53	0.87	0.63

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	101	1063	66	1093	67	281	77	339
v/c Ratio	0.59	0.78	0.58	0.85	0.47	0.52	0.54	0.63
Control Delay	48.1	22.7	55.5	28.0	44.0	24.9	48.2	27.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.1	22.7	55.5	28.0	44.0	24.9	48.2	27.8
Queue Length 50th (ft)	43	203	29	222	29	99	33	123
Queue Length 95th (ft)	#112	276	#88	#338	#78	172	#92	#231
Internal Link Dist (ft)		2600		1278		1745		1836
Turn Bay Length (ft)	110		110		140		140	
Base Capacity (vph)	171	1530	114	1417	142	536	142	537
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.69	0.58	0.77	0.47	0.52	0.54	0.63

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Existing + Ambient + Project Conditions - AM Peak Hour
 1: Adams Street & Garfield Street

Synchro 9 Report
 4/8/2016



Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	272	175	114	1023	58	1141
v/c Ratio	0.63	0.57	0.38	0.57	0.23	0.74
Control Delay	18.5	21.9	25.2	13.1	25.1	19.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.5	21.9	25.2	13.1	25.1	19.5
Queue Length 50th (ft)	43	34	33	124	17	156
Queue Length 95th (ft)	96	79	73	216	46	#307
Internal Link Dist (ft)	1516	839		1277		1231
Turn Bay Length (ft)			50		50	
Base Capacity (vph)	669	501	636	1793	636	1552
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.35	0.18	0.57	0.09	0.74

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Existing + Ambient + Project Conditions - PM Peak Hour
 1: Adams Street & Garfield Street

Synchro 9 Report
 4/8/2016



Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	80	56	45	849	20	639
v/c Ratio	0.27	0.20	0.20	0.33	0.11	0.27
Control Delay	11.4	12.4	18.5	5.1	18.6	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.4	12.4	18.5	5.1	18.6	6.3
Queue Length 50th (ft)	6	6	8	33	4	23
Queue Length 95th (ft)	33	28	31	118	19	89
Internal Link Dist (ft)	1516	839		1277		1231
Turn Bay Length (ft)			50		50	
Base Capacity (vph)	644	642	229	2561	184	2399
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.09	0.20	0.33	0.11	0.27
Intersection Summary						

Existing + Ambient + Project Conditions - AM Peak Hour
2: Adams Street & Magnolia Avenue

Synchro 9 Report
4/8/2016



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	111	961	176	810	459	736	318	297	970
v/c Ratio	0.72	0.99	0.94	0.77	0.82	0.84	0.51	0.87	1.03
Control Delay	66.2	60.1	92.8	30.5	48.6	42.3	9.6	61.2	69.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.2	60.1	92.8	30.5	48.6	42.3	9.6	61.2	69.8
Queue Length 50th (ft)	62	276	101	188	129	210	24	164	~311
Queue Length 95th (ft)	#137	#400	#218	251	#190	#291	90	#289	#420
Internal Link Dist (ft)		1368		2600		1492			1277
Turn Bay Length (ft)	180		135		145		245	105	
Base Capacity (vph)	160	967	188	1052	584	878	625	356	944
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.99	0.94	0.77	0.79	0.84	0.51	0.83	1.03

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Existing + Ambient + Project Conditions - PM Peak Hour
2: Adams Street & Magnolia Avenue

Synchro 9 Report
4/8/2016



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	154	1414	182	1145	505	508	195	194	546
v/c Ratio	0.95	1.09	1.20	0.92	0.87	0.63	0.36	0.79	0.81
Control Delay	102.1	80.1	174.6	40.2	53.3	35.0	6.5	60.5	42.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	102.1	80.1	174.6	40.2	53.3	35.0	6.5	60.5	42.8
Queue Length 50th (ft)	89	~471	~128	322	145	136	0	107	146
Queue Length 95th (ft)	#210	#607	#257	#458	#230	189	52	#212	205
Internal Link Dist (ft)		1368		2600		1492			1277
Turn Bay Length (ft)	180		135		145		245	105	
Base Capacity (vph)	162	1300	152	1250	591	840	557	260	723
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.95	1.09	1.20	0.92	0.85	0.60	0.35	0.75	0.76

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Existing + Ambient + Project Conditions(Mitigated) - AM Peak Hour

Intersection: 2: Adams Street & Magnolia Avenue

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	TR	L	L	T	T	R
Maximum Queue (ft)	203	273	319	125	89	217	296	130	134	180	205	130
Average Queue (ft)	104	182	188	70	57	128	163	117	118	96	103	65
95th Queue (ft)	204	321	333	153	90	210	305	136	138	191	215	130
Link Distance (ft)		1346	1346			2582	2582			1467	1467	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	180			100	135			145	145			245
Storage Blk Time (%)		17	27	0		8		0	0	0		
Queuing Penalty (veh)		16	53	0		12		0	1	1		

Intersection: 2: Adams Street & Magnolia Avenue

Movement	SB	SB	SB
Directions Served	L	T	TR
Maximum Queue (ft)	129	309	242
Average Queue (ft)	128	218	184
95th Queue (ft)	130	329	251
Link Distance (ft)		1282	1282
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	105		
Storage Blk Time (%)	26	19	
Queuing Penalty (veh)	98	50	

Existing + Ambient + Project Conditions(Mitigated)- PM Peak Hour

Intersection: 2: Adams Street & Magnolia Avenue

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	TR	L	L	T	T	R
Maximum Queue (ft)	204	411	431	125	159	342	283	157	160	213	182	64
Average Queue (ft)	120	252	280	98	145	257	222	141	150	110	121	28
95th Queue (ft)	204	465	494	179	192	359	300	157	168	201	177	64
Link Distance (ft)		1346	1346			2582	2582			1467	1467	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	180			100	135			145	145			245
Storage Blk Time (%)		20	35	0	45	22		1	5			
Queuing Penalty (veh)		30	145	1	219	39		3	11			

Intersection: 2: Adams Street & Magnolia Avenue

Movement	SB	SB	SB
Directions Served	L	T	TR
Maximum Queue (ft)	129	200	174
Average Queue (ft)	121	144	143
95th Queue (ft)	143	228	186
Link Distance (ft)		1282	1282
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	105		
Storage Blk Time (%)	26	4	
Queuing Penalty (veh)	55	7	



Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	20	130	88	655	1391	12	1187
v/c Ratio	0.06	0.23	0.22	1.21	0.90	0.04	1.16
Control Delay	30.2	7.2	26.7	145.0	27.6	37.7	119.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.2	7.2	26.7	145.0	27.6	37.7	119.5
Queue Length 50th (ft)	10	3	38	~582	361	7	~523
Queue Length 95th (ft)	27	39	73	m#685	420	22	#576
Internal Link Dist (ft)		396	473		579		1492
Turn Bay Length (ft)	200			195		48	
Base Capacity (vph)	360	569	393	540	1541	300	1022
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.23	0.22	1.21	0.90	0.04	1.16

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

Existing + Ambient + Project Conditions - PM Peak Hour
 3: Adams Street & Campus View/Briarwood Drive

Synchro 9 Report
 4/8/2016



Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	72	443	49	417	1132	10	1058
v/c Ratio	0.30	0.68	0.61	0.88	0.58	0.04	0.71
Control Delay	39.9	9.9	61.5	60.7	9.0	36.1	27.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.9	9.9	61.5	60.7	9.0	36.1	27.7
Queue Length 50th (ft)	41	5	20	263	136	6	290
Queue Length 95th (ft)	82	94	#76	m#384	181	21	390
Internal Link Dist (ft)		97	247		579		1492
Turn Bay Length (ft)	200			195		48	
Base Capacity (vph)	259	670	84	528	1950	264	1490
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.66	0.58	0.79	0.58	0.04	0.71

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	659	607	261	1123	1281
v/c Ratio	0.95	0.93	0.87	0.61	0.91dr
Control Delay	53.7	51.3	65.4	14.1	8.3
Queue Delay	4.7	0.0	35.7	28.3	2.8
Total Delay	58.3	51.3	101.1	42.4	11.1
Queue Length 50th (ft)	431	387	167	247	23
Queue Length 95th (ft)	#589	#540	m#234	248	m23
Internal Link Dist (ft)	487			185	10
Turn Bay Length (ft)					
Base Capacity (vph)	707	662	315	1831	1548
Starvation Cap Reductn	0	0	65	757	0
Spillback Cap Reductn	27	0	0	0	167
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.97	0.92	1.04	1.05	0.93

Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.
- dr Defacto Right Lane. Recode with 1 though lane as a right lane.



Lane Group	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	395	365	367	864	1415
v/c Ratio	0.89	0.71	0.89	0.36	0.73
Control Delay	54.7	23.6	33.1	6.2	12.4
Queue Delay	0.1	0.0	54.0	9.0	0.9
Total Delay	54.8	23.6	87.1	15.2	13.3
Queue Length 50th (ft)	217	101	185	131	269
Queue Length 95th (ft)	#385	212	m171	m122	163
Internal Link Dist (ft)	487			185	10
Turn Bay Length (ft)					
Base Capacity (vph)	475	545	446	2376	1936
Starvation Cap Reductn	0	0	130	1474	0
Spillback Cap Reductn	2	0	0	0	251
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.84	0.67	1.16	0.96	0.84

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

	→	↘	↑	↙	↓
Lane Group	EBT	EBR	NBT	SBL	SBT
Lane Group Flow (vph)	629	639	824	317	667
v/c Ratio	0.90	0.85	0.59	0.85	0.35
Control Delay	49.0	32.4	19.9	45.2	10.1
Queue Delay	7.0	53.3	1.0	56.9	2.9
Total Delay	55.9	85.7	20.9	102.1	13.0
Queue Length 50th (ft)	388	273	148	212	164
Queue Length 95th (ft)	#625	#509	66	m253	m190
Internal Link Dist (ft)	522		75		185
Turn Bay Length (ft)					
Base Capacity (vph)	720	766	1405	420	1910
Starvation Cap Reductn	0	0	270	141	1102
Spillback Cap Reductn	64	362	324	0	20
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.96	1.58	0.76	1.14	0.83

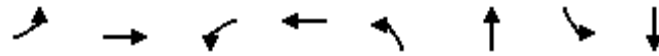
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

	→	↘	↑	↙	↓
Lane Group	EBT	EBR	NBT	SBL	SBT
Lane Group Flow (vph)	809	762	898	608	492
v/c Ratio	1.14	0.92	0.94	1.19	0.27
Control Delay	109.1	35.0	43.3	123.3	6.8
Queue Delay	0.6	49.9	45.0	0.4	0.9
Total Delay	109.7	84.9	88.2	123.7	7.7
Queue Length 50th (ft)	~606	294	165	~484	19
Queue Length 95th (ft)	#835	#561	#239	m#674	m32
Internal Link Dist (ft)	522		75		185
Turn Bay Length (ft)					
Base Capacity (vph)	710	825	955	512	1840
Starvation Cap Reductn	0	0	226	23	1035
Spillback Cap Reductn	61	416	22	0	525
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.25	1.86	1.23	1.24	0.61
Intersection Summary					
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.					
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.					
m Volume for 95th percentile queue is metered by upstream signal.					



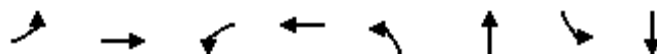
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	123	548	45	256	23	610	414	960
v/c Ratio	0.64	0.78	0.48	0.49	0.26	0.51	0.84	0.44
Control Delay	62.0	49.3	67.4	27.3	58.0	33.3	40.4	12.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.3	56.3	0.9
Total Delay	62.0	49.3	67.4	27.3	58.0	33.5	96.7	13.5
Queue Length 50th (ft)	84	189	31	47	16	187	200	145
Queue Length 95th (ft)	144	248	#70	88	43	273	m249	341
Internal Link Dist (ft)		1051		991		2587		75
Turn Bay Length (ft)	130		95		145		75	
Base Capacity (vph)	225	768	96	577	88	1194	611	2169
Starvation Cap Reductn	0	0	0	0	0	0	261	864
Spillback Cap Reductn	0	0	0	2	0	156	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.71	0.47	0.45	0.26	0.59	1.18	0.74

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

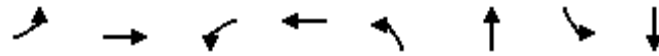
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	211	468	41	483	46	620	328	970
v/c Ratio	0.76	0.48	0.39	0.78	0.41	0.55	0.83	0.53
Control Delay	57.8	31.0	56.7	33.4	56.2	32.0	44.3	21.5
Queue Delay	0.0	0.0	0.0	0.8	0.0	1.1	59.7	2.5
Total Delay	57.8	31.0	56.7	34.1	56.2	33.1	104.0	24.0
Queue Length 50th (ft)	128	128	26	91	28	178	187	293
Queue Length 95th (ft)	197	166	58	138	63	242	m233	m337
Internal Link Dist (ft)		1051		991		2587		75
Turn Bay Length (ft)	130		95		145		75	
Base Capacity (vph)	318	1003	106	691	114	1125	460	1814
Starvation Cap Reductn	0	0	0	0	0	0	217	686
Spillback Cap Reductn	1	0	0	52	0	272	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.67	0.47	0.39	0.76	0.40	0.73	1.35	0.86

Intersection Summary

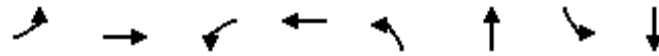
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	153	257	5	412	16	570	158	267
v/c Ratio	0.81	0.22	0.04	0.57	0.13	0.50	0.83	0.16
Control Delay	60.3	14.3	26.5	15.3	28.2	17.6	64.1	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.3	14.3	26.5	15.3	28.2	17.6	64.1	7.8
Queue Length 50th (ft)	51	29	2	38	5	77	52	16
Queue Length 95th (ft)	#123	54	9	59	19	113	#128	42
Internal Link Dist (ft)		1221		1308		1386		2587
Turn Bay Length (ft)	120		140		150		200	
Base Capacity (vph)	190	1336	126	1240	126	1137	190	1648
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.81	0.19	0.04	0.33	0.13	0.50	0.83	0.16

Intersection Summary

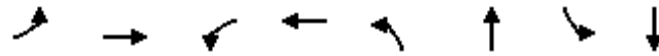
95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	68	195	15	432	5	211	159	544
v/c Ratio	0.40	0.20	0.11	0.55	0.04	0.17	0.52	0.30
Control Delay	35.4	14.6	30.0	20.2	28.8	16.9	29.6	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.4	14.6	30.0	20.2	28.8	16.9	29.6	9.3
Queue Length 50th (ft)	24	22	5	64	2	29	52	46
Queue Length 95th (ft)	#58	46	20	92	10	53	100	98
Internal Link Dist (ft)		1221		1308		1386		2587
Turn Bay Length (ft)	120		140		150		200	
Base Capacity (vph)	170	1314	136	1155	136	1215	375	1797
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.15	0.11	0.37	0.04	0.17	0.42	0.30

Intersection Summary

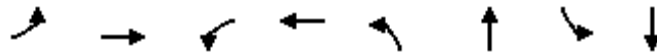
95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	152	1113	98	817	106	658	139	471
v/c Ratio	0.67	0.83	0.73	0.79	0.66	0.76	0.87	0.47
Control Delay	45.2	26.8	65.9	27.2	53.6	28.5	79.5	20.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.2	26.8	65.9	27.2	53.6	28.5	79.5	20.1
Queue Length 50th (ft)	64	228	43	158	45	127	61	77
Queue Length 95th (ft)	#122	273	#105	198	#103	164	#142	107
Internal Link Dist (ft)		940		1530		2241		2375
Turn Bay Length (ft)	170		110		150		125	
Base Capacity (vph)	241	1335	134	1121	160	966	160	1018
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.63	0.83	0.73	0.73	0.66	0.68	0.87	0.46

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	148	1545	80	1223	92	374	104	609
v/c Ratio	0.81	0.97	0.76	0.91	0.70	0.51	0.79	0.68
Control Delay	65.0	39.2	78.1	32.8	62.7	25.4	74.8	22.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.0	39.2	78.1	32.8	62.7	25.4	74.8	22.2
Queue Length 50th (ft)	64	~391	35	256	40	70	45	93
Queue Length 95th (ft)	#160	#523	#107	#395	#112	108	#127	147
Internal Link Dist (ft)		940		1530		2241		2375
Turn Bay Length (ft)	170		110		150		125	
Base Capacity (vph)	183	1585	105	1356	131	838	131	926
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.81	0.97	0.76	0.90	0.70	0.45	0.79	0.66

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	42	1308	113	790	35	226
v/c Ratio	0.10	0.55	0.54	0.33	0.09	0.49
Control Delay	5.6	6.9	21.5	5.3	16.6	19.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.6	6.9	21.5	5.3	16.6	19.6
Queue Length 50th (ft)	4	97	17	48	7	49
Queue Length 95th (ft)	18	197	#105	101	28	118
Internal Link Dist (ft)		1530		999	321	2410
Turn Bay Length (ft)	110		110			
Base Capacity (vph)	508	2792	246	2822	764	818
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.47	0.46	0.28	0.05	0.28

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	36	1531	17	1253	34	34
v/c Ratio	0.11	0.49	0.07	0.40	0.09	0.09
Control Delay	2.9	2.8	2.9	2.4	16.2	13.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.9	2.8	2.9	2.4	16.2	13.0
Queue Length 50th (ft)	0	0	0	0	2	1
Queue Length 95th (ft)	10	142	6	102	29	24
Internal Link Dist (ft)		1530		999	321	2410
Turn Bay Length (ft)	110		110			
Base Capacity (vph)	351	3207	257	3210	1040	991
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.48	0.07	0.39	0.03	0.03
Intersection Summary						



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	122	1176	139	553	225	331	219	151	471
v/c Ratio	0.61	0.93	0.93	0.48	0.97	0.69	0.39	0.72	1.02
Control Delay	50.6	41.5	100.7	25.7	92.5	39.2	6.3	58.0	81.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.6	41.5	100.7	25.7	92.5	39.2	6.3	58.0	81.6
Queue Length 50th (ft)	66	328	80	128	129	173	0	83	~274
Queue Length 95th (ft)	101	330	#152	148	#211	218	31	123	#363
Internal Link Dist (ft)		999		1167		2219			326
Turn Bay Length (ft)	105		115		150		150	150	
Base Capacity (vph)	235	1275	149	1146	233	483	560	225	462
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.92	0.93	0.48	0.97	0.69	0.39	0.67	1.02

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	92	1484	185	1193	98	348	126	93	458
v/c Ratio	0.61	0.98	0.99	0.72	1.02	0.82	0.28	0.83	1.04
Control Delay	56.6	45.3	105.9	23.2	143.2	51.2	7.4	92.6	88.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.6	45.3	105.9	23.2	143.2	51.2	7.4	92.6	88.9
Queue Length 50th (ft)	51	423	107	291	~58	189	0	53	~280
Queue Length 95th (ft)	#105	#567	#232	360	#154	#318	41	#136	#452
Internal Link Dist (ft)		999		1167		2219			326
Turn Bay Length (ft)	105		115		150		150	150	
Base Capacity (vph)	162	1515	187	1657	96	422	444	112	440
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.98	0.99	0.72	1.02	0.82	0.28	0.83	1.04

Intersection Summary

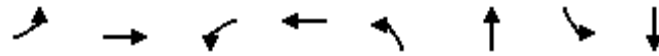
- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

					
Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1065	101	659	39	19
v/c Ratio	0.71	0.43	0.32	0.08	0.04
Control Delay	18.0	35.2	6.7	22.5	11.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	18.0	35.2	6.7	22.5	11.4
Queue Length 50th (ft)	177	38	59	12	0
Queue Length 95th (ft)	250	94	81	40	16
Internal Link Dist (ft)	1167		1368	223	
Turn Bay Length (ft)		160		100	
Base Capacity (vph)	2171	302	2906	511	470
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.49	0.33	0.23	0.08	0.04
Intersection Summary					

	→	↙	←	↖	↗
Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1434	69	1315	144	71
v/c Ratio	0.80	0.36	0.58	0.34	0.16
Control Delay	18.1	38.1	7.7	29.4	8.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	18.1	38.1	7.7	29.4	8.5
Queue Length 50th (ft)	265	31	137	60	0
Queue Length 95th (ft)	356	72	180	116	33
Internal Link Dist (ft)	1167		1368	223	
Turn Bay Length (ft)		160		100	
Base Capacity (vph)	2247	229	2795	422	432
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.64	0.30	0.47	0.34	0.16
Intersection Summary					

Existing + Ambient + Project Conditions - AM Peak Hour
 14: Jefferson Street & Magnolia Avenue

Synchro 9 Report
 4/8/2016



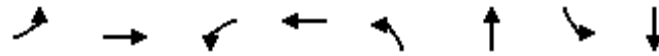
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	89	1194	86	865	135	272	141	322
v/c Ratio	0.56	0.89	0.80	0.64	0.84	0.65	0.88	0.76
Control Delay	45.6	29.7	82.5	19.8	73.7	28.4	80.0	32.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.6	29.7	82.5	19.8	73.7	28.4	80.0	32.6
Queue Length 50th (ft)	36	234	36	152	57	89	60	105
Queue Length 95th (ft)	#77	277	#97	188	#130	136	#137	157
Internal Link Dist (ft)		2600		1278		1745		1836
Turn Bay Length (ft)	110		110		140		140	
Base Capacity (vph)	161	1394	108	1356	161	509	161	515
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.86	0.80	0.64	0.84	0.53	0.88	0.63

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Existing + Ambient + Project Conditions - PM Peak Hour
14: Jefferson Street & Magnolia Avenue

Synchro 9 Report
4/8/2016



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	101	1095	66	1125	67	281	77	339
v/c Ratio	0.93	0.73	0.61	0.81	0.61	0.58	0.71	0.69
Control Delay	106.9	19.8	57.9	22.8	58.7	26.8	68.8	31.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	106.9	19.8	57.9	22.8	58.7	26.8	68.8	31.3
Queue Length 50th (ft)	45	200	29	208	29	101	34	126
Queue Length 95th (ft)	#135	272	#88	284	#89	176	#103	#244
Internal Link Dist (ft)		2600		1278		1745		1836
Turn Bay Length (ft)	110		110		140		140	
Base Capacity (vph)	109	1578	109	1576	109	488	109	488
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.93	0.69	0.61	0.71	0.61	0.58	0.71	0.69

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	272	179	114	1024	58	1141
v/c Ratio	0.63	0.64	0.50	0.53	0.29	0.66
Control Delay	16.5	24.1	31.7	11.1	27.4	14.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.5	24.1	31.7	11.1	27.4	14.5
Queue Length 50th (ft)	36	33	34	113	17	139
Queue Length 95th (ft)	79	74	76	185	46	222
Internal Link Dist (ft)	1516	839		1277		1231
Turn Bay Length (ft)			50		50	
Base Capacity (vph)	640	437	240	1923	206	1733
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.41	0.47	0.53	0.28	0.66
Intersection Summary						



Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	80	59	45	851	20	652
v/c Ratio	0.24	0.17	0.19	0.30	0.10	0.24
Control Delay	10.5	11.7	18.0	4.1	18.2	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.5	11.7	18.0	4.1	18.2	5.4
Queue Length 50th (ft)	4	4	5	0	2	0
Queue Length 95th (ft)	33	30	32	118	19	91
Internal Link Dist (ft)	1516	839		1277		1231
Turn Bay Length (ft)			50		50	
Base Capacity (vph)	933	983	241	2865	193	2704
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.06	0.19	0.30	0.10	0.24
Intersection Summary						



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	111	982	178	822	461	738	318	300	972
v/c Ratio	0.72	1.02	0.95	0.78	0.82	0.84	0.51	0.88	1.03
Control Delay	66.2	65.4	95.2	31.1	48.9	42.6	9.7	62.0	70.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.2	65.4	95.2	31.1	48.9	42.6	9.7	62.0	70.4
Queue Length 50th (ft)	62	~294	102	193	130	211	25	166	~313
Queue Length 95th (ft)	#137	#413	#222	257	#191	#292	91	#293	#421
Internal Link Dist (ft)		1368		2600		1492			1277
Turn Bay Length (ft)	180		135		145		245	105	
Base Capacity (vph)	160	967	188	1052	584	875	623	356	944
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.69	1.02	0.95	0.78	0.79	0.84	0.51	0.84	1.03

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	154	1448	182	1181	513	515	199	202	553
v/c Ratio	0.96	1.12	1.21	0.95	0.88	0.66	0.37	0.78	0.82
Control Delay	102.8	91.0	175.7	44.5	54.6	36.4	6.7	57.6	43.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	102.8	91.0	175.7	44.5	54.6	36.4	6.7	57.6	43.4
Queue Length 50th (ft)	89	~494	~128	337	147	141	0	111	149
Queue Length 95th (ft)	#210	#630	#257	#482	#236	195	53	#212	#212
Internal Link Dist (ft)		1368		2600		1492			1277
Turn Bay Length (ft)	180		135		145		245	105	
Base Capacity (vph)	161	1297	151	1247	589	798	542	279	721
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	1.12	1.21	0.95	0.87	0.65	0.37	0.72	0.77

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	22	140	88	659	1396	12	1198
v/c Ratio	0.07	0.28	0.28	1.34	0.76	0.05	0.90
Control Delay	40.1	8.5	37.2	199.3	26.0	47.6	48.0
Queue Delay	0.0	0.0	0.0	0.0	0.4	0.0	0.0
Total Delay	40.1	8.5	37.2	199.3	26.5	47.6	48.0
Queue Length 50th (ft)	15	3	51	~747	445	9	482
Queue Length 95th (ft)	35	44	91	m#872	466	26	510
Internal Link Dist (ft)		585	247		579		1492
Turn Bay Length (ft)	200			195		48	
Base Capacity (vph)	301	508	317	492	1847	254	1375
Starvation Cap Reductn	0	0	0	0	129	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.28	0.28	1.34	0.81	0.05	0.87

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	73	453	49	444	1155	10	1063
v/c Ratio	0.28	0.67	0.55	0.89	0.61	0.04	0.76
Control Delay	38.9	9.5	52.5	61.3	9.2	36.1	30.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.9	9.5	52.5	61.3	9.2	36.1	30.8
Queue Length 50th (ft)	41	5	19	277	147	6	312
Queue Length 95th (ft)	83	95	#73	m#407	183	21	400
Internal Link Dist (ft)		97	247		579		1492
Turn Bay Length (ft)	200			195		48	
Base Capacity (vph)	259	678	89	545	1908	264	1400
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.67	0.55	0.81	0.61	0.04	0.76

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	663	609	261	1129	1313
v/c Ratio	0.95	0.92	0.90	0.62	0.94dr
Control Delay	58.7	52.1	72.4	19.3	16.4
Queue Delay	46.0	0.0	54.6	2.9	0.6
Total Delay	104.7	52.1	126.9	22.2	17.0
Queue Length 50th (ft)	532	458	204	261	291
Queue Length 95th (ft)	#682	#574	m#281	202	240
Internal Link Dist (ft)	487			185	10
Turn Bay Length (ft)					
Base Capacity (vph)	714	679	304	1831	1577
Starvation Cap Reductn	0	0	84	568	0
Spillback Cap Reductn	156	0	0	0	65
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.19	0.90	1.19	0.89	0.87

Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.
- dr Defacto Right Lane. Recode with 1 though lane as a right lane.



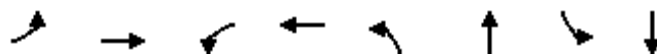
Lane Group	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	395	372	374	907	1468
v/c Ratio	0.91	0.73	0.89	0.39	0.87dr
Control Delay	58.5	26.3	32.2	7.3	12.6
Queue Delay	0.1	0.0	53.5	25.4	1.6
Total Delay	58.6	26.3	85.7	32.7	14.2
Queue Length 50th (ft)	232	117	195	155	112
Queue Length 95th (ft)	#408	232	m173	m136	178
Internal Link Dist (ft)	487			185	10
Turn Bay Length (ft)					
Base Capacity (vph)	460	533	446	2352	1898
Starvation Cap Reductn	0	0	131	1473	0
Spillback Cap Reductn	1	0	0	0	253
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.86	0.70	1.19	1.03	0.89

Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.
- dr Defacto Right Lane. Recode with 1 though lane as a right lane.

	→	↘	↑	↙	↓
Lane Group	EBT	EBR	NBT	SBL	SBT
Lane Group Flow (vph)	629	641	829	319	686
v/c Ratio	0.91	0.86	0.57	0.84	0.35
Control Delay	55.6	35.9	24.0	67.7	7.7
Queue Delay	8.3	56.0	0.7	56.5	1.0
Total Delay	63.9	91.8	24.7	124.1	8.7
Queue Length 50th (ft)	464	326	196	264	87
Queue Length 95th (ft)	#735	#587	112	m300	m89
Internal Link Dist (ft)	522		75		185
Turn Bay Length (ft)					
Base Capacity (vph)	707	761	1453	470	1989
Starvation Cap Reductn	0	0	303	179	991
Spillback Cap Reductn	60	453	150	0	278
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.97	2.08	0.72	1.10	0.69
Intersection Summary					
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.					
m Volume for 95th percentile queue is metered by upstream signal.					

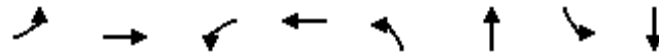
	→	↘	↑	↙	↓
Lane Group	EBT	EBR	NBT	SBL	SBT
Lane Group Flow (vph)	809	765	958	613	506
v/c Ratio	1.14	0.94	1.01	1.20	0.28
Control Delay	109.1	37.4	59.9	126.2	6.3
Queue Delay	0.7	48.9	32.2	0.5	1.0
Total Delay	109.8	86.3	92.1	126.6	7.3
Queue Length 50th (ft)	~606	306	~120	~487	21
Queue Length 95th (ft)	#835	#574	#199	m#667	m33
Internal Link Dist (ft)	522		75		185
Turn Bay Length (ft)					
Base Capacity (vph)	710	818	944	512	1840
Starvation Cap Reductn	0	0	220	28	1036
Spillback Cap Reductn	67	405	27	0	663
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.26	1.85	1.32	1.27	0.63
Intersection Summary					
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.					
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.					
m Volume for 95th percentile queue is metered by upstream signal.					



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	123	551	46	258	23	615	414	980
v/c Ratio	0.67	0.81	0.43	0.47	0.28	0.48	0.86	0.45
Control Delay	73.9	59.2	70.8	30.4	68.3	36.3	57.5	15.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.3	56.5	0.6
Total Delay	73.9	59.2	70.8	30.4	68.3	36.6	114.0	16.2
Queue Length 50th (ft)	101	230	38	56	19	218	329	270
Queue Length 95th (ft)	166	292	80	100	50	314	m431	340
Internal Link Dist (ft)		1051		991		2587		75
Turn Bay Length (ft)	130		95		145		75	
Base Capacity (vph)	217	757	122	629	85	1276	599	2162
Starvation Cap Reductn	0	0	0	0	0	0	261	746
Spillback Cap Reductn	0	0	0	3	0	205	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.73	0.38	0.41	0.27	0.57	1.22	0.69

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



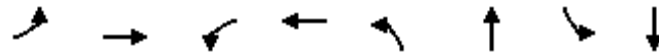
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	211	473	45	489	51	688	328	985
v/c Ratio	0.78	0.49	0.43	0.78	0.43	0.60	0.83	0.57
Control Delay	60.2	31.4	58.5	33.9	56.0	32.4	44.8	25.2
Queue Delay	1.9	0.0	0.0	1.8	0.0	0.6	60.1	10.2
Total Delay	62.1	31.4	58.5	35.7	56.0	33.0	104.9	35.4
Queue Length 50th (ft)	128	129	28	93	32	204	194	300
Queue Length 95th (ft)	#210	171	63	141	67	264	m235	m341
Internal Link Dist (ft)		1051		991		2587		75
Turn Bay Length (ft)	130		95		145		75	
Base Capacity (vph)	300	978	106	690	124	1141	442	1734
Starvation Cap Reductn	0	0	0	0	0	0	215	723
Spillback Cap Reductn	24	0	0	88	0	161	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.48	0.42	0.81	0.41	0.70	1.44	0.97

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

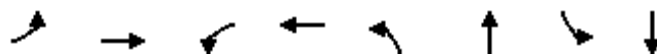
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	153	258	5	413	20	575	158	293
v/c Ratio	0.82	0.23	0.03	0.57	0.11	0.49	0.85	0.18
Control Delay	63.6	15.3	25.0	15.8	26.2	17.3	67.7	8.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.6	15.3	25.0	15.8	26.2	17.3	67.7	8.5
Queue Length 50th (ft)	52	30	2	40	6	78	54	18
Queue Length 95th (ft)	#126	58	9	61	21	114	#131	49
Internal Link Dist (ft)		1221		1308		1386		2587
Turn Bay Length (ft)	120		140		150		200	
Base Capacity (vph)	186	1184	186	1164	186	1177	186	1660
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.22	0.03	0.35	0.11	0.49	0.85	0.18

Intersection Summary

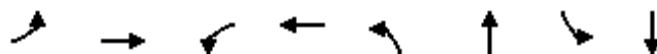
95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	68	209	15	433	6	286	159	558
v/c Ratio	0.54	0.20	0.12	0.57	0.05	0.25	0.64	0.31
Control Delay	45.9	13.8	29.2	20.6	27.8	15.9	39.7	9.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.9	13.8	29.2	20.6	27.8	15.9	39.7	9.5
Queue Length 50th (ft)	23	23	5	62	2	37	53	45
Queue Length 95th (ft)	#68	47	20	88	11	64	#119	100
Internal Link Dist (ft)		1221		1308		1386		2587
Turn Bay Length (ft)	120		140		150		200	
Base Capacity (vph)	127	1248	127	1209	127	1147	255	1778
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.17	0.12	0.36	0.05	0.25	0.62	0.31

Intersection Summary

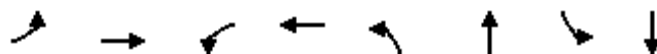
95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	152	1141	98	830	106	658	139	471
v/c Ratio	0.67	0.81	0.74	0.75	0.67	0.82	0.87	0.50
Control Delay	45.8	24.3	66.8	24.4	54.2	33.4	81.0	21.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.8	24.3	66.8	24.4	54.2	33.4	81.0	21.8
Queue Length 50th (ft)	64	224	43	155	45	133	61	81
Queue Length 95th (ft)	#122	268	#105	193	#103	172	#142	113
Internal Link Dist (ft)		940		1530		2241		2375
Turn Bay Length (ft)	170		110		150		125	
Base Capacity (vph)	239	1424	133	1215	159	856	159	937
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.80	0.74	0.68	0.67	0.77	0.87	0.50

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	148	1611	80	1280	92	374	104	609
v/c Ratio	0.80	1.03	0.75	0.97	0.87	0.48	0.98	0.71
Control Delay	63.3	53.2	76.4	41.7	96.3	23.5	123.1	22.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.3	53.2	76.4	41.7	96.3	23.5	123.1	22.5
Queue Length 50th (ft)	61	~409	33	266	39	66	44	88
Queue Length 95th (ft)	#160	#570	#107	#437	#123	103	#139	140
Internal Link Dist (ft)		940		1530		2241		2375
Turn Bay Length (ft)	170		110		150		125	
Base Capacity (vph)	185	1566	106	1320	106	952	106	1016
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.80	1.03	0.75	0.97	0.87	0.39	0.98	0.60

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	42	1333	113	803	35	226
v/c Ratio	0.10	0.56	0.55	0.33	0.09	0.50
Control Delay	5.2	6.6	21.7	5.0	17.4	20.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.2	6.6	21.7	5.0	17.4	20.5
Queue Length 50th (ft)	4	95	16	47	7	45
Queue Length 95th (ft)	16	183	#103	93	29	125
Internal Link Dist (ft)		1530		999	321	2410
Turn Bay Length (ft)	110		110			
Base Capacity (vph)	520	2888	247	2920	672	730
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.46	0.46	0.28	0.05	0.31

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	36	1578	17	1291	34	34
v/c Ratio	0.11	0.51	0.07	0.41	0.09	0.09
Control Delay	3.1	2.9	2.9	2.4	16.1	12.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.1	2.9	2.9	2.4	16.1	12.8
Queue Length 50th (ft)	0	0	0	0	2	1
Queue Length 95th (ft)	10	151	6	106	28	24
Internal Link Dist (ft)		1530		999	321	2410
Turn Bay Length (ft)	110		110			
Base Capacity (vph)	330	3154	249	3156	1145	1089
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.50	0.07	0.41	0.03	0.03
Intersection Summary						



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	125	1210	139	563	227	331	219	151	474
v/c Ratio	0.60	0.95	0.93	0.50	0.98	0.69	0.39	0.72	1.03
Control Delay	48.9	44.8	101.4	26.4	95.2	39.4	6.3	58.2	84.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.9	44.8	101.4	26.4	95.2	39.4	6.3	58.2	84.7
Queue Length 50th (ft)	68	343	80	132	130	173	0	83	~286
Queue Length 95th (ft)	102	343	#152	154	#215	218	31	123	#367
Internal Link Dist (ft)		999		1167		2219			326
Turn Bay Length (ft)	105		115		150		150	150	
Base Capacity (vph)	252	1272	149	1131	232	481	559	224	460
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.95	0.93	0.50	0.98	0.69	0.39	0.67	1.03

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	98	1530	185	1225	105	348	126	93	458
v/c Ratio	0.70	1.01	0.99	0.73	0.91	0.82	0.28	0.83	1.09
Control Delay	66.8	52.7	105.9	22.8	105.9	51.2	7.4	92.6	105.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.8	52.7	105.9	22.8	105.9	51.2	7.4	92.6	105.9
Queue Length 50th (ft)	55	~455	107	296	61	189	0	53	~293
Queue Length 95th (ft)	#125	#596	#232	366	#154	#318	41	#136	#465
Internal Link Dist (ft)		999		1167		2219			326
Turn Bay Length (ft)	105		115		150		150	150	
Base Capacity (vph)	144	1514	187	1687	116	422	444	112	419
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.68	1.01	0.99	0.73	0.91	0.82	0.28	0.83	1.09

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



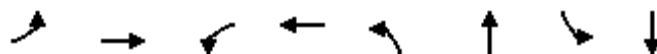
Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1469	76	1344	145	72
v/c Ratio	0.94	0.65	0.69	0.27	0.13
Control Delay	29.5	56.1	11.5	17.6	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	29.5	56.1	11.5	17.6	5.4
Queue Length 50th (ft)	254	28	158	40	0
Queue Length 95th (ft)	#409	#86	221	79	24
Internal Link Dist (ft)	1167		1368	223	
Turn Bay Length (ft)		160		100	
Base Capacity (vph)	1571	117	2067	547	539
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.94	0.65	0.65	0.27	0.13

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.



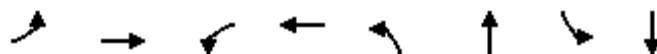
Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1085	103	667	40	20
v/c Ratio	0.67	0.38	0.29	0.14	0.07
Control Delay	11.5	24.3	3.4	20.2	10.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	11.5	24.3	3.4	20.2	10.7
Queue Length 50th (ft)	105	26	25	10	0
Queue Length 95th (ft)	170	68	46	32	15
Internal Link Dist (ft)	1167		1368	223	
Turn Bay Length (ft)		160		100	
Base Capacity (vph)	2134	294	2823	696	634
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.51	0.35	0.24	0.06	0.03
Intersection Summary					



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	90	1216	86	875	139	274	141	324
v/c Ratio	0.59	0.88	0.84	0.63	0.91	0.63	0.92	0.74
Control Delay	49.0	28.3	92.3	19.3	89.1	28.8	91.9	33.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.0	28.3	92.3	19.3	89.1	28.8	91.9	33.3
Queue Length 50th (ft)	38	241	38	154	61	94	62	111
Queue Length 95th (ft)	#79	269	#97	181	#134	143	#137	166
Internal Link Dist (ft)		2600		1278		1745		1836
Turn Bay Length (ft)	110		110		140		140	
Base Capacity (vph)	153	1422	102	1385	153	433	153	439
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.86	0.84	0.63	0.91	0.63	0.92	0.74

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	102	1144	66	1151	78	285	77	344
v/c Ratio	0.60	0.83	0.58	0.89	0.55	0.54	0.55	0.65
Control Delay	49.0	25.1	56.3	30.8	49.2	25.2	48.8	28.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.0	25.1	56.3	30.8	49.2	25.2	48.8	28.5
Queue Length 50th (ft)	44	226	29	241	33	101	33	125
Queue Length 95th (ft)	#113	#321	#88	#369	#92	175	#92	#238
Internal Link Dist (ft)		2600		1278		1745		1836
Turn Bay Length (ft)	110		110		140		140	
Base Capacity (vph)	169	1512	113	1400	141	530	141	531
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.76	0.58	0.82	0.55	0.54	0.55	0.65

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.



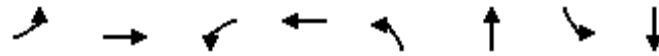
Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	301	216	145	1554	72	1651
v/c Ratio	0.55	0.55	0.59	0.59	0.45	0.73
Control Delay	14.1	19.5	42.2	5.1	37.4	18.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.1	19.5	42.2	5.1	37.4	18.1
Queue Length 50th (ft)	45	46	93	123	28	204
Queue Length 95th (ft)	96	95	m94	m111	59	230
Internal Link Dist (ft)	1516	839		1277		1231
Turn Bay Length (ft)			50		50	
Base Capacity (vph)	547	392	272	2655	163	2268
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.55	0.53	0.59	0.44	0.73

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



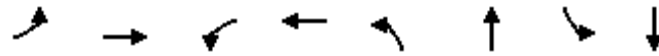
Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	92	61	51	1255	31	938
v/c Ratio	0.30	0.17	0.22	0.34	0.17	0.27
Control Delay	11.3	3.3	19.3	4.8	19.8	5.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.3	3.3	19.3	4.8	19.8	5.9
Queue Length 50th (ft)	6	0	8	35	5	24
Queue Length 95th (ft)	36	13	35	113	26	85
Internal Link Dist (ft)	1516	839		1277		1231
Turn Bay Length (ft)			50		50	
Base Capacity (vph)	792	868	228	3674	182	3446
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.07	0.22	0.34	0.17	0.27
Intersection Summary						



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	159	1284	170	1091	557	1330	432	1227
v/c Ratio	0.93	1.09	1.10	0.95	0.96	1.12	1.10	0.88
Control Delay	109.9	95.9	154.1	55.9	82.5	109.7	107.8	56.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	109.9	95.9	154.1	55.9	82.5	109.7	107.8	56.4
Queue Length 50th (ft)	135	~634	~162	430	242	~456	~392	398
Queue Length 95th (ft)	#263	#746	#300	#549	#343	#533	#583	438
Internal Link Dist (ft)		1368		2600		1492		1277
Turn Bay Length (ft)	180		135		145		105	
Base Capacity (vph)	171	1174	155	1147	578	1185	394	1396
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.93	1.09	1.10	0.95	0.96	1.12	1.10	0.88

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	204	1867	184	1561	612	857	286	694
v/c Ratio	0.96	1.06	1.10	0.94	1.08	1.13	1.10	1.12
Control Delay	90.8	44.7	157.1	50.3	118.4	126.2	143.6	127.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	90.8	44.7	157.1	50.3	118.4	126.2	143.6	127.5
Queue Length 50th (ft)	193	~1028	~202	750	~343	~339	~317	~273
Queue Length 95th (ft)	m188	m#691	#365	#918	#467	#435	#508	#364
Internal Link Dist (ft)		1368		2600		1492		1277
Turn Bay Length (ft)	180		135		145		105	
Base Capacity (vph)	212	1756	168	1653	566	761	259	622
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	1.06	1.10	0.94	1.08	1.13	1.10	1.12

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	106	156	34	1602	110	1286
v/c Ratio	0.23	0.36	0.09	1.19	0.33	1.04
Control Delay	23.4	27.7	31.9	121.0	37.6	69.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.4	27.7	31.9	121.0	37.6	69.8
Queue Length 50th (ft)	42	70	18	~629	61	~468
Queue Length 95th (ft)	77	115	m36	#671	103	#522
Internal Link Dist (ft)	585	247		579		1492
Turn Bay Length (ft)			195		48	
Base Capacity (vph)	458	429	379	1343	330	1235
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.36	0.09	1.19	0.33	1.04

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	202	97	41	1312	11	1227
v/c Ratio	0.54	0.29	0.12	0.87	0.03	0.82
Control Delay	28.4	21.4	32.6	21.9	26.2	25.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.4	21.4	32.6	21.9	26.2	25.9
Queue Length 50th (ft)	72	28	18	306	4	273
Queue Length 95th (ft)	139	68	m43	#445	18	360
Internal Link Dist (ft)	97	247		579		1492
Turn Bay Length (ft)			195		48	
Base Capacity (vph)	373	339	330	1500	330	1494
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.29	0.12	0.87	0.03	0.82

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	564	522	313	1217	892	639
v/c Ratio	0.87	0.85	0.74	0.45	0.48	0.65
Control Delay	42.3	39.0	48.2	15.8	9.3	8.4
Queue Delay	0.4	0.0	0.0	1.1	0.0	0.0
Total Delay	42.7	39.0	48.2	16.8	9.3	8.4
Queue Length 50th (ft)	313	270	81	149	42	100
Queue Length 95th (ft)	405	362	123	161	41	97
Internal Link Dist (ft)	487			185	10	
Turn Bay Length (ft)						
Base Capacity (vph)	701	663	433	2716	1861	984
Starvation Cap Reductn	0	0	0	1157	0	0
Spillback Cap Reductn	14	0	0	0	26	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.79	0.72	0.78	0.49	0.65
Intersection Summary						



Lane Group	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	337	312	443	969	907	629
v/c Ratio	0.79	0.69	0.76	0.28	0.41	0.60
Control Delay	36.8	22.6	31.6	6.7	8.0	4.8
Queue Delay	0.0	0.0	0.2	0.8	0.0	0.0
Total Delay	36.8	22.6	31.8	7.5	8.0	4.8
Queue Length 50th (ft)	130	76	88	74	47	0
Queue Length 95th (ft)	222	162	m121	m120	98	296
Internal Link Dist (ft)	487			185	10	
Turn Bay Length (ft)						
Base Capacity (vph)	500	520	610	3427	2250	1050
Starvation Cap Reductn	0	0	10	2029	0	0
Spillback Cap Reductn	0	0	0	0	111	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.67	0.60	0.74	0.69	0.42	0.60

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

	→	↘	↑	↙	↓
Lane Group	EBT	EBR	NBT	SBL	SBT
Lane Group Flow (vph)	480	606	1181	298	862
v/c Ratio	0.73	0.91	0.76	0.87	0.31
Control Delay	34.0	43.1	16.0	57.6	7.7
Queue Delay	0.0	50.7	0.2	4.4	0.2
Total Delay	34.0	93.9	16.1	61.9	7.9
Queue Length 50th (ft)	247	286	67	116	64
Queue Length 95th (ft)	363	#499	#85	m#290	69
Internal Link Dist (ft)	522		75		185
Turn Bay Length (ft)					
Base Capacity (vph)	709	706	1558	363	2790
Starvation Cap Reductn	0	0	42	28	1062
Spillback Cap Reductn	0	225	0	0	118
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.68	1.26	0.78	0.89	0.50
Intersection Summary					
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.					
m Volume for 95th percentile queue is metered by upstream signal.					

	→	↘	↑	↙	↓
Lane Group	EBT	EBR	NBT	SBL	SBT
Lane Group Flow (vph)	678	710	721	538	591
v/c Ratio	0.97	0.90	0.69	1.09	0.23
Control Delay	55.1	32.6	10.0	86.0	5.5
Queue Delay	0.5	47.7	1.7	0.0	0.1
Total Delay	55.6	80.3	11.6	86.0	5.6
Queue Length 50th (ft)	325	217	19	~311	16
Queue Length 95th (ft)	#590	#478	m30	#452	27
Internal Link Dist (ft)	522		75		185
Turn Bay Length (ft)					
Base Capacity (vph)	698	786	1227	495	2796
Starvation Cap Reductn	0	0	322	0	0
Spillback Cap Reductn	2	190	1	0	908
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.97	1.19	0.80	1.09	0.31
Intersection Summary					
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.					
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.					
m Volume for 95th percentile queue is metered by upstream signal.					



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	176	835	66	374	33	824	582	1220	165
v/c Ratio	0.63	0.99	0.94	0.70	0.32	0.77	0.94	0.44	0.18
Control Delay	52.1	66.6	143.1	31.9	53.4	42.7	49.1	12.5	1.7
Queue Delay	0.2	0.0	0.0	0.0	0.0	0.0	49.1	0.9	0.8
Total Delay	52.4	66.6	143.1	31.9	53.4	42.7	98.2	13.4	2.5
Queue Length 50th (ft)	106	277	43	71	21	182	301	149	2
Queue Length 95th (ft)	#227	#410	#128	116	52	231	m#533	204	m16
Internal Link Dist (ft)		1051		991		2587		75	
Turn Bay Length (ft)	130		95		145		75		
Base Capacity (vph)	280	845	70	657	106	1069	637	2746	930
Starvation Cap Reductn	0	0	0	0	0	0	230	1153	531
Spillback Cap Reductn	5	0	0	1	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.99	0.94	0.57	0.31	0.77	1.43	0.77	0.41

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	299	712	69	701	69	862	460	1103	241
v/c Ratio	1.04	0.64	0.63	0.85	0.43	0.85	1.06	0.57	0.32
Control Delay	100.3	26.4	63.0	31.3	42.4	39.3	87.1	22.6	4.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	20.3	17.8	1.1
Total Delay	100.3	26.4	63.0	31.3	42.4	39.3	107.4	40.4	5.8
Queue Length 50th (ft)	~164	157	34	116	33	149	~269	193	16
Queue Length 95th (ft)	#298	207	#90	#176	70	#190	m#375	m220	m21
Internal Link Dist (ft)		1051		991		2587		75	
Turn Bay Length (ft)	130		95		145		75		
Base Capacity (vph)	287	1104	110	852	177	1019	435	1921	747
Starvation Cap Reductn	0	0	0	0	0	0	156	832	302
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.04	0.64	0.63	0.82	0.39	0.85	1.65	1.01	0.54

Intersection Summary

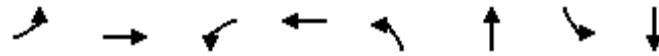
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

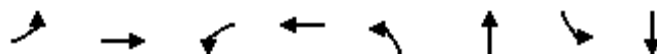
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	241	380	13	570	38	1291	228	582
v/c Ratio	0.83	0.28	0.13	0.71	0.31	0.96	0.84	0.29
Control Delay	56.0	15.2	36.8	22.7	39.9	44.0	59.3	14.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.0	15.2	36.8	22.7	39.9	44.0	59.3	14.2
Queue Length 50th (ft)	106	53	6	80	17	208	101	58
Queue Length 95th (ft)	#186	85	20	105	40	#252	#184	75
Internal Link Dist (ft)		1221		1308		1386		2587
Turn Bay Length (ft)	120		140		150		200	
Base Capacity (vph)	297	1393	99	941	123	1351	272	2037
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.81	0.27	0.13	0.61	0.31	0.96	0.84	0.29

Intersection Summary

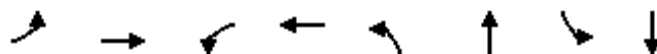
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	110	305	37	610	12	439	220	1158
v/c Ratio	0.55	0.29	0.28	0.72	0.11	0.32	0.69	0.47
Control Delay	43.6	18.2	38.8	28.2	36.3	22.2	40.6	13.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.6	18.2	38.8	28.2	36.3	22.2	40.6	13.4
Queue Length 50th (ft)	49	51	17	124	5	59	95	115
Queue Length 95th (ft)	#90	74	41	157	19	79	149	167
Internal Link Dist (ft)		1221		1308		1386		2587
Turn Bay Length (ft)	120		140		150		200	
Base Capacity (vph)	212	1219	133	1011	106	1374	372	2461
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.25	0.28	0.60	0.11	0.32	0.59	0.47

Intersection Summary

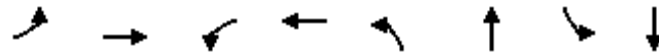
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	217	1928	120	1350	145	711	193	530
v/c Ratio	0.89	1.05	1.02	0.85	0.90	1.14	1.09	0.79
Control Delay	86.4	63.1	142.9	35.4	101.8	125.8	144.1	50.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	86.4	63.1	142.9	35.4	101.8	125.8	144.1	50.2
Queue Length 50th (ft)	167	~853	~96	476	113	~330	~168	182
Queue Length 95th (ft)	#267	#854	#198	504	#208	#397	#283	222
Internal Link Dist (ft)		940		1530		2241		2375
Turn Bay Length (ft)	170		110		150		125	
Base Capacity (vph)	250	1841	118	1581	162	621	177	671
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.87	1.05	1.02	0.85	0.90	1.14	1.09	0.79

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	220	2583	99	2033	121	396	143	726
v/c Ratio	1.10	1.15	1.41	1.02	1.29	0.89	0.93	1.16
Control Delay	151.9	100.1	299.3	57.6	240.7	84.5	123.9	132.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	151.9	100.1	299.3	57.6	240.7	84.5	123.9	132.9
Queue Length 50th (ft)	~243	~1561	~129	~1106	~150	198	142	~386
Queue Length 95th (ft)	#417	#1681	#255	#1239	#288	#291	#281	#519
Internal Link Dist (ft)		940		1530		2241		2375
Turn Bay Length (ft)	170		110		150		125	
Base Capacity (vph)	200	2247	70	1992	94	447	153	627
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.10	1.15	1.41	1.02	1.29	0.89	0.93	1.16

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	90	2079	169	1326	47	461
v/c Ratio	0.51	0.94	1.47	0.60	0.11	1.05
Control Delay	20.0	21.8	273.4	8.4	16.4	84.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.0	21.8	273.4	8.4	16.4	84.4
Queue Length 50th (ft)	17	330	~94	137	11	~193
Queue Length 95th (ft)	#81	#552	#156	185	34	#353
Internal Link Dist (ft)		1530		999	321	2410
Turn Bay Length (ft)	110		110			
Base Capacity (vph)	175	2208	115	2218	445	437
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.94	1.47	0.60	0.11	1.05

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	83	2510	21	2062	52	73
v/c Ratio	0.54	0.87	0.14	0.71	0.21	0.30
Control Delay	25.3	12.8	5.6	6.9	21.4	21.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.3	12.8	5.6	6.9	21.4	21.7
Queue Length 50th (ft)	10	298	2	170	14	19
Queue Length 95th (ft)	#87	#645	10	329	39	49
Internal Link Dist (ft)		1530		999	321	2410
Turn Bay Length (ft)	110		110			
Base Capacity (vph)	154	2896	154	2898	599	590
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.87	0.14	0.71	0.09	0.12

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	156	1818	169	870	286	312	247	156	468
v/c Ratio	0.74	1.10	1.28	0.59	1.21	0.72	0.50	0.82	1.21
Control Delay	79.0	89.7	221.1	34.2	177.4	60.5	17.7	91.6	161.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	79.0	89.7	221.1	34.2	177.4	60.5	17.7	91.6	161.5
Queue Length 50th (ft)	138	~983	~194	319	~317	267	51	140	~513
Queue Length 95th (ft)	176	#808	#277	331	#398	310	89	184	#573
Internal Link Dist (ft)		999		1167		2219			326
Turn Bay Length (ft)	105		115		150		150	150	
Base Capacity (vph)	266	1656	132	1473	236	435	496	204	387
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	1.10	1.28	0.59	1.21	0.72	0.50	0.76	1.21

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	114	2375	216	1875	125	318	136	102	443
v/c Ratio	0.96	1.24	1.21	0.92	1.34	0.90	0.37	0.91	1.18
Control Delay	139.4	145.1	187.8	38.4	260.6	87.3	21.2	131.6	156.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	139.4	145.1	187.8	38.4	260.6	87.3	21.2	131.6	156.4
Queue Length 50th (ft)	113	~1518	~256	846	~159	308	34	101	~514
Queue Length 95th (ft)	#236	#1585	#414	927	#289	#466	95	#213	#711
Internal Link Dist (ft)		999		1167		2219			326
Turn Bay Length (ft)	105		115		150		150	150	
Base Capacity (vph)	119	1914	179	2031	93	354	368	112	374
Starvation Cap Reductn	0	12	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	1.25	1.21	0.92	1.34	0.90	0.37	0.91	1.18

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1537	346	1011	37	89
v/c Ratio	0.86	0.79	0.35	0.24	0.41
Control Delay	25.2	43.5	2.4	42.4	15.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	25.2	43.5	2.4	42.4	15.2
Queue Length 50th (ft)	360	176	48	19	0
Queue Length 95th (ft)	#592	284	79	51	44
Internal Link Dist (ft)	1167		1368	223	
Turn Bay Length (ft)		160		100	
Base Capacity (vph)	1866	549	3132	336	373
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.82	0.63	0.32	0.11	0.24

Intersection Summary

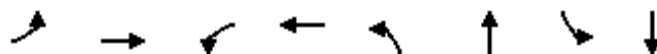
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	2170	268	2021	155	244
v/c Ratio	1.00	0.86	0.69	0.73	0.60
Control Delay	48.5	84.8	6.8	83.8	13.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	48.5	84.8	6.8	83.8	13.6
Queue Length 50th (ft)	~1179	254	345	149	0
Queue Length 95th (ft)	#1336	#372	398	#251	86
Internal Link Dist (ft)	1167		1368	223	
Turn Bay Length (ft)		160		100	
Base Capacity (vph)	2165	353	2925	212	404
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.00	0.76	0.69	0.73	0.60

Intersection Summary

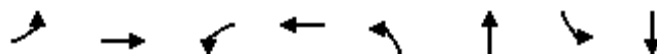
- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	100	1713	113	1176	150	288	188	325
v/c Ratio	0.57	1.04	0.96	0.74	0.96	0.85	0.96	0.85
Control Delay	52.9	59.6	117.4	23.6	104.7	56.8	96.9	52.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.9	59.6	117.4	23.6	104.7	56.8	96.9	52.4
Queue Length 50th (ft)	55	~560	65	288	87	144	108	157
Queue Length 95th (ft)	#101	#561	#143	296	#171	#228	#199	#242
Internal Link Dist (ft)		2600		1278		1745		1836
Turn Bay Length (ft)	110		110		140		140	
Base Capacity (vph)	181	1641	118	1643	157	337	196	381
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.55	1.04	0.96	0.72	0.96	0.85	0.96	0.85

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	117	1532	85	1585	74	276	96	330
v/c Ratio	0.85	0.87	0.87	0.95	0.76	0.74	0.81	0.77
Control Delay	89.1	26.8	105.4	35.6	85.8	45.2	87.9	45.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	89.1	26.8	105.4	35.6	85.8	45.2	87.9	45.3
Queue Length 50th (ft)	67	384	49	430	42	139	55	170
Queue Length 95th (ft)	#165	492	#136	#603	#117	#252	#142	#315
Internal Link Dist (ft)		2600		1278		1745		1836
Turn Bay Length (ft)	110		110		140		140	
Base Capacity (vph)	137	1759	98	1677	98	372	118	427
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.87	0.87	0.95	0.76	0.74	0.81	0.77

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



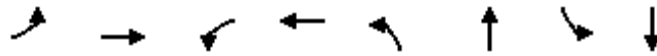
Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	301	216	145	1554	72	1651
v/c Ratio	0.64	0.72	0.61	0.57	0.35	0.68
Control Delay	15.0	26.5	37.8	11.2	29.0	14.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.0	26.5	37.8	11.2	29.0	14.0
Queue Length 50th (ft)	34	38	44	127	22	145
Queue Length 95th (ft)	79	85	#112	188	54	212
Internal Link Dist (ft)	1516	839		1277		1231
Turn Bay Length (ft)			50		50	
Base Capacity (vph)	667	446	244	2711	209	2439
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.48	0.59	0.57	0.34	0.68

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	92	61	51	1255	31	938
v/c Ratio	0.30	0.17	0.22	0.34	0.17	0.27
Control Delay	11.3	3.3	19.3	4.8	19.8	5.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.3	3.3	19.3	4.8	19.8	5.9
Queue Length 50th (ft)	6	0	8	35	5	24
Queue Length 95th (ft)	36	13	35	113	26	85
Internal Link Dist (ft)	1516	839		1277		1231
Turn Bay Length (ft)			50		50	
Base Capacity (vph)	792	868	228	3674	182	3446
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.07	0.22	0.34	0.17	0.27
Intersection Summary						



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	159	1296	170	1102	568	1330	432	1216
v/c Ratio	0.93	1.10	1.10	0.96	0.98	1.12	1.10	0.87
Control Delay	97.6	74.1	154.1	56.6	86.6	109.7	120.6	52.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	97.6	74.1	154.1	56.6	86.6	109.7	120.6	52.1
Queue Length 50th (ft)	124	~641	~162	433	248	~456	~411	354
Queue Length 95th (ft)	m#157	m#733	#300	#554	#353	#533	#598	402
Internal Link Dist (ft)		1368		2600		1492		1277
Turn Bay Length (ft)	180		135		145		105	
Base Capacity (vph)	171	1174	155	1151	578	1185	394	1396
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.93	1.10	1.10	0.96	0.98	1.12	1.10	0.87

Intersection Summary

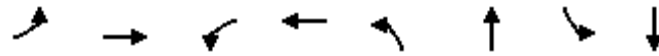
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	204	1877	184	1571	622	857	286	684
v/c Ratio	0.96	1.07	1.10	0.95	1.10	1.13	1.10	1.10
Control Delay	90.8	47.6	157.1	51.1	123.6	126.2	143.6	121.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	90.8	47.6	157.1	51.1	123.6	126.2	143.6	121.8
Queue Length 50th (ft)	193	~1042	~202	757	~354	~339	~317	~265
Queue Length 95th (ft)	m181	m637	#365	#928	#478	#435	#508	#357
Internal Link Dist (ft)		1368		2600		1492		1277
Turn Bay Length (ft)	180		135		145		105	
Base Capacity (vph)	212	1755	168	1654	566	761	259	623
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	1.07	1.10	0.95	1.10	1.13	1.10	1.10

Intersection Summary

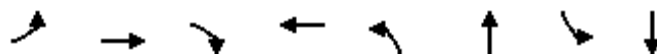
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

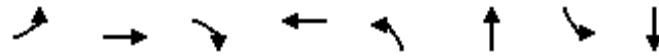
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	22	5	136	156	659	1614	24	1364
v/c Ratio	0.08	0.01	0.29	0.46	0.85	0.87	0.09	0.62
Control Delay	45.7	45.5	9.1	48.8	58.9	32.9	54.0	30.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0
Total Delay	45.7	45.5	9.1	48.8	58.9	33.3	54.0	30.5
Queue Length 50th (ft)	15	3	0	108	277	607	18	317
Queue Length 95th (ft)	41	15	45	189	332	604	46	382
Internal Link Dist (ft)		585		247		579		1492
Turn Bay Length (ft)	200				195		48	
Base Capacity (vph)	287	471	469	342	1081	2385	253	2474
Starvation Cap Reductn	0	0	0	0	0	283	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.01	0.29	0.46	0.61	0.77	0.09	0.55
Intersection Summary								



Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	73	9	444	97	444	1322	11	1222
v/c Ratio	0.86	0.01	0.57	0.27	0.68	1.07	0.03	0.71
Control Delay	107.8	19.9	6.6	22.5	36.4	75.3	27.7	26.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	107.8	19.9	6.6	22.5	36.4	75.3	27.7	26.7
Queue Length 50th (ft)	39	3	12	30	111	~408	5	197
Queue Length 95th (ft)	#117	14	84	72	157	#539	18	254
Internal Link Dist (ft)		97		247		579		1492
Turn Bay Length (ft)	200				195		48	
Base Capacity (vph)	85	641	778	355	694	1233	318	1712
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.86	0.01	0.57	0.27	0.64	1.07	0.03	0.71

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	579	531	325	1241	916	651
v/c Ratio	0.89	0.85	0.74	0.48	0.55	0.68
Control Delay	39.1	33.9	40.4	14.0	24.3	6.3
Queue Delay	0.0	0.0	0.0	0.9	0.0	0.0
Total Delay	39.1	33.9	40.4	14.8	24.4	6.3
Queue Length 50th (ft)	252	209	67	130	142	0
Queue Length 95th (ft)	#358	304	m96	160	165	46
Internal Link Dist (ft)	487			185	10	
Turn Bay Length (ft)						
Base Capacity (vph)	692	660	448	2608	1657	954
Starvation Cap Reductn	0	0	0	979	0	0
Spillback Cap Reductn	0	0	0	0	35	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.80	0.73	0.76	0.56	0.68

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	348	323	454	990	928	639
v/c Ratio	0.82	0.69	0.76	0.30	0.44	0.62
Control Delay	42.3	23.2	32.1	6.4	8.1	5.1
Queue Delay	0.0	0.0	0.2	0.9	0.0	0.0
Total Delay	42.3	23.2	32.4	7.2	8.2	5.1
Queue Length 50th (ft)	150	83	92	76	75	0
Queue Length 95th (ft)	#280	175	m115	m105	81	315
Internal Link Dist (ft)	487			185	10	
Turn Bay Length (ft)						
Base Capacity (vph)	470	511	643	3325	2122	1033
Starvation Cap Reductn	0	0	17	1926	0	0
Spillback Cap Reductn	0	0	0	0	131	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.63	0.73	0.71	0.47	0.62

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

	→	↘	↑	↙	↓
Lane Group	EBT	EBR	NBT	SBL	SBT
Lane Group Flow (vph)	490	617	1202	309	883
v/c Ratio	0.76	0.95	0.81	0.90	0.32
Control Delay	31.2	46.2	15.3	46.7	6.5
Queue Delay	0.0	48.3	38.9	1.8	0.3
Total Delay	31.2	94.5	54.2	48.5	6.7
Queue Length 50th (ft)	207	242	41	80	51
Queue Length 95th (ft)	323	#457	#252	m#244	m59
Internal Link Dist (ft)	522		75		185
Turn Bay Length (ft)					
Base Capacity (vph)	664	667	1482	351	2725
Starvation Cap Reductn	0	0	366	8	1077
Spillback Cap Reductn	0	248	0	0	433
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.74	1.47	1.08	0.90	0.54
Intersection Summary					
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.					
m Volume for 95th percentile queue is metered by upstream signal.					

	→	↘	↑	↙	↓
Lane Group	EBT	EBR	NBT	SBL	SBT
Lane Group Flow (vph)	688	720	742	548	602
v/c Ratio	1.00	0.93	0.70	1.11	0.23
Control Delay	61.2	36.5	10.5	91.6	4.9
Queue Delay	0.0	46.2	2.1	0.0	0.1
Total Delay	61.2	82.8	12.6	91.6	5.1
Queue Length 50th (ft)	~339	231	21	~322	13
Queue Length 95th (ft)	#600	#493	m33	#494	22
Internal Link Dist (ft)	522		75		185
Turn Bay Length (ft)					
Base Capacity (vph)	691	776	1225	495	2796
Starvation Cap Reductn	0	0	327	0	1128
Spillback Cap Reductn	0	192	0	0	858
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.00	1.23	0.83	1.11	0.36
Intersection Summary					
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.					
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.					
m Volume for 95th percentile queue is metered by upstream signal.					



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	176	835	66	385	33	835	593	1231	165
v/c Ratio	0.67	0.92	0.75	0.64	0.38	0.82	1.07	0.69	0.19
Control Delay	49.5	46.8	85.5	23.0	49.1	38.2	83.2	12.8	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	50.2	15.0	2.9	0.7
Total Delay	49.5	46.8	85.5	23.0	49.1	88.4	98.2	15.7	1.9
Queue Length 50th (ft)	84	216	33	54	16	145	~319	209	0
Queue Length 95th (ft)	#223	#344	#101	91	44	#196	m#475	m269	m10
Internal Link Dist (ft)		1051		991		2587		75	
Turn Bay Length (ft)	130		95		145		75		
Base Capacity (vph)	264	908	88	794	88	1016	553	1778	883
Starvation Cap Reductn	0	0	0	0	0	0	212	422	466
Spillback Cap Reductn	0	0	0	5	0	345	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.67	0.92	0.75	0.49	0.38	1.24	1.74	0.91	0.40

Intersection Summary

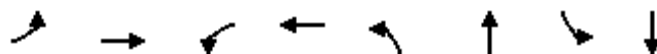
- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	310	712	69	701	69	874	471	1126	253
v/c Ratio	1.17	0.67	0.63	0.85	0.43	0.81	1.08	0.57	0.33
Control Delay	142.9	27.7	63.0	31.3	42.4	36.2	94.1	22.4	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	11.3	16.6	1.1
Total Delay	142.9	27.7	63.0	31.3	42.4	36.2	105.4	39.1	5.8
Queue Length 50th (ft)	~187	161	34	116	33	149	~281	195	14
Queue Length 95th (ft)	#322	211	#90	#176	70	186	m#384	m226	m21
Internal Link Dist (ft)		1051		991		2587		75	
Turn Bay Length (ft)	130		95		145		75		
Base Capacity (vph)	265	1061	110	852	177	1081	435	1984	771
Starvation Cap Reductn	0	0	0	0	0	0	155	868	312
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.17	0.67	0.63	0.82	0.39	0.81	1.68	1.01	0.55

Intersection Summary

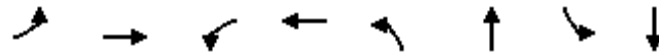
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Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	241	380	13	570	38	1291	228	582
v/c Ratio	0.80	0.28	0.16	0.77	0.31	0.86	0.79	0.26
Control Delay	55.1	18.6	45.8	31.9	46.9	36.9	56.3	15.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.1	18.6	45.8	31.9	46.9	36.9	56.3	15.2
Queue Length 50th (ft)	131	68	7	115	21	257	125	71
Queue Length 95th (ft)	#186	101	23	142	46	265	#187	84
Internal Link Dist (ft)		1221		1308		1386		2587
Turn Bay Length (ft)	120		140		150		200	
Base Capacity (vph)	333	1394	83	829	125	1494	312	2201
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.27	0.16	0.69	0.30	0.86	0.73	0.26

Intersection Summary

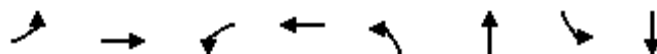
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	110	305	37	610	12	439	220	1158
v/c Ratio	0.55	0.29	0.28	0.72	0.11	0.32	0.69	0.47
Control Delay	43.6	18.2	38.8	28.2	36.3	22.2	40.6	13.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.6	18.2	38.8	28.2	36.3	22.2	40.6	13.4
Queue Length 50th (ft)	49	51	17	124	5	59	95	115
Queue Length 95th (ft)	#90	74	41	157	19	79	149	167
Internal Link Dist (ft)		1221		1308		1386		2587
Turn Bay Length (ft)	120		140		150		200	
Base Capacity (vph)	212	1219	133	1011	106	1374	372	2461
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.25	0.28	0.60	0.11	0.32	0.59	0.47

Intersection Summary

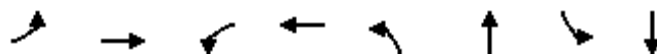
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	229	1940	120	1362	145	711	193	530
v/c Ratio	0.91	1.04	0.98	0.86	0.80	1.14	1.09	0.83
Control Delay	92.4	63.2	124.0	31.9	87.1	125.4	147.4	58.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	92.4	63.2	124.0	31.9	87.1	125.4	147.4	58.3
Queue Length 50th (ft)	192	~928	104	394	121	~356	~183	205
Queue Length 95th (ft)	#297	#915	m#197	m409	#196	#423	#300	245
Internal Link Dist (ft)		940		1530		2241		2375
Turn Bay Length (ft)	170		110		150		125	
Base Capacity (vph)	258	1861	122	1592	190	626	177	636
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.89	1.04	0.98	0.86	0.76	1.14	1.09	0.83

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	220	2594	99	2044	121	396	143	715
v/c Ratio	1.10	1.14	1.41	1.01	1.29	0.93	0.93	1.18
Control Delay	151.9	96.6	299.3	55.3	240.7	93.0	123.9	140.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	151.9	96.6	299.3	55.3	240.7	93.0	123.9	140.5
Queue Length 50th (ft)	~243	~1560	~129	~1105	~150	200	142	~384
Queue Length 95th (ft)	#417	#1678	#255	#1238	#288	#303	#281	#516
Internal Link Dist (ft)		940		1530		2241		2375
Turn Bay Length (ft)	170		110		150		125	
Base Capacity (vph)	200	2271	70	2015	94	424	153	607
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.10	1.14	1.41	1.01	1.29	0.93	0.93	1.18

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	90	2090	169	1337	67	472
v/c Ratio	0.52	0.95	1.47	0.60	0.20	1.08
Control Delay	9.3	12.5	273.4	8.4	18.7	93.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.3	12.5	273.4	8.4	18.7	93.1
Queue Length 50th (ft)	33	407	~94	139	17	~204
Queue Length 95th (ft)	m32	m387	#156	188	46	#366
Internal Link Dist (ft)		1530		999	321	2410
Turn Bay Length (ft)	110		110			
Base Capacity (vph)	174	2208	115	2218	339	436
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.95	1.47	0.60	0.20	1.08

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	83	2531	21	2073	52	73
v/c Ratio	0.54	0.87	0.14	0.72	0.21	0.30
Control Delay	25.3	13.2	5.6	7.0	21.7	21.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.3	13.2	5.6	7.0	21.7	21.7
Queue Length 50th (ft)	10	307	2	173	14	19
Queue Length 95th (ft)	#87	#654	10	334	40	49
Internal Link Dist (ft)		1530		999	321	2410
Turn Bay Length (ft)	110		110			
Base Capacity (vph)	154	2896	154	2898	598	590
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.87	0.14	0.72	0.09	0.12

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	156	1831	169	870	299	312	247	156	468
v/c Ratio	0.74	1.12	1.28	0.60	1.20	0.69	0.49	0.82	1.21
Control Delay	79.0	99.6	221.1	35.1	172.0	58.5	17.0	91.6	161.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	79.0	99.6	221.1	35.1	172.0	58.5	17.0	91.6	161.5
Queue Length 50th (ft)	138	~1009	~194	323	~330	264	50	140	~513
Queue Length 95th (ft)	176	#862	#277	335	#409	307	88	184	#573
Internal Link Dist (ft)		999		1167		2219			326
Turn Bay Length (ft)	105		115		150		150	150	
Base Capacity (vph)	266	1631	132	1448	249	449	506	204	387
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	1.12	1.28	0.60	1.20	0.69	0.49	0.76	1.21

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	114	2398	216	1886	125	318	136	102	443
v/c Ratio	0.96	1.22	1.29	0.92	1.34	0.93	0.39	0.91	1.22
Control Delay	139.4	136.4	216.7	37.2	260.6	93.8	24.1	131.6	171.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	139.4	136.5	216.7	37.2	260.6	93.8	24.1	131.6	171.2
Queue Length 50th (ft)	113	~1517	~267	842	~159	310	40	101	~527
Queue Length 95th (ft)	#236	#1582	#426	923	#289	#479	102	#213	#724
Internal Link Dist (ft)		999		1167		2219			326
Turn Bay Length (ft)	105		115		150		150	150	
Base Capacity (vph)	119	1962	168	2055	93	342	353	112	362
Starvation Cap Reductn	0	26	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	1.24	1.29	0.92	1.34	0.93	0.39	0.91	1.22

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1546	103	1022	40	20
v/c Ratio	0.72	0.44	0.37	0.22	0.11
Control Delay	13.5	32.8	2.9	31.2	14.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	13.5	32.8	2.9	31.2	14.3
Queue Length 50th (ft)	225	41	47	16	0
Queue Length 95th (ft)	#391	81	80	42	18
Internal Link Dist (ft)	1167		1368	223	
Turn Bay Length (ft)		160		100	
Base Capacity (vph)	2154	240	2773	404	377
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.72	0.43	0.37	0.10	0.05

Intersection Summary

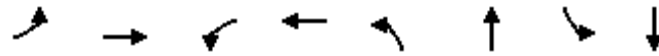
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	2159	76	2043	145	72
v/c Ratio	0.84	0.65	0.70	0.67	0.28
Control Delay	18.7	92.6	7.1	78.7	15.0
Queue Delay	0.5	0.0	0.0	0.0	0.0
Total Delay	19.2	92.6	7.1	78.7	15.0
Queue Length 50th (ft)	736	73	354	138	0
Queue Length 95th (ft)	854	#139	428	216	49
Internal Link Dist (ft)	1167		1368	223	
Turn Bay Length (ft)		160		100	
Base Capacity (vph)	2556	127	2915	224	263
Starvation Cap Reductn	112	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.88	0.60	0.70	0.65	0.27

Intersection Summary

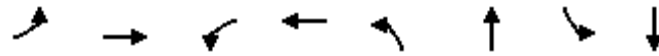
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	100	1713	113	1176	150	288	188	325
v/c Ratio	0.66	1.04	0.96	0.72	0.96	0.85	0.96	0.85
Control Delay	61.3	59.6	117.4	22.3	104.7	56.8	96.9	52.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.3	59.6	117.4	22.3	104.7	56.8	96.9	52.4
Queue Length 50th (ft)	56	~560	65	278	87	144	108	157
Queue Length 95th (ft)	#101	#561	#143	296	#171	#228	#199	#242
Internal Link Dist (ft)		2600		1278		1745		1836
Turn Bay Length (ft)	110		110		140		140	
Base Capacity (vph)	157	1641	118	1643	157	337	196	381
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	1.04	0.96	0.72	0.96	0.85	0.96	0.85

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	117	1532	85	1585	74	276	96	330
v/c Ratio	0.85	0.87	0.87	0.95	0.76	0.74	0.81	0.77
Control Delay	89.1	26.8	105.4	35.6	85.8	45.2	87.9	45.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	89.1	26.8	105.4	35.6	85.8	45.2	87.9	45.3
Queue Length 50th (ft)	67	384	49	430	42	139	55	170
Queue Length 95th (ft)	#165	492	#136	#603	#117	#252	#142	#315
Internal Link Dist (ft)		2600		1278		1745		1836
Turn Bay Length (ft)	110		110		140		140	
Base Capacity (vph)	137	1759	98	1677	98	372	118	427
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.87	0.87	0.95	0.76	0.74	0.81	0.77

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

APPENDIX J

Ramp Merge/Diverge Analysis

2014 Traffic Volumes Book

Dist	Route	County	Postmile	Description	Back Peak Hour	Back Peak Month	Back AADT	Ahead Peak Hour	Ahead Peak Month	Ahead AADT
12	91	ORA	5.258	ANAHEIM, STATE COLLEGE BOULEVARD	18000	270000	258700	17500	265000	254000
12	91	ORA	6.119	ANAHEIM, JCT. RTE. 57	17500	265000	254000	15700	235000	224000
12	91	ORA	7.353	KRAEMER BOULEVARD/ GLASSELL STREET	15600	235000	224000	15100	227000	216700
12	91	ORA	8.399	TUSTIN AVENUE	15100	227000	216700	16200	243000	231300
12	91	ORA	9.187	JCT. RTE. 55 SOUTH	16200	243000	231300	20400	338000	322000
12	91	ORA	10.091	LAKEVIEW AVENUE	20400	338000	322000	19100	319000	302900
12	91	ORA	11.54	PERALTA, JCT. RTE. 90 WEST	19100	319000	302900	16100	267000	256000
12	91	ORA	14.431	R WEIR CANYON ROAD	16200	267000	256000	14700	247000	233700
12	91	ORA	14.431	L WEIR CANYON ROAD	16100	267000	255600	14600	244000	234000
12	91	ORA	15.925	JCT. RTE. 241	14700	244000	233600	17700	270000	259600
12	91	ORA	16.404	GYPSUM CANYON ROAD	17700	270000	259600	17700	269000	259600
12	91	ORA	17.95	R COAL CANYON ROAD RIGHT	16400	269000	259600	17800	269000	259600
12	91	ORA	17.973	L COAL CANYON ROAD LEFT	16500	269000	260000	17900	269000	260000
12	91	ORA	18.905	ORANGE/RIVERSIDE COUNTY LINE	17900	265000	260000			
8	91	RIV	0	ORANGE/RIVERSIDE COUNTY LINE				18200	269000	264000
8	91	RIV	1.031	GREEN RIVER DRIVE	18300	272000	267000	16700	258000	253000
8	91	RIV	2.087	JCT. RTE. 71 NORTH	16700	258000	253000	16500	269000	256000
8	91	RIV	3.705	SERFAS CLUB DRIVE	16500	269000	256000	16700	270000	257000
8	91	RIV	4.157	MAPLE STREET	16700	270000	257000	16000	260000	248000
8	91	RIV	5.383	CORONA, LINCOLN AVENUE	16000	260000	248000	16400	268000	255000
8	91	RIV	6.024	CORONA, WEST GRAND BOULEVARD	16400	268000	255000	16000	259000	247000
8	91	RIV	6.343	CORONA, MAIN STREET	16000	259000	247000	15000	245000	233000
8	91	RIV	7.451	CORONA, JCT. RTE. 15	15000	245000	233000	15200	230000	219000
8	91	RIV	9.18	MC KINLEY STREET	15200	230000	219000	14700	219000	209000
8	91	RIV	10.806	RIVERSIDE, PIERCE STREET	14700	219000	209000	12600	191000	182000
8	91	RIV	11.097	RIVERSIDE, MAGNOLIA AVENUE	12600	191000	182000	13500	203000	193000
8	91	RIV	11.991	RIVERSIDE, LA SIERRA AVENUE	13500	203000	193000	12900	195000	186000
8	91	RIV	13.04	RIVERSIDE, TYLER STREET	12900	195000	186000	13100	193000	186000
8	91	RIV	14.079	RIVERSIDE, VAN BUREN STREET	13100	193000	186000	12100	180000	173000
8	91	RIV	15.627	RIVERSIDE, ADAMS STREET	12100	180000	173000	12100	178000	172000
8	91	RIV	16.651	RIVERSIDE, MADISON STREET	12100	178000	172000	11800	174000	168000

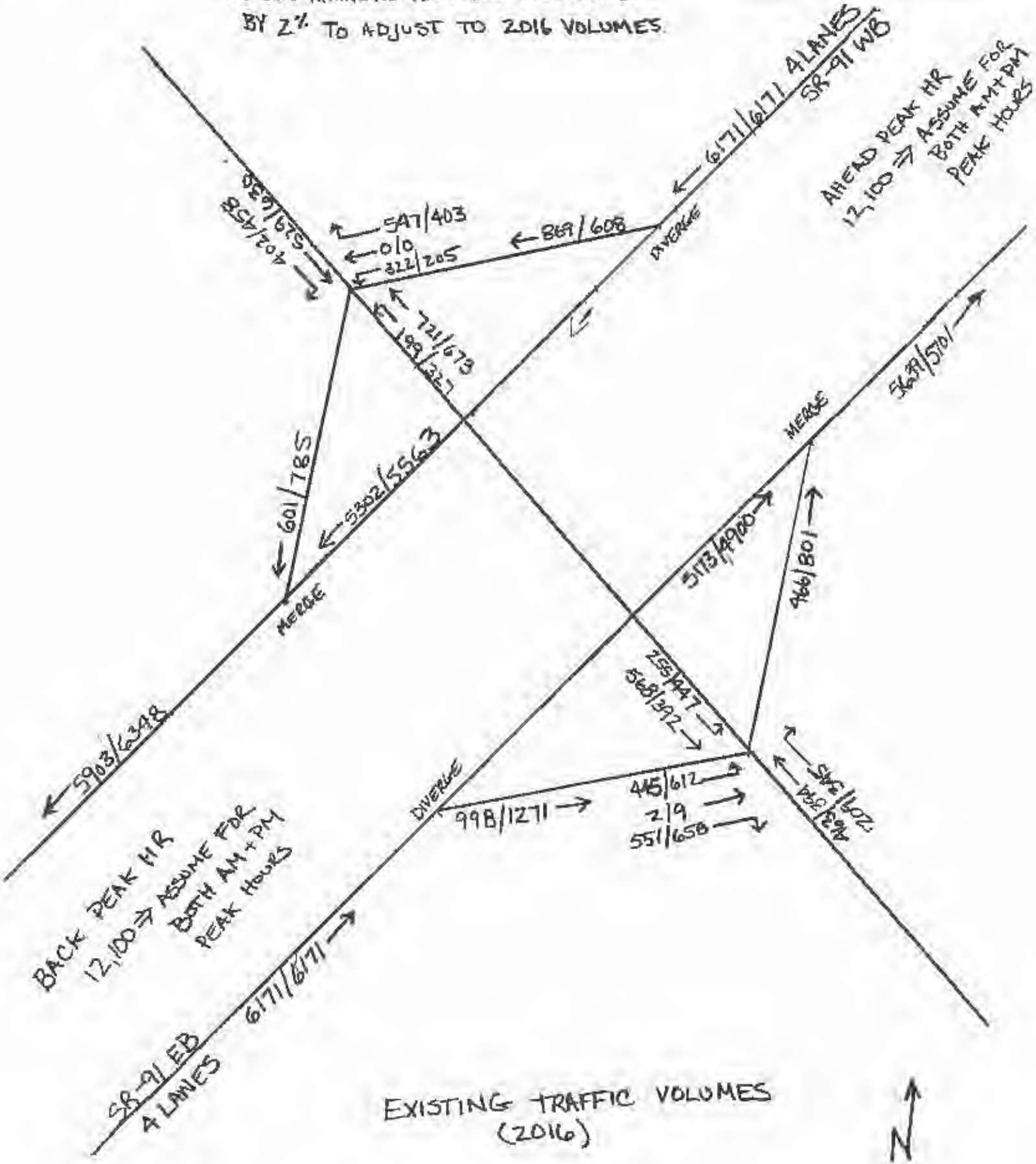


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Date: 3/27/16
Job No.: 15620-DG
Page: _____
Done By: JC
Checked By: BRS

* 2014 MAINLINE VOLUMES INCREASED
BY 2% TO ADJUST TO 2016 VOLUMES.



RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		REC		Freeway/Dir of Travel		SR 91 Eastbound			
Agency or Company		Rick Engineering Company		Junction		Adams Street			
Date Performed		4/1/2016		Jurisdiction		Caltrans			
Analysis Time Period		AM Peak Hour		Analysis Year		Existing (Year 2016)			
Project Description California Baptist University									
Inputs									
Upstream Adj Ramp ☒ Yes ☒ On ☐ No ☐ Off $L_{up} = 2000$ ft $V_u = 466$ veh/h		Freeway Number of Lanes, N				4		Downstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{down} =$ ft $V_D =$ veh/h	
		Ramp Number of Lanes, N				2			
		Acceleration Lane Length, L_A							
		Deceleration Lane Length L_D				0			
		Freeway Volume, V_F				5173			
		Ramp Volume, V_R				998			
Freeway Free-Flow Speed, S_{FF}				65.0					
Ramp Free-Flow Speed, S_{FR}				35.0					
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	5173	0.90	Level	2	1	0.988	1.00	5817	
Ramp	998	0.90	Level	2	1	0.988	1.00	1122	
UpStream	466	0.90	Level	2	1	0.988	1.00	524	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$ $L_{EQ} =$ (Equation 13-6 or 13-7) $P_{FM} =$ using Equation (Exhibit 13-6) $V_{12} =$ pc/h V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☐ Yes ☐ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ $L_{EQ} =$ (Equation 13-12 or 13-13) $P_{FD} = 0.260$ using Equation (Exhibit 13-7) $V_{12} = 2343$ pc/h V_3 or V_{av34} 1737 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☐ Yes ☒ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8			V_F	5817	Exhibit 13-8	9400	No
				$V_{FO} = V_F - V_R$	4695	Exhibit 13-8	9400	No	
				V_R	1122	Exhibit 13-10	4000	No	
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8			V_{12}	2343	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R = 10.9$ (pc/mi/ln) LOS = B (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ (Exhibit 13-11) $S_R =$ mph (Exhibit 13-11) $S_0 =$ mph (Exhibit 13-11) $S =$ mph (Exhibit 13-13)					$D_S = 0.529$ (Exhibit 13-12) $S_R = 52.8$ mph (Exhibit 13-12) $S_0 = 68.4$ mph (Exhibit 13-12) $S = 61.2$ mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		REC		Freeway/Dir of Travel		SR 91 Eastbound			
Agency or Company		Rick Engineering Company		Junction		Adams Street			
Date Performed		4/1/2016		Jurisdiction		Caltrans			
Analysis Time Period		AM Peak Hour		Analysis Year		Existing (Year 2016)			
Project Description California Baptist University									
Inputs									
Upstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{up} =$ ft $V_u =$ veh/h		Freeway Number of Lanes, N 3				Downstream Adj Ramp ☒ Yes ☐ On ☐ No ☒ Off $L_{down} =$ 2000 ft $V_D =$ 998 veh/h			
		Ramp Number of Lanes, N 1							
		Acceleration Lane Length, L_A 700							
		Deceleration Lane Length L_D							
		Freeway Volume, V_F 5173							
		Ramp Volume, V_R 466							
Freeway Free-Flow Speed, S_{FF} 65.0									
Ramp Free-Flow Speed, S_{FR} 35.0									
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	5173	0.90	Level	2	1	0.988	1.00	5817	
Ramp	466	0.90	Level	2	1	0.988	1.00	524	
UpStream									
DownStream	998	0.90	Level	2	1	0.988	1.00	1122	
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$ $L_{EQ} =$ 6081.30 (Equation 13-6 or 13-7) $P_{FM} =$ 0.696 using Equation (Exhibit 13-6) $V_{12} =$ 4049 pc/h V_3 or V_{av34} 1768 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☐ Yes ☒ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ $L_{EQ} =$ (Equation 13-12 or 13-13) $P_{FD} =$ using Equation (Exhibit 13-7) $V_{12} =$ pc/h V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☐ Yes ☐ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}	6341	Exhibit 13-8		No	V_F		Exhibit 13-8		
					$V_{FO} = V_F - V_R$		Exhibit 13-8		
					V_R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V_{R12}	4573	Exhibit 13-8	4600:All	No	V_{12}		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ 36.5 (pc/mi/ln) LOS = E (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ 0.650 (Exhibit 13-11) $S_R =$ 50.1 mph (Exhibit 13-11) $S_0 =$ 60.4 mph (Exhibit 13-11) $S =$ 52.6 mph (Exhibit 13-13)					$D_s =$ (Exhibit 13-12) $S_R =$ mph (Exhibit 13-12) $S_0 =$ mph (Exhibit 13-12) $S =$ mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		REC		Freeway/Dir of Travel		SR 91 Eastbound			
Agency or Company		Rick Engineering Company		Junction		Adams Street			
Date Performed		4/1/2016		Jurisdiction		Caltrans			
Analysis Time Period		PM Peak Hour		Analysis Year		Existing (Year 2016)			
Project Description California Baptist University									
Inputs									
Upstream Adj Ramp ☒ Yes ☒ On ☐ No ☐ Off L _{up} = 2000 ft V _u = 801 veh/h		Freeway Number of Lanes, N				4		Downstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off L _{down} = ft V _D = veh/h	
		Ramp Number of Lanes, N				2			
		Acceleration Lane Length, L _A							
		Deceleration Lane Length L _D				0			
		Freeway Volume, V _F				4900			
		Ramp Volume, V _R				1271			
Freeway Free-Flow Speed, S _{FF}				65.0					
Ramp Free-Flow Speed, S _{FR}				35.0					
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF × f _{HV} × f _p	
Freeway	4900	0.90	Level	2	1	0.988	1.00	5510	
Ramp	1271	0.90	Level	2	1	0.988	1.00	1429	
UpStream	801	0.90	Level	2	1	0.988	1.00	901	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v₁₂					Estimation of v₁₂				
V ₁₂ = V _F (P _{FM}) L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? ☐ Yes ☐ No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 ☐ Yes ☐ No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					V ₁₂ = V _R + (V _F - V _R)P _{FD} L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.260 using Equation (Exhibit 13-7) V ₁₂ = 2490 pc/h V ₃ or V _{av34} 1510 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? ☐ Yes ☒ No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 ☐ Yes ☒ No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	5510	Exhibit 13-8	9400	No
				V _{FO} = V _F - V _R	4081	Exhibit 13-8	9400	No	
				V _R	1429	Exhibit 13-10	4000	No	
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}		Exhibit 13-8			V ₁₂	2490	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
D _R = 5.475 + 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A					D _R = 4.252 + 0.0086 V ₁₂ - 0.009 L _D				
D _R = (pc/mi/ln)					D _R = 12.2 (pc/mi/ln)				
LOS = (Exhibit 13-2)					LOS = B (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = (Exhibit 13-11)					D _S = 0.557 (Exhibit 13-12)				
S _R = mph (Exhibit 13-11)					S _R = 52.2 mph (Exhibit 13-12)				
S ₀ = mph (Exhibit 13-11)					S ₀ = 69.3 mph (Exhibit 13-12)				
S = mph (Exhibit 13-13)					S = 60.4 mph (Exhibit 13-13)				

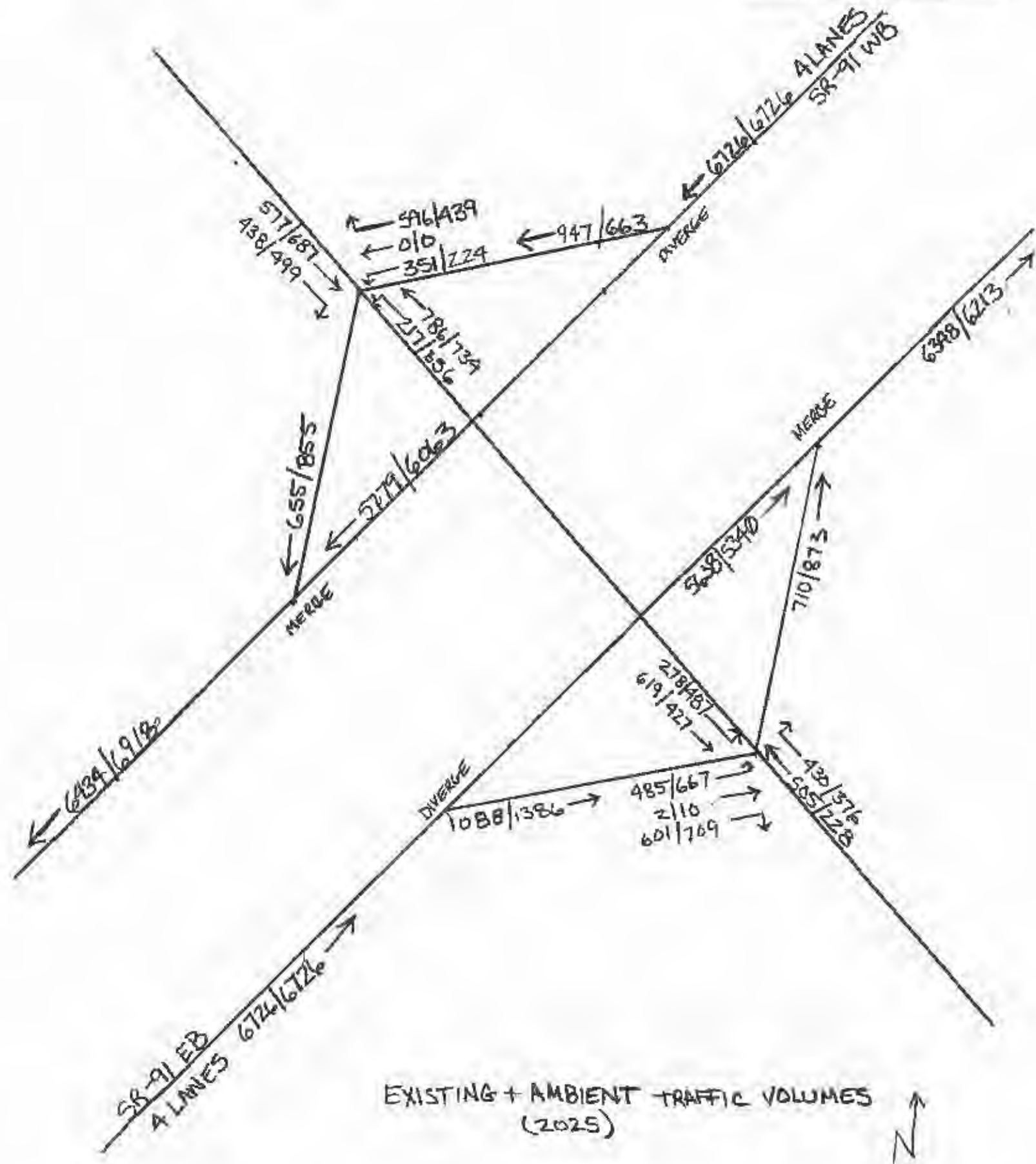
RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		REC		Freeway/Dir of Travel		SR 91 Eastbound			
Agency or Company		Rick Engineering Company		Junction		Adams Street			
Date Performed		4/1/2016		Jurisdiction		Caltrans			
Analysis Time Period		PM Peak Hour		Analysis Year		Existing (Year 2016)			
Project Description California Baptist University									
Inputs									
Upstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{up} =$ ft $V_u =$ veh/h		Freeway Number of Lanes, N 3				Downstream Adj Ramp ☒ Yes ☐ On ☐ No ☒ Off $L_{down} =$ 2000 ft $V_D =$ 1271 veh/h			
		Ramp Number of Lanes, N 1							
		Acceleration Lane Length, L_A 700							
		Deceleration Lane Length L_D							
		Freeway Volume, V_F 4900							
		Ramp Volume, V_R 801							
Freeway Free-Flow Speed, S_{FF} 65.0									
Ramp Free-Flow Speed, S_{FR} 35.0									
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	4900	0.90	Level	2	1	0.988	1.00	5510	
Ramp	801	0.90	Level	2	1	0.988	1.00	901	
UpStream									
DownStream	1271	0.90	Level	2	1	0.988	1.00	1429	
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$ $L_{EQ} =$ 7745.26 (Equation 13-6 or 13-7) $P_{FM} =$ 0.736 using Equation (Exhibit 13-6) $V_{12} =$ 4058 pc/h V_3 or V_{av34} 1452 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☒ Yes ☐ No If Yes, $V_{12a} =$ 4058 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ $L_{EQ} =$ (Equation 13-12 or 13-13) $P_{FD} =$ using Equation (Exhibit 13-7) $V_{12} =$ pc/h V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☐ Yes ☐ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}	6411	Exhibit 13-8		No	V_F		Exhibit 13-8		
					$V_{FO} = V_F - V_R$		Exhibit 13-8		
					V_R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V_{R12}	4959	Exhibit 13-8	4600:All	Yes	V_{12}		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ 39.4 (pc/mi/ln) LOS = E (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ 0.828 (Exhibit 13-11) $S_R =$ 46.0 mph (Exhibit 13-11) $S_0 =$ 61.6 mph (Exhibit 13-11) $S =$ 48.8 mph (Exhibit 13-13)					$D_s =$ (Exhibit 13-12) $S_R =$ mph (Exhibit 13-12) $S_0 =$ mph (Exhibit 13-12) $S =$ mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET										
General Information					Site Information					
Analyst		REC		Freeway/Dir of Travel		SR 91 Westbound				
Agency or Company		Rick Engineering Company		Junction		Adams Street				
Date Performed		4/1/2016		Jurisdiction		Caltrans				
Analysis Time Period		AM Peak Hour		Analysis Year		Existing (Year 2016)				
Project Description California Baptist University										
Inputs										
Upstream Adj Ramp ☒ Yes ☒ On ☐ No ☐ Off L _{up} = 2400 ft V _u = 601 veh/h		Freeway Number of Lanes, N 4 Ramp Number of Lanes, N 2 Acceleration Lane Length, L _A Deceleration Lane Length L _D 0 Freeway Volume, V _F 5302 Ramp Volume, V _R 869 Freeway Free-Flow Speed, S _{FF} 65.0 Ramp Free-Flow Speed, S _{FR} 35.0				Downstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off L _{down} = ft V _D = veh/h				
Conversion to pc/h Under Base Conditions										
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p		
Freeway	5302	0.90	Level	2	1	0.988	1.00	5962		
Ramp	869	0.90	Level	2	1	0.988	1.00	977		
UpStream	601	0.90	Level	2	1	0.988	1.00	676		
DownStream										
Merge Areas					Diverge Areas					
Estimation of v₁₂					Estimation of v₁₂					
V ₁₂ = V _F (P _{FM}) L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? ☐ Yes ☐ No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 ☐ Yes ☐ No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					V ₁₂ = V _R + (V _F - V _R)P _{FD} L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.260 using Equation (Exhibit 13-7) V ₁₂ = 2273 pc/h V ₃ or V _{av34} 1844 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? ☐ Yes ☒ No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 ☒ Yes ☐ No If Yes, V _{12a} = 2384 pc/h (Equation 13-16, 13-18, or 13-19)					
Capacity Checks					Capacity Checks					
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?	
V _{FO}		Exhibit 13-8				V _F	5962	Exhibit 13-8	9400	No
					V _{FO} = V _F - V _R	4985	Exhibit 13-8	9400	No	
					V _R	977	Exhibit 13-10	4000	No	
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area					
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?	
	V _{R12}	Exhibit 13-8				V ₁₂	2273	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)					
D _R = 5.475 + 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					D _R = 4.252 + 0.0086 V ₁₂ - 0.009 L _D D _R = 11.3 (pc/mi/ln) LOS = B (Exhibit 13-2)					
Speed Determination					Speed Determination					
M _S = (Exhibit 13-11) S _R = mph (Exhibit 13-11) S ₀ = mph (Exhibit 13-11) S = mph (Exhibit 13-13)					D _S = 0.516 (Exhibit 13-12) S _R = 53.1 mph (Exhibit 13-12) S ₀ = 68.2 mph (Exhibit 13-12) S = 61.3 mph (Exhibit 13-13)					

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		REC		Freeway/Dir of Travel		SR 91 Westbound			
Agency or Company		Rick Engineering Company		Junction		Adams Street			
Date Performed		4/1/2016		Jurisdiction		Caltrans			
Analysis Time Period		AM Peak Hour		Analysis Year		Existing (Year 2016)			
Project Description California Baptist University									
Inputs									
Upstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{up} =$ ft $V_u =$ veh/h		Freeway Number of Lanes, N 4				Downstream Adj Ramp ☒ Yes ☒ On ☐ No ☐ Off $L_{down} =$ 2400 ft $V_D =$ 869 veh/h			
		Ramp Number of Lanes, N 1							
		Acceleration Lane Length, L_A 1500							
		Deceleration Lane Length L_D							
		Freeway Volume, V_F 5302							
		Ramp Volume, V_R 601							
Freeway Free-Flow Speed, S_{FF} 65.0									
Ramp Free-Flow Speed, S_{FR} 35.0									
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	5302	0.90	Level	2	1	0.988	1.00	5962	
Ramp	601	0.90	Level	2	1	0.988	1.00	676	
UpStream									
DownStream	869	0.90	Level	2	1	0.988	1.00	977	
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$ $L_{EQ} =$ (Equation 13-6 or 13-7) $P_{FM} =$ 0.133 using Equation (Exhibit 13-6) $V_{12} =$ 795 pc/h V_3 or V_{av34} 2583 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☒ Yes ☐ No If Yes, $V_{12a} =$ 2384 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ $L_{EQ} =$ (Equation 13-12 or 13-13) $P_{FD} =$ using Equation (Exhibit 13-7) $V_{12} =$ pc/h V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☐ Yes ☐ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}	6638	Exhibit 13-8		No	V_F		Exhibit 13-8		
					$V_{FO} = V_F - V_R$		Exhibit 13-8		
					V_R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V_{R12}	3060	Exhibit 13-8	4600:All	No	V_{12}		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ 19.6 (pc/mi/ln) $LOS =$ B (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ (pc/mi/ln) $LOS =$ (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ 0.299 (Exhibit 13-11) $S_R =$ 58.1 mph (Exhibit 13-11) $S_0 =$ 60.4 mph (Exhibit 13-11) $S =$ 59.3 mph (Exhibit 13-13)					$D_s =$ (Exhibit 13-12) $S_R =$ mph (Exhibit 13-12) $S_0 =$ mph (Exhibit 13-12) $S =$ mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET										
General Information					Site Information					
Analyst		REC		Freeway/Dir of Travel		SR 91 Westbound				
Agency or Company		Rick Engineering Company		Junction		Adams Street				
Date Performed		4/1/2016		Jurisdiction		Caltrans				
Analysis Time Period		PM Peak Hour		Analysis Year		Existing (Year 2016)				
Project Description California Baptist University										
Inputs										
Upstream Adj Ramp ☒ Yes ☒ On ☐ No ☐ Off L _{up} = 2400 ft V _u = 785 veh/h		Freeway Number of Lanes, N 4 Ramp Number of Lanes, N 2 Acceleration Lane Length, L _A Deceleration Lane Length L _D 0 Freeway Volume, V _F 5563 Ramp Volume, V _R 608 Freeway Free-Flow Speed, S _{FF} 65.0 Ramp Free-Flow Speed, S _{FR} 35.0				Downstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off L _{down} = ft V _D = veh/h				
Conversion to pc/h Under Base Conditions										
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p		
Freeway	5563	0.90	Level	2	1	0.988	1.00	6255		
Ramp	608	0.90	Level	2	1	0.988	1.00	684		
UpStream	785	0.90	Level	2	1	0.988	1.00	883		
DownStream										
Merge Areas					Diverge Areas					
Estimation of v₁₂					Estimation of v₁₂					
V ₁₂ = V _F (P _{FM}) L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? ☐ Yes ☐ No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 ☐ Yes ☐ No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					V ₁₂ = V _R + (V _F - V _R)P _{FD} L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.260 using Equation (Exhibit 13-7) V ₁₂ = 2132 pc/h V ₃ or V _{av34} 2061 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? ☐ Yes ☒ No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 ☒ Yes ☐ No If Yes, V _{12a} = 2502 pc/h (Equation 13-16, 13-18, or 13-19)					
Capacity Checks					Capacity Checks					
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?	
V _{FO}		Exhibit 13-8				V _F	6255	Exhibit 13-8	9400	No
					V _{FO} = V _F - V _R	5571	Exhibit 13-8	9400	No	
					V _R	684	Exhibit 13-10	4000	No	
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area					
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?	
	V _{R12}		Exhibit 13-8			V ₁₂	2132	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)					
D _R = 5.475 + 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					D _R = 4.252 + 0.0086 V ₁₂ - 0.009 L _D D _R = 12.3 (pc/mi/ln) LOS = B (Exhibit 13-2)					
Speed Determination					Speed Determination					
M _S = (Exhibit 13-11) S _R = mph (Exhibit 13-11) S ₀ = mph (Exhibit 13-11) S = mph (Exhibit 13-13)					D _S = 0.490 (Exhibit 13-12) S _R = 53.7 mph (Exhibit 13-12) S ₀ = 67.9 mph (Exhibit 13-12) S = 61.4 mph (Exhibit 13-13)					

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		REC		Freeway/Dir of Travel		SR 91 Westbound			
Agency or Company		Rick Engineering Company		Junction		Adams Street			
Date Performed		4/1/2016		Jurisdiction		Caltrans			
Analysis Time Period		PM Peak Hour		Analysis Year		Existing (Year 2016)			
Project Description California Baptist University									
Inputs									
Upstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{up} =$ ft $V_u =$ veh/h		Freeway Number of Lanes, N 4				Downstream Adj Ramp ☒ Yes ☒ On ☐ No ☐ Off $L_{down} =$ 2400 ft $V_D =$ 608 veh/h			
		Ramp Number of Lanes, N 1							
		Acceleration Lane Length, L_A 1500							
		Deceleration Lane Length L_D							
		Freeway Volume, V_F 5563							
		Ramp Volume, V_R 785							
Freeway Free-Flow Speed, S_{FF} 65.0				Ramp Free-Flow Speed, S_{FR} 35.0					
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	5563	0.90	Level	2	1	0.988	1.00	6255	
Ramp	785	0.90	Level	2	1	0.988	1.00	883	
UpStream									
DownStream	608	0.90	Level	2	1	0.988	1.00	684	
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$ $L_{EQ} =$ (Equation 13-6 or 13-7) $P_{FM} =$ 0.107 using Equation (Exhibit 13-6) $V_{12} =$ 672 pc/h V_3 or V_{av34} 2791 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☒ Yes ☐ No Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☒ Yes ☐ No If Yes, $V_{12a} =$ 2502 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ $L_{EQ} =$ (Equation 13-12 or 13-13) $P_{FD} =$ using Equation (Exhibit 13-7) $V_{12} =$ pc/h V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☐ Yes ☐ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}	7138	Exhibit 13-8		No	V_F		Exhibit 13-8		
					$V_{FO} = V_F - V_R$		Exhibit 13-8		
					V_R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V_{R12}	3385	Exhibit 13-8	4600:All	No	V_{12}		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ 22.1 (pc/mi/ln) LOS = C (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ 0.331 (Exhibit 13-11) $S_R =$ 57.4 mph (Exhibit 13-11) $S_0 =$ 60.0 mph (Exhibit 13-11) $S =$ 58.8 mph (Exhibit 13-13)					$D_s =$ (Exhibit 13-12) $S_R =$ mph (Exhibit 13-12) $S_0 =$ mph (Exhibit 13-12) $S =$ mph (Exhibit 13-13)				



RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		REC		Freeway/Dir of Travel		SR 91 Eastbound			
Agency or Company		Rick Engineering Company		Junction		Adams Street			
Date Performed		4/1/2016		Jurisdiction		Caltrans			
Analysis Time Period		AM Peak Hour		Analysis Year		Existing + Ambient (Year 2025)			
Project Description California Baptist University									
Inputs									
Upstream Adj Ramp ☒ Yes ☒ On ☐ No ☐ Off $L_{up} = 2000$ ft $V_u = 710$ veh/h		Freeway Number of Lanes, N				4		Downstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{down} =$ ft $V_D =$ veh/h	
		Ramp Number of Lanes, N				2			
		Acceleration Lane Length, L_A							
		Deceleration Lane Length L_D				0			
		Freeway Volume, V_F				5638			
		Ramp Volume, V_R				1088			
Freeway Free-Flow Speed, S_{FF}				65.0					
Ramp Free-Flow Speed, S_{FR}				35.0					
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	5638	0.90	Level	2	1	0.988	1.00	6340	
Ramp	1088	0.90	Level	2	1	0.988	1.00	1223	
UpStream	710	0.90	Level	2	1	0.988	1.00	798	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$ $L_{EQ} =$ (Equation 13-6 or 13-7) $P_{FM} =$ using Equation (Exhibit 13-6) $V_{12} =$ pc/h V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☐ Yes ☐ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ $L_{EQ} =$ (Equation 13-12 or 13-13) $P_{FD} =$ 0.260 using Equation (Exhibit 13-7) $V_{12} =$ 2553 pc/h V_3 or V_{av34} 1893 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☐ Yes ☒ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8			V_F	6340	Exhibit 13-8	9400	No
			$V_{FO} = V_F - V_R$	5117	Exhibit 13-8	9400	No		
			V_R	1223	Exhibit 13-10	4000	No		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8			V_{12}	2553	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ (pc/mi/ln) $LOS =$ (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ 12.7 (pc/mi/ln) $LOS =$ B (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ (Exhibit 13-11) $S_R =$ mph (Exhibit 13-11) $S_0 =$ mph (Exhibit 13-11) $S =$ mph (Exhibit 13-13)					$D_S =$ 0.538 (Exhibit 13-12) $S_R =$ 52.6 mph (Exhibit 13-12) $S_0 =$ 67.8 mph (Exhibit 13-12) $S =$ 60.8 mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		REC		Freeway/Dir of Travel		SR 91 Eastbound			
Agency or Company		Rick Engineering Company		Junction		Adams Street			
Date Performed		4/1/2016		Jurisdiction		Caltrans			
Analysis Time Period		AM Peak Hour		Analysis Year		Existing + Ambient (Year 2025)			
Project Description California Baptist University									
Inputs									
Upstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{up} =$ ft $V_u =$ veh/h		Freeway Number of Lanes, N 3				Downstream Adj Ramp ☒ Yes ☐ On ☐ No ☒ Off $L_{down} =$ 2000 ft $V_D =$ 1088 veh/h			
		Ramp Number of Lanes, N 1							
		Acceleration Lane Length, L_A 700							
		Deceleration Lane Length L_D							
		Freeway Volume, V_F 5638							
		Ramp Volume, V_R 710							
Freeway Free-Flow Speed, S_{FF} 65.0									
Ramp Free-Flow Speed, S_{FR} 35.0									
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	5638	0.90	Level	2	1	0.988	1.00	6340	
Ramp	710	0.90	Level	2	1	0.988	1.00	798	
UpStream									
DownStream	1088	0.90	Level	2	1	0.988	1.00	1223	
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$ $L_{EQ} =$ 6628.73 (Equation 13-6 or 13-7) $P_{FM} =$ 0.709 using Equation (Exhibit 13-6) $V_{12} =$ 4498 pc/h V_3 or V_{av34} 1842 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☒ Yes ☐ No If Yes, $V_{12a} =$ 4498 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ $L_{EQ} =$ (Equation 13-12 or 13-13) $P_{FD} =$ using Equation (Exhibit 13-7) $V_{12} =$ pc/h V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☐ Yes ☐ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}	7138	Exhibit 13-8		Yes	V_F		Exhibit 13-8		
					$V_{FO} = V_F - V_R$		Exhibit 13-8		
					V_R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V_{R12}	5296	Exhibit 13-8	4600:All	Yes	V_{12}		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ 42.0 (pc/mi/ln) LOS = F (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ 1.050 (Exhibit 13-11) $S_R =$ 40.8 mph (Exhibit 13-11) $S_0 =$ 60.2 mph (Exhibit 13-11) $S =$ 44.5 mph (Exhibit 13-13)					$D_s =$ (Exhibit 13-12) $S_R =$ mph (Exhibit 13-12) $S_0 =$ mph (Exhibit 13-12) $S =$ mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		REC		Freeway/Dir of Travel		SR 91 Eastbound			
Agency or Company		Rick Engineering Company		Junction		Adams Street			
Date Performed		4/1/2016		Jurisdiction		Caltrans			
Analysis Time Period		PM Peak Hour		Analysis Year		Existing + Ambient (Year 2025)			
Project Description California Baptist University									
Inputs									
Upstream Adj Ramp ☒ Yes ☒ On ☐ No ☐ Off L _{up} = 2000 ft V _u = 873 veh/h		Freeway Number of Lanes, N				4		Downstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off L _{down} = ft V _D = veh/h	
		Ramp Number of Lanes, N				2			
		Acceleration Lane Length, L _A							
		Deceleration Lane Length L _D				0			
		Freeway Volume, V _F				5340			
		Ramp Volume, V _R				1386			
Freeway Free-Flow Speed, S _{FF}				65.0					
Ramp Free-Flow Speed, S _{FR}				35.0					
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF × f _{HV} × f _p	
Freeway	5340	0.90	Level	2	1	0.988	1.00	6005	
Ramp	1386	0.90	Level	2	1	0.988	1.00	1558	
UpStream	873	0.90	Level	2	1	0.988	1.00	982	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v₁₂					Estimation of v₁₂				
V ₁₂ = V _F (P _{FM}) (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? ☐ Yes ☐ No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 ☐ Yes ☐ No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					V ₁₂ = V _R + (V _F - V _R)P _{FD} (Equation 13-12 or 13-13) P _{FD} = 0.260 using Equation (Exhibit 13-7) V ₁₂ = 2714 pc/h V ₃ or V _{av34} 1645 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? ☐ Yes ☒ No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 ☐ Yes ☒ No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	6005	Exhibit 13-8	9400	No
				V _{FO} = V _F - V _R	4447	Exhibit 13-8	9400	No	
				V _R	1558	Exhibit 13-10	4000	No	
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}		Exhibit 13-8			V ₁₂	2714	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
D _R = 5.475 + 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					D _R = 4.252 + 0.0086 V ₁₂ - 0.009 L _D D _R = 14.1 (pc/mi/ln) LOS = B (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = (Exhibit 13-11) S _R = mph (Exhibit 13-11) S ₀ = mph (Exhibit 13-11) S = mph (Exhibit 13-13)					D _S = 0.568 (Exhibit 13-12) S _R = 51.9 mph (Exhibit 13-12) S ₀ = 68.8 mph (Exhibit 13-12) S = 60.0 mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		REC		Freeway/Dir of Travel		SR 91 Eastbound			
Agency or Company		Rick Engineering Company		Junction		Adams Street			
Date Performed		4/1/2016		Jurisdiction		Caltrans			
Analysis Time Period		PM Peak Hour		Analysis Year		Existing + Ambient (Year 2025)			
Project Description California Baptist University									
Inputs									
Upstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{up} =$ ft $V_u =$ veh/h		Freeway Number of Lanes, N 3				Downstream Adj Ramp ☒ Yes ☐ On ☐ No ☒ Off $L_{down} =$ 2000 ft $V_D =$ 1386 veh/h			
		Ramp Number of Lanes, N 1							
		Acceleration Lane Length, L_A 700							
		Deceleration Lane Length L_D							
		Freeway Volume, V_F 5340							
		Ramp Volume, V_R 873							
Freeway Free-Flow Speed, S_{FF} 65.0									
Ramp Free-Flow Speed, S_{FR} 35.0									
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	5340	0.90	Level	2	1	0.988	1.00	6005	
Ramp	873	0.90	Level	2	1	0.988	1.00	982	
UpStream									
DownStream	1386	0.90	Level	2	1	0.988	1.00	1558	
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$ $L_{EQ} =$ 8444.44 (Equation 13-6 or 13-7) $P_{FM} =$ 0.753 using Equation (Exhibit 13-6) $V_{12} =$ 4524 pc/h V_3 or V_{av34} 1481 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☒ Yes ☐ No If Yes, $V_{12a} =$ 4524 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ $L_{EQ} =$ (Equation 13-12 or 13-13) $P_{FD} =$ using Equation (Exhibit 13-7) $V_{12} =$ pc/h V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☐ Yes ☐ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}	6987	Exhibit 13-8		No	V_F		Exhibit 13-8		
					$V_{FO} = V_F - V_R$		Exhibit 13-8		
					V_R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V_{R12}	5506	Exhibit 13-8	4600:All	Yes	V_{12}		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ 43.6 (pc/mi/ln) LOS = E (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ 1.232 (Exhibit 13-11) $S_R =$ 36.7 mph (Exhibit 13-11) $S_0 =$ 61.5 mph (Exhibit 13-11) $S =$ 40.1 mph (Exhibit 13-13)					$D_s =$ (Exhibit 13-12) $S_R =$ mph (Exhibit 13-12) $S_0 =$ mph (Exhibit 13-12) $S =$ mph (Exhibit 13-13)				

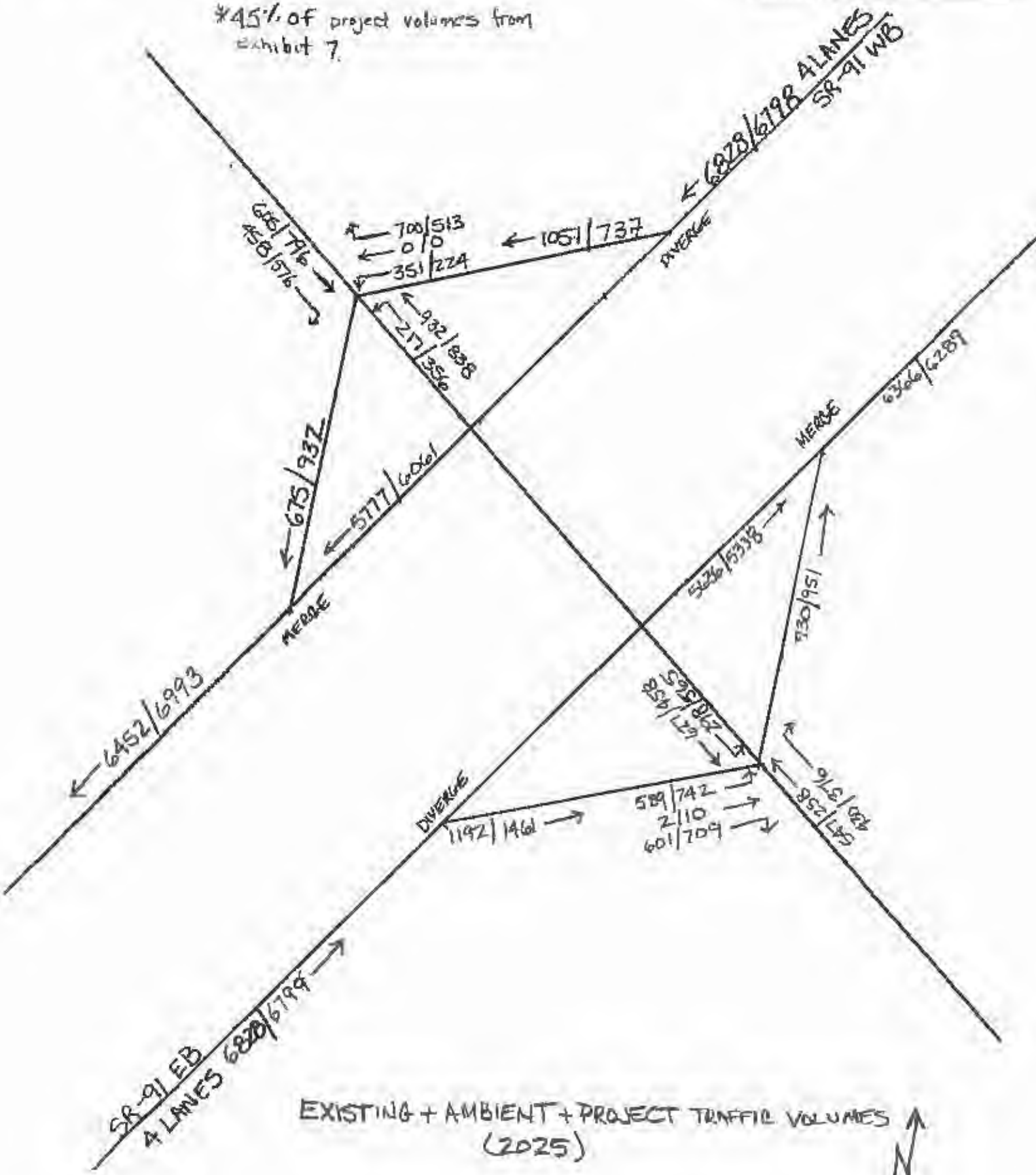
RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		REC		Freeway/Dir of Travel		SR 91 Westbound			
Agency or Company		Rick Engineering Company		Junction		Adams Street			
Date Performed		4/1/2016		Jurisdiction		Caltrans			
Analysis Time Period		AM Peak Hour		Analysis Year		Existing + Ambient (Year 2025)			
Project Description California Baptist University									
Inputs									
Upstream Adj Ramp ☒ Yes ☒ On ☐ No ☐ Off L _{up} = 2400 ft V _u = 655 veh/h		Freeway Number of Lanes, N 4				Downstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off L _{down} = ft V _D = veh/h			
		Ramp Number of Lanes, N 2							
		Acceleration Lane Length, L _A							
		Deceleration Lane Length L _D 0							
		Freeway Volume, V _F 5779							
		Ramp Volume, V _R 947							
Freeway Free-Flow Speed, S _{FF} 65.0									
Ramp Free-Flow Speed, S _{FR} 35.0									
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	5779	0.90	Level	2	1	0.988	1.00	6498	
Ramp	947	0.90	Level	2	1	0.988	1.00	1065	
UpStream	655	0.90	Level	2	1	0.988	1.00	737	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v₁₂					Estimation of v₁₂				
V ₁₂ = V _F (P _{FM}) L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? ☐ Yes ☐ No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 ☐ Yes ☐ No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					V ₁₂ = V _R + (V _F - V _R)P _{FD} L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.260 using Equation (Exhibit 13-7) V ₁₂ = 2478 pc/h V ₃ or V _{av34} 2010 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? ☐ Yes ☒ No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 ☒ Yes ☐ No If Yes, V _{12a} = 2599 pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	6498	Exhibit 13-8	9400	No
				V _{FO} = V _F - V _R	5433	Exhibit 13-8	9400	No	
				V _R	1065	Exhibit 13-10	4000	No	
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}		Exhibit 13-8			V ₁₂	2478	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
D _R = 5.475 + 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					D _R = 4.252 + 0.0086 V ₁₂ - 0.009 L _D D _R = 13.1 (pc/mi/ln) LOS = B (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = (Exhibit 13-11) S _R = mph (Exhibit 13-11) S ₀ = mph (Exhibit 13-11) S = mph (Exhibit 13-13)					D _S = 0.524 (Exhibit 13-12) S _R = 53.0 mph (Exhibit 13-12) S ₀ = 67.6 mph (Exhibit 13-12) S = 60.9 mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		REC		Freeway/Dir of Travel		SR 91 Westbound			
Agency or Company		Rick Engineering Company		Junction		Adams Street			
Date Performed		4/1/2016		Jurisdiction		Caltrans			
Analysis Time Period		AM Peak Hour		Analysis Year		Existing + Ambient (Year 2025)			
Project Description California Baptist University									
Inputs									
Upstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{up} =$ ft $V_u =$ veh/h		Freeway Number of Lanes, N 4				Downstream Adj Ramp ☒ Yes ☒ On ☐ No ☐ Off $L_{down} =$ 2400 ft $V_D =$ 947 veh/h			
		Ramp Number of Lanes, N 1							
		Acceleration Lane Length, L_A 1500							
		Deceleration Lane Length L_D							
		Freeway Volume, V_F 5779							
		Ramp Volume, V_R 655							
Freeway Free-Flow Speed, S_{FF} 65.0				Ramp Free-Flow Speed, S_{FR} 35.0					
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	5779	0.90	Level	2	1	0.988	1.00	6498	
Ramp	655	0.90	Level	2	1	0.988	1.00	737	
UpStream									
DownStream	947	0.90	Level	2	1	0.988	1.00	1065	
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$ $L_{EQ} =$ (Equation 13-6 or 13-7) $P_{FM} =$ 0.126 using Equation (Exhibit 13-6) $V_{12} =$ 817 pc/h V_3 or V_{av34} 2840 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☒ Yes ☐ No Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☒ Yes ☐ No If Yes, $V_{12a} =$ 2599 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ $L_{EQ} =$ (Equation 13-12 or 13-13) $P_{FD} =$ using Equation (Exhibit 13-7) $V_{12} =$ pc/h V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☐ Yes ☐ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}	7235	Exhibit 13-8		No	V_F		Exhibit 13-8		
					$V_{FO} = V_F - V_R$		Exhibit 13-8		
					V_R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V_{R12}	3336	Exhibit 13-8	4600:All	No	V_{12}		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ 21.8 (pc/mi/ln) LOS = C (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ 0.326 (Exhibit 13-11) $S_R =$ 57.5 mph (Exhibit 13-11) $S_0 =$ 59.8 mph (Exhibit 13-11) $S =$ 58.7 mph (Exhibit 13-13)					$D_s =$ (Exhibit 13-12) $S_R =$ mph (Exhibit 13-12) $S_0 =$ mph (Exhibit 13-12) $S =$ mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		REC		Freeway/Dir of Travel		SR 91 Westbound			
Agency or Company		Rick Engineering Company		Junction		Adams Street			
Date Performed		4/1/2016		Jurisdiction		Caltrans			
Analysis Time Period		PM Peak Hour		Analysis Year		Existing + Ambient (Year 2025)			
Project Description California Baptist University									
Inputs									
Upstream Adj Ramp ☒ Yes ☒ On ☐ No ☐ Off L _{up} = 2400 ft V _u = 855 veh/h		Freeway Number of Lanes, N 4				Downstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off L _{down} = ft V _D = veh/h			
		Ramp Number of Lanes, N 2							
		Acceleration Lane Length, L _A							
		Deceleration Lane Length L _D 0							
		Freeway Volume, V _F 6063							
		Ramp Volume, V _R 663							
Freeway Free-Flow Speed, S _{FF} 65.0									
Ramp Free-Flow Speed, S _{FR} 35.0									
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	6063	0.90	Level	2	1	0.988	1.00	6818	
Ramp	663	0.90	Level	2	1	0.988	1.00	746	
UpStream	855	0.90	Level	2	1	0.988	1.00	961	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v₁₂					Estimation of v₁₂				
V ₁₂ = V _F (P _{FM}) L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? ☐ Yes ☐ No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 ☐ Yes ☐ No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					V ₁₂ = V _R + (V _F - V _R)P _{FD} L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.260 using Equation (Exhibit 13-7) V ₁₂ = 2325 pc/h V ₃ or V _{av34} 2246 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? ☐ Yes ☒ No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 ☒ Yes ☐ No If Yes, V _{12a} = 2727 pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	6818	Exhibit 13-8	9400	No
				V _{FO} = V _F - V _R	6072	Exhibit 13-8	9400	No	
				V _R	746	Exhibit 13-10	4000	No	
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}		Exhibit 13-8			V ₁₂	2325	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
D _R = 5.475 + 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					D _R = 4.252 + 0.0086 V ₁₂ - 0.009 L _D D _R = 14.2 (pc/mi/ln) LOS = B (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = (Exhibit 13-11) S _R = mph (Exhibit 13-11) S ₀ = mph (Exhibit 13-11) S = mph (Exhibit 13-13)					D _S = 0.495 (Exhibit 13-12) S _R = 53.6 mph (Exhibit 13-12) S ₀ = 67.2 mph (Exhibit 13-12) S = 61.0 mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		REC		Freeway/Dir of Travel		SR 91 Westbound			
Agency or Company		Rick Engineering Company		Junction		Adams Street			
Date Performed		4/1/2016		Jurisdiction		Caltrans			
Analysis Time Period		PM Peak Hour		Analysis Year		Existing + Ambient (Year 2025)			
Project Description California Baptist University									
Inputs									
Upstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{up} =$ ft $V_u =$ veh/h		Freeway Number of Lanes, N 4				Downstream Adj Ramp ☒ Yes ☒ On ☐ No ☐ Off $L_{down} =$ 2400 ft $V_D =$ 663 veh/h			
		Ramp Number of Lanes, N 1							
		Acceleration Lane Length, L_A 1500							
		Deceleration Lane Length L_D							
		Freeway Volume, V_F 6063							
		Ramp Volume, V_R 855							
Freeway Free-Flow Speed, S_{FF} 65.0				Ramp Free-Flow Speed, S_{FR} 35.0					
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	6063	0.90	Level	2	1	0.988	1.00	6818	
Ramp	855	0.90	Level	2	1	0.988	1.00	961	
UpStream									
DownStream	663	0.90	Level	2	1	0.988	1.00	746	
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$ $L_{EQ} =$ (Equation 13-6 or 13-7) $P_{FM} =$ 0.098 using Equation (Exhibit 13-6) $V_{12} =$ 666 pc/h V_3 or V_{av34} 3076 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☒ Yes ☐ No Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☒ Yes ☐ No If Yes, $V_{12a} =$ 2727 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ $L_{EQ} =$ (Equation 13-12 or 13-13) $P_{FD} =$ using Equation (Exhibit 13-7) $V_{12} =$ pc/h V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☐ Yes ☐ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}	7779	Exhibit 13-8		No	V_F		Exhibit 13-8		
					$V_{FO} = V_F - V_R$		Exhibit 13-8		
					V_R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V_{R12}	3688	Exhibit 13-8	4600:All	No	V_{12}		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ 24.4 (pc/mi/ln) LOS = C (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ 0.372 (Exhibit 13-11) $S_R =$ 56.4 mph (Exhibit 13-11) $S_0 =$ 59.4 mph (Exhibit 13-11) $S =$ 58.0 mph (Exhibit 13-13)					$D_s =$ (Exhibit 13-12) $S_R =$ mph (Exhibit 13-12) $S_0 =$ mph (Exhibit 13-12) $S =$ mph (Exhibit 13-13)				

*45% of project volumes from exhibit 7.



RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		REC		Freeway/Dir of Travel		SR 91 Eastbound			
Agency or Company		Rick Engineering Company		Junction		Adams Street			
Date Performed		4/1/2016		Jurisdiction		Caltrans			
Analysis Time Period		AM Peak Hour		Analysis Year		Ex+Ambient+Project (Year 2025)			
Project Description California Baptist University									
Inputs									
Upstream Adj Ramp ☒ Yes ☒ On ☐ No ☐ Off L _{up} = 2000 ft V _u = 730 veh/h		Freeway Number of Lanes, N				4		Downstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off L _{down} = ft V _D = veh/h	
		Ramp Number of Lanes, N				2			
		Acceleration Lane Length, L _A							
		Deceleration Lane Length L _D				0			
		Freeway Volume, V _F				5636			
		Ramp Volume, V _R				1192			
Freeway Free-Flow Speed, S _{FF}				65.0					
Ramp Free-Flow Speed, S _{FR}				35.0					
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	5636	0.90	Level	2	1	0.988	1.00	6337	
Ramp	1192	0.90	Level	2	1	0.988	1.00	1340	
UpStream	730	0.90	Level	2	1	0.988	1.00	821	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v₁₂					Estimation of v₁₂				
V ₁₂ = V _F (P _{FM}) L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? ☐ Yes ☐ No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 ☐ Yes ☐ No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					V ₁₂ = V _R + (V _F - V _R)P _{FD} L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.260 using Equation (Exhibit 13-7) V ₁₂ = 2639 pc/h V ₃ or V _{av34} 1849 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? ☐ Yes ☒ No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 ☐ Yes ☒ No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	6337	Exhibit 13-8	9400	No
				V _{FO} = V _F - V _R	4997	Exhibit 13-8	9400	No	
				V _R	1340	Exhibit 13-10	4000	No	
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}		Exhibit 13-8			V ₁₂	2639	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
D _R = 5.475 + 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					D _R = 4.252 + 0.0086 V ₁₂ - 0.009 L _D D _R = 13.4 (pc/mi/ln) LOS = B (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = (Exhibit 13-11) S _R = mph (Exhibit 13-11) S ₀ = mph (Exhibit 13-11) S = mph (Exhibit 13-13)					D _S = 0.549 (Exhibit 13-12) S _R = 52.4 mph (Exhibit 13-12) S ₀ = 68.0 mph (Exhibit 13-12) S = 60.5 mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		REC		Freeway/Dir of Travel		SR 91 Eastbound			
Agency or Company		Rick Engineering Company		Junction		Adams Street			
Date Performed		4/1/2016		Jurisdiction		Caltrans			
Analysis Time Period		AM Peak Hour		Analysis Year		Ex+Ambient+Project (Year 2025)			
Project Description California Baptist University									
Inputs									
Upstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{up} =$ ft $V_u =$ veh/h		Freeway Number of Lanes, N 3				Downstream Adj Ramp ☒ Yes ☐ On ☐ No ☒ Off $L_{down} =$ 2000 ft $V_D =$ 1192 veh/h			
		Ramp Number of Lanes, N 1							
		Acceleration Lane Length, L_A 700							
		Deceleration Lane Length L_D							
		Freeway Volume, V_F 5636							
		Ramp Volume, V_R 730							
Freeway Free-Flow Speed, S_{FF} 65.0									
Ramp Free-Flow Speed, S_{FR} 35.0									
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	5636	0.90	Level	2	1	0.988	1.00	6337	
Ramp	730	0.90	Level	2	1	0.988	1.00	821	
UpStream									
DownStream	1192	0.90	Level	2	1	0.988	1.00	1340	
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$ $L_{EQ} =$ 7262.87 (Equation 13-6 or 13-7) $P_{FM} =$ 0.725 using Equation (Exhibit 13-6) $V_{12} =$ 4593 pc/h V_3 or V_{av34} 1744 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☒ Yes ☐ No If Yes, $V_{12a} =$ 4593 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ $L_{EQ} =$ (Equation 13-12 or 13-13) $P_{FD} =$ using Equation (Exhibit 13-7) $V_{12} =$ pc/h V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☐ Yes ☐ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}	7158	Exhibit 13-8		Yes	V_F		Exhibit 13-8		
					$V_{FO} = V_F - V_R$		Exhibit 13-8		
					V_R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V_{R12}	5414	Exhibit 13-8	4600:All	Yes	V_{12}		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ 42.9 (pc/mi/ln) LOS = F (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ 1.148 (Exhibit 13-11) $S_R =$ 38.6 mph (Exhibit 13-11) $S_0 =$ 60.5 mph (Exhibit 13-11) $S =$ 42.3 mph (Exhibit 13-13)					$D_s =$ (Exhibit 13-12) $S_R =$ mph (Exhibit 13-12) $S_0 =$ mph (Exhibit 13-12) $S =$ mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET										
General Information					Site Information					
Analyst		REC		Freeway/Dir of Travel		SR 91 Eastbound				
Agency or Company		Rick Engineering Company		Junction		Adams Street				
Date Performed		4/1/2016		Jurisdiction		Caltrans				
Analysis Time Period		PM Peak Hour		Analysis Year		Ex+Ambient+Project (Year 2025)				
Project Description California Baptist University										
Inputs										
Upstream Adj Ramp ☒ Yes ☒ On ☐ No ☐ Off L _{up} = 2000 ft V _u = 951 veh/h		Freeway Number of Lanes, N 4 Ramp Number of Lanes, N 2 Acceleration Lane Length, L _A Deceleration Lane Length L _D 0 Freeway Volume, V _F 5338 Ramp Volume, V _R 1461 Freeway Free-Flow Speed, S _{FF} 65.0 Ramp Free-Flow Speed, S _{FR} 35.0				Downstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off L _{down} = ft V _D = veh/h				
Conversion to pc/h Under Base Conditions										
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p		
Freeway	5338	0.90	Level	2	1	0.988	1.00	6002		
Ramp	1461	0.90	Level	2	1	0.988	1.00	1643		
UpStream	951	0.90	Level	2	1	0.988	1.00	1069		
DownStream										
Merge Areas					Diverge Areas					
Estimation of v₁₂					Estimation of v₁₂					
$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? ☐ Yes ☐ No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 ☐ Yes ☐ No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.260 using Equation (Exhibit 13-7) V ₁₂ = 2776 pc/h V ₃ or V _{av34} 1613 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? ☐ Yes ☒ No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 ☐ Yes ☒ No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					
Capacity Checks					Capacity Checks					
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?	
V _{FO}		Exhibit 13-8				V _F	6002	Exhibit 13-8	9400	No
					V _{FO} = V _F - V _R	4359	Exhibit 13-8	9400	No	
					V _R	1643	Exhibit 13-10	4000	No	
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area					
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?	
	V _{R12}		Exhibit 13-8			V ₁₂	2776	Exhibit 13-8	4400:All No	
Level of Service Determination (if not F)					Level of Service Determination (if not F)					
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = 14.6 (pc/mi/ln) LOS = B (Exhibit 13-2)					
Speed Determination					Speed Determination					
M _S = (Exhibit 13-11) S _R = mph (Exhibit 13-11) S ₀ = mph (Exhibit 13-11) S = mph (Exhibit 13-13)					D _S = 0.576 (Exhibit 13-12) S _R = 51.8 mph (Exhibit 13-12) S ₀ = 68.9 mph (Exhibit 13-12) S = 59.8 mph (Exhibit 13-13)					

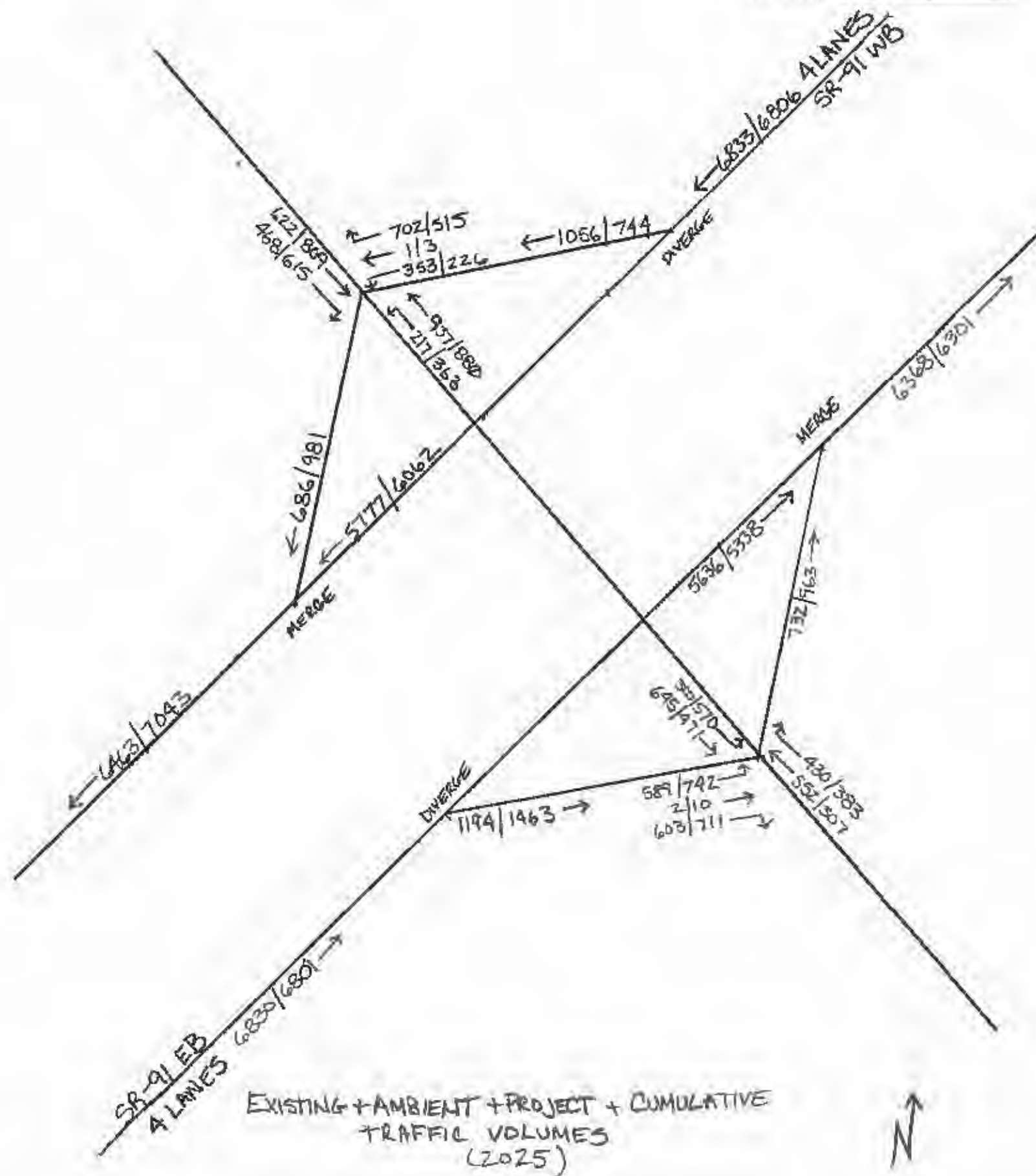
RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		REC		Freeway/Dir of Travel		SR 91 Eastbound			
Agency or Company		Rick Engineering Company		Junction		Adams Street			
Date Performed		4/1/2016		Jurisdiction		Caltrans			
Analysis Time Period		PM Peak Hour		Analysis Year		Ex+Ambient+Project (Year 2025)			
Project Description California Baptist University									
Inputs									
Upstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{up} =$ ft $V_u =$ veh/h		Freeway Number of Lanes, N 3				Downstream Adj Ramp ☒ Yes ☐ On ☐ No ☒ Off $L_{down} =$ 2000 ft $V_D =$ 1461 veh/h			
		Ramp Number of Lanes, N 1							
		Acceleration Lane Length, L_A 700							
		Deceleration Lane Length L_D							
		Freeway Volume, V_F 5338							
		Ramp Volume, V_R 951							
Freeway Free-Flow Speed, S_{FF} 65.0				Ramp Free-Flow Speed, S_{FR} 35.0					
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	5338	0.90	Level	2	1	0.988	1.00	6002	
Ramp	951	0.90	Level	2	1	0.988	1.00	1069	
UpStream									
DownStream	1461	0.90	Level	2	1	0.988	1.00	1643	
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$ $L_{EQ} =$ 8905.15 (Equation 13-6 or 13-7) $P_{FM} =$ 0.765 using Equation (Exhibit 13-6) $V_{12} =$ 4589 pc/h V_3 or V_{av34} 1413 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☐ Yes ☒ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ $L_{EQ} =$ (Equation 13-12 or 13-13) $P_{FD} =$ using Equation (Exhibit 13-7) $V_{12} =$ pc/h V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☐ Yes ☐ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}	7071	Exhibit 13-8		Yes	V_F		Exhibit 13-8		
					$V_{FO} = V_F - V_R$		Exhibit 13-8		
					V_R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V_{R12}	5658	Exhibit 13-8	4600:All	Yes	V_{12}		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ 44.7 (pc/mi/ln) LOS = F (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ 1.390 (Exhibit 13-11) $S_R =$ 33.0 mph (Exhibit 13-11) $S_0 =$ 61.7 mph (Exhibit 13-11) $S =$ 36.4 mph (Exhibit 13-13)					$D_s =$ (Exhibit 13-12) $S_R =$ mph (Exhibit 13-12) $S_0 =$ mph (Exhibit 13-12) $S =$ mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET										
General Information					Site Information					
Analyst		REC		Freeway/Dir of Travel		SR 91 Westbound				
Agency or Company		Rick Engineering Company		Junction		Adams Street				
Date Performed		4/1/2016		Jurisdiction		Caltrans				
Analysis Time Period		AM Peak Hour		Analysis Year		Ex+Ambient+Project (Year 2025)				
Project Description California Baptist University										
Inputs										
Upstream Adj Ramp ☒ Yes ☒ On ☐ No ☐ Off L _{up} = 2400 ft V _u = 675 veh/h		Freeway Number of Lanes, N 4 Ramp Number of Lanes, N 2 Acceleration Lane Length, L _A Deceleration Lane Length L _D 0 Freeway Volume, V _F 5777 Ramp Volume, V _R 1051 Freeway Free-Flow Speed, S _{FF} 65.0 Ramp Free-Flow Speed, S _{FR} 35.0				Downstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off L _{down} = ft V _D = veh/h				
Conversion to pc/h Under Base Conditions										
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p		
Freeway	5777	0.90	Level	2	1	0.988	1.00	6496		
Ramp	1051	0.90	Level	2	1	0.988	1.00	1182		
UpStream	675	0.90	Level	2	1	0.988	1.00	759		
DownStream										
Merge Areas					Diverge Areas					
Estimation of v₁₂					Estimation of v₁₂					
V ₁₂ = V _F (P _{FM}) L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? ☐ Yes ☐ No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 ☐ Yes ☐ No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					V ₁₂ = V _R + (V _F - V _R)P _{FD} L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.260 using Equation (Exhibit 13-7) V ₁₂ = 2564 pc/h V ₃ or V _{av34} 1966 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? ☐ Yes ☒ No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 ☒ Yes ☐ No If Yes, V _{12a} = 2598 pc/h (Equation 13-16, 13-18, or 13-19)					
Capacity Checks					Capacity Checks					
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?	
V _{FO}		Exhibit 13-8				V _F	6496	Exhibit 13-8	9400	No
					V _{FO} = V _F - V _R	5314	Exhibit 13-8	9400	No	
					V _R	1182	Exhibit 13-10	4000	No	
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area					
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?	
	V _{R12}	Exhibit 13-8				V ₁₂	2564	Exhibit 13-8	4400:All No	
Level of Service Determination (if not F)					Level of Service Determination (if not F)					
D _R = 5.475 + 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					D _R = 4.252 + 0.0086 V ₁₂ - 0.009 L _D D _R = 13.1 (pc/mi/ln) LOS = B (Exhibit 13-2)					
Speed Determination					Speed Determination					
M _S = (Exhibit 13-11) S _R = mph (Exhibit 13-11) S ₀ = mph (Exhibit 13-11) S = mph (Exhibit 13-13)					D _S = 0.534 (Exhibit 13-12) S _R = 52.7 mph (Exhibit 13-12) S ₀ = 67.6 mph (Exhibit 13-12) S = 60.7 mph (Exhibit 13-13)					

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		REC		Freeway/Dir of Travel		SR 91 Westbound			
Agency or Company		Rick Engineering Company		Junction		Adams Street			
Date Performed		4/1/2016		Jurisdiction		Caltrans			
Analysis Time Period		AM Peak Hour		Analysis Year		Ex+Ambient+Project (Year 2025)			
Project Description California Baptist University									
Inputs									
Upstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{up} =$ ft $V_u =$ veh/h		Freeway Number of Lanes, N 4				Downstream Adj Ramp ☒ Yes ☒ On ☐ No ☐ Off $L_{down} =$ 2400 ft $V_D =$ 1051 veh/h			
		Ramp Number of Lanes, N 1							
		Acceleration Lane Length, L_A 1500							
		Deceleration Lane Length L_D							
		Freeway Volume, V_F 5777							
		Ramp Volume, V_R 675							
Freeway Free-Flow Speed, S_{FF} 65.0									
Ramp Free-Flow Speed, S_{FR} 35.0									
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	5777	0.90	Level	2	1	0.988	1.00	6496	
Ramp	675	0.90	Level	2	1	0.988	1.00	759	
UpStream									
DownStream	1051	0.90	Level	2	1	0.988	1.00	1182	
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$ $L_{EQ} =$ (Equation 13-6 or 13-7) $P_{FM} =$ 0.123 using Equation (Exhibit 13-6) $V_{12} =$ 799 pc/h V_3 or V_{av34} 2848 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☒ Yes ☐ No Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☒ Yes ☐ No If Yes, $V_{12a} =$ 2598 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ $L_{EQ} =$ (Equation 13-12 or 13-13) $P_{FD} =$ using Equation (Exhibit 13-7) $V_{12} =$ pc/h V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☐ Yes ☐ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}	7255	Exhibit 13-8		No	V_F		Exhibit 13-8		
					$V_{FO} = V_F - V_R$		Exhibit 13-8		
					V_R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V_{R12}	3357	Exhibit 13-8	4600:All	No	V_{12}		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ 21.9 (pc/mi/ln) LOS = C (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ 0.328 (Exhibit 13-11) $S_R =$ 57.5 mph (Exhibit 13-11) $S_0 =$ 59.8 mph (Exhibit 13-11) $S =$ 58.7 mph (Exhibit 13-13)					$D_s =$ (Exhibit 13-12) $S_R =$ mph (Exhibit 13-12) $S_0 =$ mph (Exhibit 13-12) $S =$ mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET										
General Information					Site Information					
Analyst		REC		Freeway/Dir of Travel		SR 91 Westbound				
Agency or Company		Rick Engineering Company		Junction		Adams Street				
Date Performed		4/1/2016		Jurisdiction		Caltrans				
Analysis Time Period		AM Peak Hour		Analysis Year		Ex+Ambient+Project (Year 2025)				
Project Description California Baptist University										
Inputs										
Upstream Adj Ramp ☒ Yes ☒ On ☐ No ☐ Off L _{up} = 2400 ft V _u = 932 veh/h		Freeway Number of Lanes, N 4 Ramp Number of Lanes, N 2 Acceleration Lane Length, L _A Deceleration Lane Length L _D 0 Freeway Volume, V _F 6061 Ramp Volume, V _R 737 Freeway Free-Flow Speed, S _{FF} 65.0 Ramp Free-Flow Speed, S _{FR} 35.0				Downstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off L _{down} = ft V _D = veh/h				
Conversion to pc/h Under Base Conditions										
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p		
Freeway	6061	0.90	Level	2	1	0.988	1.00	6815		
Ramp	737	0.90	Level	2	1	0.988	1.00	829		
UpStream	932	0.90	Level	2	1	0.988	1.00	1048		
DownStream										
Merge Areas					Diverge Areas					
Estimation of v₁₂					Estimation of v₁₂					
V ₁₂ = V _F (P _{FM}) L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? ☐ Yes ☐ No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 ☐ Yes ☐ No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					V ₁₂ = V _R + (V _F - V _R)P _{FD} L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.260 using Equation (Exhibit 13-7) V ₁₂ = 2385 pc/h V ₃ or V _{av34} 2215 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? ☐ Yes ☒ No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 ☒ Yes ☐ No If Yes, V _{12a} = 2726 pc/h (Equation 13-16, 13-18, or 13-19)					
Capacity Checks					Capacity Checks					
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?	
V _{FO}		Exhibit 13-8				V _F	6815	Exhibit 13-8	9400	No
					V _{FO} = V _F - V _R	5986	Exhibit 13-8	9400	No	
					V _R	829	Exhibit 13-10	4000	No	
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area					
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?	
	V _{R12}		Exhibit 13-8			V ₁₂	2385	Exhibit 13-8	4400:All No	
Level of Service Determination (if not F)					Level of Service Determination (if not F)					
D _R = 5.475 + 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					D _R = 4.252 + 0.0086 V ₁₂ - 0.009 L _D D _R = 14.2 (pc/mi/ln) LOS = B (Exhibit 13-2)					
Speed Determination					Speed Determination					
M _S = (Exhibit 13-11) S _R = mph (Exhibit 13-11) S ₀ = mph (Exhibit 13-11) S = mph (Exhibit 13-13)					D _S = 0.503 (Exhibit 13-12) S _R = 53.4 mph (Exhibit 13-12) S ₀ = 67.2 mph (Exhibit 13-12) S = 60.9 mph (Exhibit 13-13)					

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		REC		Freeway/Dir of Travel		SR 91 Westbound			
Agency or Company		Rick Engineering Company		Junction		Adams Street			
Date Performed		4/1/2016		Jurisdiction		Caltrans			
Analysis Time Period		PM Peak Hour		Analysis Year		Ex+Ambient+Project (Year 2025)			
Project Description California Baptist University									
Inputs									
Upstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{up} =$ ft $V_u =$ veh/h		Freeway Number of Lanes, N 4				Downstream Adj Ramp ☒ Yes ☒ On ☐ No ☐ Off $L_{down} =$ 2400 ft $V_D =$ 737 veh/h			
		Ramp Number of Lanes, N 1							
		Acceleration Lane Length, L_A 1500							
		Deceleration Lane Length L_D							
		Freeway Volume, V_F 6061							
		Ramp Volume, V_R 932							
Freeway Free-Flow Speed, S_{FF} 65.0				Ramp Free-Flow Speed, S_{FR} 35.0					
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	6061	0.90	Level	2	1	0.988	1.00	6815	
Ramp	932	0.90	Level	2	1	0.988	1.00	1048	
UpStream									
DownStream	737	0.90	Level	2	1	0.988	1.00	829	
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$ $L_{EQ} =$ (Equation 13-6 or 13-7) $P_{FM} =$ 0.087 using Equation (Exhibit 13-6) $V_{12} =$ 592 pc/h V_3 or V_{av34} 3111 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☒ Yes ☐ No Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☒ Yes ☐ No If Yes, $V_{12a} =$ 2726 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ $L_{EQ} =$ (Equation 13-12 or 13-13) $P_{FD} =$ using Equation (Exhibit 13-7) $V_{12} =$ pc/h V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☐ Yes ☐ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}	7863	Exhibit 13-8		No	V_F		Exhibit 13-8		
					$V_{FO} = V_F - V_R$		Exhibit 13-8		
					V_R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V_{R12}	3774	Exhibit 13-8	4600:All	No	V_{12}		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ 25.0 (pc/mi/ln) LOS = C (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ 0.386 (Exhibit 13-11) $S_R =$ 56.1 mph (Exhibit 13-11) $S_0 =$ 59.4 mph (Exhibit 13-11) $S =$ 57.8 mph (Exhibit 13-13)					$D_s =$ (Exhibit 13-12) $S_R =$ mph (Exhibit 13-12) $S_0 =$ mph (Exhibit 13-12) $S =$ mph (Exhibit 13-13)				



RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		REC		Freeway/Dir of Travel		SR 91 Eastbound			
Agency or Company		Rick Engineering Company		Junction		Adams Street			
Date Performed		4/1/2016		Jurisdiction		Caltrans			
Analysis Time Period		AM Peak Hour		Analysis Year		Ex+Ambient+Cum+Proj(Year 2025)			
Project Description California Baptist University									
Inputs									
Upstream Adj Ramp ☒ Yes ☒ On ☐ No ☐ Off L _{up} = 2000 ft V _u = 732 veh/h		Freeway Number of Lanes, N				4		Downstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off L _{down} = ft V _D = veh/h	
		Ramp Number of Lanes, N				2			
		Acceleration Lane Length, L _A							
		Deceleration Lane Length L _D				0			
		Freeway Volume, V _F				5636			
		Ramp Volume, V _R				1194			
Freeway Free-Flow Speed, S _{FF}				65.0					
Ramp Free-Flow Speed, S _{FR}				35.0					
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	5636	0.90	Level	2	1	0.988	1.00	6337	
Ramp	1194	0.90	Level	2	1	0.988	1.00	1343	
UpStream	732	0.90	Level	2	1	0.988	1.00	823	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v₁₂					Estimation of v₁₂				
V ₁₂ = V _F (P _{FM}) L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? ☐ Yes ☐ No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 ☐ Yes ☐ No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					V ₁₂ = V _R + (V _F - V _R)P _{FD} L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.260 using Equation (Exhibit 13-7) V ₁₂ = 2641 pc/h V ₃ or V _{av34} 1848 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? ☐ Yes ☒ No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 ☐ Yes ☒ No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	6337	Exhibit 13-8	9400	No
				V _{FO} = V _F - V _R	4994	Exhibit 13-8	9400	No	
				V _R	1343	Exhibit 13-10	4000	No	
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}		Exhibit 13-8			V ₁₂	2641	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
D _R = 5.475 + 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A					D _R = 4.252 + 0.0086 V ₁₂ - 0.009 L _D				
D _R = (pc/mi/ln)					D _R = 13.5 (pc/mi/ln)				
LOS = (Exhibit 13-2)					LOS = B (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = (Exhibit 13-11)					D _S = 0.549 (Exhibit 13-12)				
S _R = mph (Exhibit 13-11)					S _R = 52.4 mph (Exhibit 13-12)				
S ₀ = mph (Exhibit 13-11)					S ₀ = 68.0 mph (Exhibit 13-12)				
S = mph (Exhibit 13-13)					S = 60.5 mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	REC		Freeway/Dir of Travel		SR 91 Eastbound				
Agency or Company	Rick Engineering Company		Junction		Adams Street				
Date Performed	4/1/2016		Jurisdiction		Caltrans				
Analysis Time Period	AM Peak Hour		Analysis Year		Ex+Ambient+Cum+Proj(Year 2025)				
Project Description California Baptist University									
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N		3		Downstream Adj Ramp				
☐ Yes ☐ On	Ramp Number of Lanes, N		1		☒ Yes ☐ On				
☒ No ☐ Off	Acceleration Lane Length, L_A		700		☐ No ☒ Off				
$L_{up} =$ ft	Deceleration Lane Length L_D				$L_{down} =$ 2000 ft				
$V_u =$ veh/h	Freeway Volume, V_F		5636		$V_D =$ 1194 veh/h				
	Ramp Volume, V_R		732						
	Freeway Free-Flow Speed, S_{FF}		65.0						
	Ramp Free-Flow Speed, S_{FR}		35.0						
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	5636	0.90	Level	2	1	0.988	1.00	6337	
Ramp	732	0.90	Level	2	1	0.988	1.00	823	
UpStream									
DownStream	1194	0.90	Level	2	1	0.988	1.00	1343	
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$					$V_{12} = V_R + (V_F - V_R)P_{FD}$				
$L_{EQ} = 7279.13$ (Equation 13-6 or 13-7)					$L_{EQ} =$ (Equation 13-12 or 13-13)				
$P_{FM} = 0.725$ using Equation (Exhibit 13-6)					$P_{FD} =$ using Equation (Exhibit 13-7)				
$V_{12} = 4595$ pc/h					$V_{12} =$ pc/h				
V_3 or $V_{av34} = 1742$ pc/h (Equation 13-14 or 13-17)					V_3 or $V_{av34} =$ pc/h (Equation 13-14 or 13-17)				
Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No					Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No				
Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☒ Yes ☐ No					Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☐ Yes ☐ No				
If Yes, $V_{12a} = 4595$ pc/h (Equation 13-16, 13-18, or 13-19)					If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}	7160	Exhibit 13-8		Yes	V_F		Exhibit 13-8		
					$V_{FO} = V_F - V_R$		Exhibit 13-8		
					V_R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V_{R12}	5418	Exhibit 13-8	4600:All	Yes	V_{12}		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$				
$D_R = 43.0$ (pc/mi/ln)					$D_R =$ (pc/mi/ln)				
LOS = F (Exhibit 13-2)					LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S = 1.151$ (Exhibit 13-11)					$D_S =$ (Exhibit 13-12)				
$S_R = 38.5$ mph (Exhibit 13-11)					$S_R =$ mph (Exhibit 13-12)				
$S_0 = 60.5$ mph (Exhibit 13-11)					$S_0 =$ mph (Exhibit 13-12)				
$S = 42.3$ mph (Exhibit 13-13)					$S =$ mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		REC		Freeway/Dir of Travel		SR 91 Eastbound			
Agency or Company		Rick Engineering Company		Junction		Adams Street			
Date Performed		4/1/2016		Jurisdiction		Caltrans			
Analysis Time Period		PM Peak Hour		Analysis Year		Ex+Ambient+Cum+Proj(Year 2025)			
Project Description California Baptist University									
Inputs									
Upstream Adj Ramp ☒ Yes ☒ On ☐ No ☐ Off $L_{up} =$ 2000 ft $V_u =$ 963 veh/h		Freeway Number of Lanes, N				4		Downstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{down} =$ ft $V_D =$ veh/h	
		Ramp Number of Lanes, N				2			
		Acceleration Lane Length, L_A							
		Deceleration Lane Length L_D				0			
		Freeway Volume, V_F				5338			
		Ramp Volume, V_R				1463			
Freeway Free-Flow Speed, S_{FF}				65.0					
Ramp Free-Flow Speed, S_{FR}				35.0					
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	5338	0.90	Level	2	1	0.988	1.00	6002	
Ramp	1463	0.90	Level	2	1	0.988	1.00	1645	
UpStream	963	0.90	Level	2	1	0.988	1.00	1083	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$ $L_{EQ} =$ (Equation 13-6 or 13-7) $P_{FM} =$ using Equation (Exhibit 13-6) $V_{12} =$ pc/h V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☐ Yes ☐ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ $L_{EQ} =$ (Equation 13-12 or 13-13) $P_{FD} =$ 0.260 using Equation (Exhibit 13-7) $V_{12} =$ 2778 pc/h V_3 or V_{av34} 1612 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☐ Yes ☒ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8			V_F	6002	Exhibit 13-8	9400	No
			$V_{FO} = V_F - V_R$	4357	Exhibit 13-8	9400	No		
			V_R	1645	Exhibit 13-10	4000	No		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8			V_{12}	2778	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ 14.6 (pc/mi/ln) LOS = B (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ (Exhibit 13-11) $S_R =$ mph (Exhibit 13-11) $S_0 =$ mph (Exhibit 13-11) $S =$ mph (Exhibit 13-13)					$D_s =$ 0.576 (Exhibit 13-12) $S_R =$ 51.8 mph (Exhibit 13-12) $S_0 =$ 68.9 mph (Exhibit 13-12) $S =$ 59.7 mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	REC		Freeway/Dir of Travel		SR 91 Eastbound				
Agency or Company	Rick Engineering Company		Junction		Adams Street				
Date Performed	4/1/2016		Jurisdiction		Caltrans				
Analysis Time Period	PM Peak Hour		Analysis Year		Ex+Ambient+Cum+Proj(Year 2025)				
Project Description California Baptist University									
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N		3		Downstream Adj Ramp				
☐ Yes ☐ On	Ramp Number of Lanes, N		1		☒ Yes ☐ On				
☒ No ☐ Off	Acceleration Lane Length, L_A		700		☐ No ☒ Off				
$L_{up} =$ ft	Deceleration Lane Length L_D				$L_{down} =$ 2000 ft				
$V_u =$ veh/h	Freeway Volume, V_F		5338		$V_D =$ 1463 veh/h				
	Ramp Volume, V_R		963						
	Freeway Free-Flow Speed, S_{FF}		65.0						
	Ramp Free-Flow Speed, S_{FR}		35.0						
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	5338	0.90	Level	2	1	0.988	1.00	6002	
Ramp	963	0.90	Level	2	1	0.988	1.00	1083	
UpStream									
DownStream	1463	0.90	Level	2	1	0.988	1.00	1645	
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$ $L_{EQ} = 8915.99$ (Equation 13-6 or 13-7) $P_{FM} = 0.765$ using Equation (Exhibit 13-6) $V_{12} = 4591$ pc/h V_3 or $V_{av34} = 1411$ pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☒ Yes ☐ No If Yes, $V_{12a} = 4591$ pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ $L_{EQ} =$ (Equation 13-12 or 13-13) $P_{FD} =$ using Equation (Exhibit 13-7) $V_{12} =$ pc/h V_3 or $V_{av34} =$ pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☐ Yes ☐ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}	7085	Exhibit 13-8		Yes	V_F		Exhibit 13-8		
					$V_{FO} = V_F - V_R$		Exhibit 13-8		
					V_R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V_{R12}	5674	Exhibit 13-8	4600:All	Yes	V_{12}		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R = 44.8$ (pc/mi/ln) LOS = F (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S = 1.408$ (Exhibit 13-11) $S_R = 32.6$ mph (Exhibit 13-11) $S_0 = 61.7$ mph (Exhibit 13-11) $S = 36.0$ mph (Exhibit 13-13)					$D_S =$ (Exhibit 13-12) $S_R =$ mph (Exhibit 13-12) $S_0 =$ mph (Exhibit 13-12) $S =$ mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	REC		Freeway/Dir of Travel		SR 91 Westbound				
Agency or Company	Rick Engineering Company		Junction		Adams Street				
Date Performed	4/1/2016		Jurisdiction		Caltrans				
Analysis Time Period	AM Peak Hour		Analysis Year		Ex+Ambient+Cum+Proj(Year 2025)				
Project Description California Baptist University									
Inputs									
Upstream Adj Ramp ☒ Yes ☒ On ☐ No ☐ Off L _{up} = 2400 ft V _u = 686 veh/h		Freeway Number of Lanes, N 4				Downstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off L _{down} = ft V _D = veh/h			
		Ramp Number of Lanes, N 2							
		Acceleration Lane Length, L _A							
		Deceleration Lane Length L _D 0							
		Freeway Volume, V _F 5777							
		Ramp Volume, V _R 1056							
		Freeway Free-Flow Speed, S _{FF} 65.0							
		Ramp Free-Flow Speed, S _{FR} 35.0							
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	5777	0.90	Level	2	1	0.988	1.00	6496	
Ramp	1056	0.90	Level	2	1	0.988	1.00	1187	
UpStream	686	0.90	Level	2	1	0.988	1.00	771	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v₁₂					Estimation of v₁₂				
$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? ☐ Yes ☐ No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 ☐ Yes ☐ No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.260 using Equation (Exhibit 13-7) V ₁₂ = 2567 pc/h V ₃ or V _{av34} = 1964 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? ☐ Yes ☒ No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 ☒ Yes ☐ No If Yes, V _{12a} = 2598 pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	6496	Exhibit 13-8	9400	No
				V _{FO} = V _F - V _R	5309	Exhibit 13-8	9400	No	
				V _R	1187	Exhibit 13-10	4000	No	
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}		Exhibit 13-8			V ₁₂	2567	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
D _R = 5.475 + 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A					D _R = 4.252 + 0.0086 V ₁₂ - 0.009 L _D				
D _R = (pc/mi/ln)					D _R = 13.1 (pc/mi/ln)				
LOS = (Exhibit 13-2)					LOS = B (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = (Exhibit 13-11)					D _S = 0.535 (Exhibit 13-12)				
S _R = mph (Exhibit 13-11)					S _R = 52.7 mph (Exhibit 13-12)				
S ₀ = mph (Exhibit 13-11)					S ₀ = 67.6 mph (Exhibit 13-12)				
S = mph (Exhibit 13-13)					S = 60.7 mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	REC		Freeway/Dir of Travel		SR 91 Westbound				
Agency or Company	Rick Engineering Company		Junction		Adams Street				
Date Performed	4/1/2016		Jurisdiction		Caltrans				
Analysis Time Period	AM Peak Hour		Analysis Year		Ex+Ambient+Cum+Proj(Year 2025)				
Project Description California Baptist University									
Inputs									
Upstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off		Freeway Number of Lanes, N			4		Downstream Adj Ramp ☒ Yes ☒ On ☐ No ☐ Off		
		Ramp Number of Lanes, N			1				
L _{up} = ft V _u = veh/h		Acceleration Lane Length, L _A			1500		L _{down} = 2400 ft V _D = 1056 veh/h		
		Deceleration Lane Length L _D							
		Freeway Volume, V _F			5777				
		Ramp Volume, V _R			686				
		Freeway Free-Flow Speed, S _{FF}			65.0				
		Ramp Free-Flow Speed, S _{FR}			35.0				
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	5777	0.90	Level	2	1	0.988	1.00	6496	
Ramp	686	0.90	Level	2	1	0.988	1.00	771	
UpStream									
DownStream	1056	0.90	Level	2	1	0.988	1.00	1187	
Merge Areas					Diverge Areas				
Estimation of v₁₂					Estimation of v₁₂				
V ₁₂ = V _F (P _{FM}) (Equation 13-6 or 13-7) P _{FM} = 0.121 using Equation (Exhibit 13-6) V ₁₂ = 789 pc/h V ₃ or V _{av34} = 2853 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? ☒ Yes ☐ No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 ☒ Yes ☐ No If Yes, V _{12a} = 2598 pc/h (Equation 13-16, 13-18, or 13-19)					V ₁₂ = V _R + (V _F - V _R)P _{FD} (Equation 13-12 or 13-13) P _{FD} = using Equation (Exhibit 13-7) V ₁₂ = pc/h V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? ☐ Yes ☐ No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 ☐ Yes ☐ No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}	7267	Exhibit 13-8		No	V _F		Exhibit 13-8		
					V _{FO} = V _F - V _R		Exhibit 13-8		
					V _R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}	3369	Exhibit 13-8	4600:All	No	V ₁₂		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
D _R = 5.475 + 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A D _R = 22.0 (pc/mi/ln) LOS = C (Exhibit 13-2)					D _R = 4.252 + 0.0086 V ₁₂ - 0.009 L _D D _R = (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = 0.329 (Exhibit 13-11) S _R = 57.4 mph (Exhibit 13-11) S ₀ = 59.8 mph (Exhibit 13-11) S = 58.7 mph (Exhibit 13-13)					D _S = (Exhibit 13-12) S _R = mph (Exhibit 13-12) S ₀ = mph (Exhibit 13-12) S = mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET											
General Information					Site Information						
Analyst		REC		Freeway/Dir of Travel		SR 91 Westbound					
Agency or Company		Rick Engineering Company		Junction		Adams Street					
Date Performed		4/1/2016		Jurisdiction		Caltrans					
Analysis Time Period		PM Peak Hour		Analysis Year		Ex+Ambient+Cum+Proj(Year 2025)					
Project Description California Baptist University											
Inputs											
Upstream Adj Ramp ☒ Yes ☒ On ☐ No ☐ Off $L_{up} =$ 2400 ft $V_u =$ 981 veh/h		Freeway Number of Lanes, N		4		Downstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{down} =$ ft $V_D =$ veh/h		Ramp Number of Lanes, N		2	
		Acceleration Lane Length, L_A						Deceleration Lane Length L_D		0	
		Freeway Volume, V_F		6062				Ramp Volume, V_R		744	
		Freeway Free-Flow Speed, S_{FF}		65.0				Ramp Free-Flow Speed, S_{FR}		35.0	
Conversion to pc/h Under Base Conditions											
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$			
Freeway	6062	0.90	Level	2	1	0.988	1.00	6816			
Ramp	744	0.90	Level	2	1	0.988	1.00	837			
UpStream	981	0.90	Level	2	1	0.988	1.00	1103			
DownStream											
Merge Areas					Diverge Areas						
Estimation of v_{12}					Estimation of v_{12}						
$V_{12} = V_F (P_{FM})$ $L_{EQ} =$ (Equation 13-6 or 13-7) $P_{FM} =$ using Equation (Exhibit 13-6) $V_{12} =$ pc/h V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☐ Yes ☐ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ $L_{EQ} =$ (Equation 13-12 or 13-13) $P_{FD} =$ 0.260 using Equation (Exhibit 13-7) $V_{12} =$ 2392 pc/h V_3 or V_{av34} 2212 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☒ Yes ☐ No If Yes, $V_{12a} =$ 2726 pc/h (Equation 13-16, 13-18, or 13-19)						
Capacity Checks					Capacity Checks						
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?		
V_{FO}		Exhibit 13-8			V_F	6816	Exhibit 13-8	9400	No		
			$V_{FO} = V_F - V_R$	5979	Exhibit 13-8	9400	No				
			V_R	837	Exhibit 13-10	4000	No				
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area						
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?		
V_{R12}		Exhibit 13-8			V_{12}	2392	Exhibit 13-8	4400:All	No		
Level of Service Determination (if not F)					Level of Service Determination (if not F)						
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ 14.2 (pc/mi/ln) LOS = B (Exhibit 13-2)						
Speed Determination					Speed Determination						
$M_S =$ (Exhibit 13-11) $S_R =$ mph (Exhibit 13-11) $S_0 =$ mph (Exhibit 13-11) $S =$ mph (Exhibit 13-13)					$D_S =$ 0.503 (Exhibit 13-12) $S_R =$ 53.4 mph (Exhibit 13-12) $S_0 =$ 67.2 mph (Exhibit 13-12) $S =$ 60.9 mph (Exhibit 13-13)						

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	REC		Freeway/Dir of Travel		SR 91 Westbound				
Agency or Company	Rick Engineering Company		Junction		Adams Street				
Date Performed	4/1/2016		Jurisdiction		Caltrans				
Analysis Time Period	PM Peak Hour		Analysis Year		Ex+Ambient+Cum+Proj(Year 2025)				
Project Description California Baptist University									
Inputs									
Upstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off		Freeway Number of Lanes, N				4			
		Ramp Number of Lanes, N				1			
L _{up} = ft V _u = veh/h		Acceleration Lane Length, L _A				1500			
		Deceleration Lane Length L _D							
		Freeway Volume, V _F				6062			
		Ramp Volume, V _R				981			
		Freeway Free-Flow Speed, S _{FF}				65.0			
		Ramp Free-Flow Speed, S _{FR}				35.0			
		Downstream Adj Ramp ☒ Yes ☒ On ☐ No ☐ Off				L _{down} = 2400 ft V _D = 744 veh/h			
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	6062	0.90	Level	2	1	0.988	1.00	6816	
Ramp	981	0.90	Level	2	1	0.988	1.00	1103	
UpStream									
DownStream	744	0.90	Level	2	1	0.988	1.00	837	
Merge Areas					Diverge Areas				
Estimation of v₁₂					Estimation of v₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.080 using Equation (Exhibit 13-6) V ₁₂ = 545 pc/h V ₃ or V _{av34} = 3135 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? ☒ Yes ☐ No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 ☒ Yes ☐ No If Yes, V _{12a} = 2726 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = using Equation (Exhibit 13-7) V ₁₂ = pc/h V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? ☐ Yes ☐ No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 ☐ Yes ☐ No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}	7919	Exhibit 13-8		No	V _F		Exhibit 13-8		
					V _{FO} = V _F - V _R		Exhibit 13-8		
					V _R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}	3829	Exhibit 13-8	4600:All	No	V ₁₂		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 25.4 (pc/mi/ln) LOS = C (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = 0.395 (Exhibit 13-11) S _R = 55.9 mph (Exhibit 13-11) S ₀ = 59.4 mph (Exhibit 13-11) S = 57.7 mph (Exhibit 13-13)					D _S = (Exhibit 13-12) S _R = mph (Exhibit 13-12) S ₀ = mph (Exhibit 13-12) S = mph (Exhibit 13-13)				



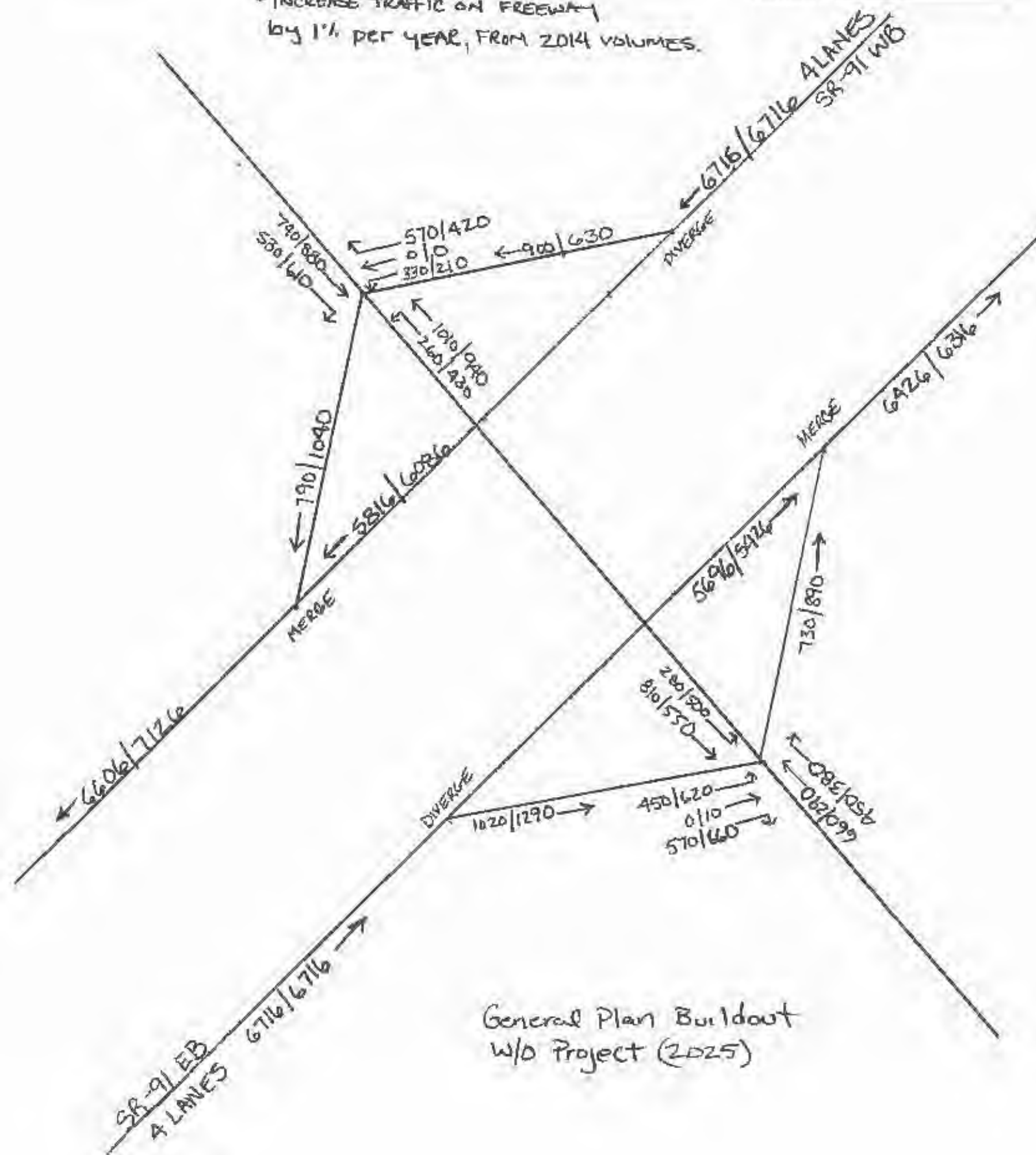
5620 Friars Road
San Diego, CA 92110-3596

Tel: (619) 291-0707

Fax: (619) 291-4165

Date 3/27/16
Job No. 15620-DG
Page _____
Done By JC
Checked By BRS

- INCREASE TRAFFIC ON FREEWAY
by 1% PER YEAR, FROM 2014 VOLUMES.



RAMPS AND RAMP JUNCTIONS WORKSHEET										
General Information					Site Information					
Analyst		REC		Freeway/Dir of Travel		SR 91 Eastbound				
Agency or Company		Rick Engineering Company		Junction		Adams Street				
Date Performed		8/25/2016		Jurisdiction		Caltrans				
Analysis Time Period		AM Peak Hour		Analysis Year		GenPlanBOWithoutProject(2025)				
Project Description California Baptist University										
Inputs										
Upstream Adj Ramp ☒ Yes ☒ On ☐ No ☐ Off L _{up} = 2400 ft V _u = 730 veh/h		Freeway Number of Lanes, N 4 Ramp Number of Lanes, N 2 Acceleration Lane Length, L _A Deceleration Lane Length L _D 0 Freeway Volume, V _F 5696 Ramp Volume, V _R 1020 Freeway Free-Flow Speed, S _{FF} 65.0 Ramp Free-Flow Speed, S _{FR} 35.0				Downstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off L _{down} = ft V _D = veh/h				
Conversion to pc/h Under Base Conditions										
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p		
Freeway	5696	0.90	Level	2	1	0.988	1.00	6405		
Ramp	1020	0.90	Level	2	1	0.988	1.00	1147		
UpStream	730	0.90	Level	2	1	0.988	1.00	821		
DownStream										
Merge Areas					Diverge Areas					
Estimation of v₁₂					Estimation of v₁₂					
V ₁₂ = V _F (P _{FM}) L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? ☐ Yes ☐ No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 ☐ Yes ☐ No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					V ₁₂ = V _R + (V _F - V _R)P _{FD} L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.260 using Equation (Exhibit 13-7) V ₁₂ = 2514 pc/h V ₃ or V _{av34} 1945 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? ☐ Yes ☒ No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 ☒ Yes ☐ No If Yes, V _{12a} = 2562 pc/h (Equation 13-16, 13-18, or 13-19)					
Capacity Checks					Capacity Checks					
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?	
V _{FO}		Exhibit 13-8				V _F	6405	Exhibit 13-8	9400	No
					V _{FO} = V _F - V _R	5258	Exhibit 13-8	9400	No	
					V _R	1147	Exhibit 13-10	4000	No	
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area					
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?	
	V _{R12}	Exhibit 13-8				V ₁₂	2514	Exhibit 13-8	4400:All No	
Level of Service Determination (if not F)					Level of Service Determination (if not F)					
D _R = 5.475 + 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					D _R = 4.252 + 0.0086 V ₁₂ - 0.009 L _D D _R = 12.8 (pc/mi/ln) LOS = B (Exhibit 13-2)					
Speed Determination					Speed Determination					
M _S = (Exhibit 13-11) S _R = mph (Exhibit 13-11) S ₀ = mph (Exhibit 13-11) S = mph (Exhibit 13-13)					D _S = 0.531 (Exhibit 13-12) S _R = 52.8 mph (Exhibit 13-12) S ₀ = 67.7 mph (Exhibit 13-12) S = 60.8 mph (Exhibit 13-13)					

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		REC		Freeway/Dir of Travel		SR 91 Eastbound			
Agency or Company		Rick Engineering Company		Junction		Adams Street			
Date Performed		8/25/2016		Jurisdiction		Caltrans			
Analysis Time Period		AM Peak Hour		Analysis Year		GenPlanBOWithoutProject(2025)			
Project Description California Baptist University									
Inputs									
Upstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{up} =$ ft $V_u =$ veh/h		Freeway Number of Lanes, N 4				Downstream Adj Ramp ☒ Yes ☒ On ☐ No ☐ Off $L_{down} =$ 2400 ft $V_D =$ 1020 veh/h			
		Ramp Number of Lanes, N 1							
		Acceleration Lane Length, L_A 1500							
		Deceleration Lane Length L_D							
		Freeway Volume, V_F 5696							
		Ramp Volume, V_R 730							
Freeway Free-Flow Speed, S_{FF} 65.0									
Ramp Free-Flow Speed, S_{FR} 35.0									
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	5696	0.90	Level	2	1	0.988	1.00	6405	
Ramp	730	0.90	Level	2	1	0.988	1.00	821	
UpStream									
DownStream	1020	0.90	Level	2	1	0.988	1.00	1147	
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$ $L_{EQ} =$ (Equation 13-6 or 13-7) $P_{FM} =$ 0.115 using Equation (Exhibit 13-6) $V_{12} =$ 738 pc/h V_3 or V_{av34} 2833 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☒ Yes ☐ No Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☒ Yes ☐ No If Yes, $V_{12a} =$ 2562 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ $L_{EQ} =$ (Equation 13-12 or 13-13) $P_{FD} =$ using Equation (Exhibit 13-7) $V_{12} =$ pc/h V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☐ Yes ☐ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}	7226	Exhibit 13-8		No	V_F		Exhibit 13-8		
					$V_{FO} = V_F - V_R$		Exhibit 13-8		
					V_R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V_{R12}	3383	Exhibit 13-8	4600:All	No	V_{12}		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ 22.1 (pc/mi/ln) LOS = C (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ 0.331 (Exhibit 13-11) $S_R =$ 57.4 mph (Exhibit 13-11) $S_0 =$ 59.9 mph (Exhibit 13-11) $S =$ 58.7 mph (Exhibit 13-13)					$D_s =$ (Exhibit 13-12) $S_R =$ mph (Exhibit 13-12) $S_0 =$ mph (Exhibit 13-12) $S =$ mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET										
General Information					Site Information					
Analyst		REC		Freeway/Dir of Travel		SR 91 Eastbound				
Agency or Company		Rick Engineering Company		Junction		Adams Street				
Date Performed		8/25/2016		Jurisdiction		Caltrans				
Analysis Time Period		PM Peak Hour		Analysis Year		GenPlanBOWithoutProject(2025)				
Project Description California Baptist University										
Inputs										
Upstream Adj Ramp ☒ Yes ☒ On ☐ No ☐ Off L _{up} = 2400 ft V _u = 890 veh/h		Freeway Number of Lanes, N 4 Ramp Number of Lanes, N 2 Acceleration Lane Length, L _A Deceleration Lane Length L _D 0 Freeway Volume, V _F 5426 Ramp Volume, V _R 1290 Freeway Free-Flow Speed, S _{FF} 65.0 Ramp Free-Flow Speed, S _{FR} 35.0				Downstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off L _{down} = ft V _D = veh/h				
Conversion to pc/h Under Base Conditions										
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p		
Freeway	5426	0.90	Level	2	1	0.988	1.00	6101		
Ramp	1290	0.90	Level	2	1	0.988	1.00	1451		
UpStream	890	0.90	Level	2	1	0.988	1.00	1001		
DownStream										
Merge Areas					Diverge Areas					
Estimation of v₁₂					Estimation of v₁₂					
$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? ☐ Yes ☐ No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 ☐ Yes ☐ No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.260 using Equation (Exhibit 13-7) V ₁₂ = 2660 pc/h V ₃ or V _{av34} 1720 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? ☐ Yes ☒ No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 ☐ Yes ☒ No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					
Capacity Checks					Capacity Checks					
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?	
V _{FO}		Exhibit 13-8				V _F	6101	Exhibit 13-8	9400	No
					V _{FO} = V _F - V _R	4650	Exhibit 13-8	9400	No	
					V _R	1451	Exhibit 13-10	4000	No	
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area					
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?	
	V _{R12}		Exhibit 13-8			V ₁₂	2660	Exhibit 13-8	4400:All No	
Level of Service Determination (if not F)					Level of Service Determination (if not F)					
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = 13.6 (pc/mi/ln) LOS = B (Exhibit 13-2)					
Speed Determination					Speed Determination					
M _S = (Exhibit 13-11) S _R = mph (Exhibit 13-11) S ₀ = mph (Exhibit 13-11) S = mph (Exhibit 13-13)					D _S = 0.559 (Exhibit 13-12) S _R = 52.2 mph (Exhibit 13-12) S ₀ = 68.5 mph (Exhibit 13-12) S = 60.3 mph (Exhibit 13-13)					

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		REC		Freeway/Dir of Travel		SR 91 Eastbound			
Agency or Company		Rick Engineering Company		Junction		Adams Street			
Date Performed		8/25/2016		Jurisdiction		Caltrans			
Analysis Time Period		PM Peak Hour		Analysis Year		GenPlanBOWithoutProject(2025)			
Project Description California Baptist University									
Inputs									
Upstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{up} =$ ft $V_u =$ veh/h		Freeway Number of Lanes, N 4				Downstream Adj Ramp ☒ Yes ☒ On ☐ No ☐ Off $L_{down} =$ 2400 ft $V_D =$ 1290 veh/h			
		Ramp Number of Lanes, N 1							
		Acceleration Lane Length, L_A 1500							
		Deceleration Lane Length L_D							
		Freeway Volume, V_F 5426							
		Ramp Volume, V_R 890							
Freeway Free-Flow Speed, S_{FF} 65.0									
Ramp Free-Flow Speed, S_{FR} 35.0									
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	5426	0.90	Level	2	1	0.988	1.00	6101	
Ramp	890	0.90	Level	2	1	0.988	1.00	1001	
UpStream									
DownStream	1290	0.90	Level	2	1	0.988	1.00	1451	
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$ $L_{EQ} =$ (Equation 13-6 or 13-7) $P_{FM} =$ 0.093 using Equation (Exhibit 13-6) $V_{12} =$ 565 pc/h V_3 or V_{av34} 2768 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☒ Yes ☐ No Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☒ Yes ☐ No If Yes, $V_{12a} =$ 2440 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ $L_{EQ} =$ (Equation 13-12 or 13-13) $P_{FD} =$ using Equation (Exhibit 13-7) $V_{12} =$ pc/h V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☐ Yes ☐ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}	7102	Exhibit 13-8		No	V_F		Exhibit 13-8		
					$V_{FO} = V_F - V_R$		Exhibit 13-8		
					V_R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V_{R12}	3441	Exhibit 13-8	4600:All	No	V_{12}		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ 22.4 (pc/mi/ln) LOS = C (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ 0.338 (Exhibit 13-11) $S_R =$ 57.2 mph (Exhibit 13-11) $S_0 =$ 60.2 mph (Exhibit 13-11) $S =$ 58.7 mph (Exhibit 13-13)					$D_s =$ (Exhibit 13-12) $S_R =$ mph (Exhibit 13-12) $S_0 =$ mph (Exhibit 13-12) $S =$ mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		REC		Freeway/Dir of Travel		SR 91 Westbound			
Agency or Company		Rick Engineering Company		Junction		Adams Street			
Date Performed		8/25/2016		Jurisdiction		Caltrans			
Analysis Time Period		AM Peak Hour		Analysis Year		GenPlanBOWithoutProject(2025)			
Project Description California Baptist University									
Inputs									
Upstream Adj Ramp ☒ Yes ☒ On ☐ No ☐ Off L _{up} = 2400 ft V _u = 790 veh/h		Freeway Number of Lanes, N				4		Downstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off L _{down} = ft V _D = veh/h	
		Ramp Number of Lanes, N				2			
		Acceleration Lane Length, L _A							
		Deceleration Lane Length L _D				0			
		Freeway Volume, V _F				5816			
		Ramp Volume, V _R				900			
Freeway Free-Flow Speed, S _{FF}				65.0					
Ramp Free-Flow Speed, S _{FR}				35.0					
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	5816	0.90	Level	2	1	0.988	1.00	6540	
Ramp	900	0.90	Level	2	1	0.988	1.00	1012	
UpStream	790	0.90	Level	2	1	0.988	1.00	888	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v₁₂					Estimation of v₁₂				
V ₁₂ = V _F (P _{FM}) L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? ☐ Yes ☐ No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 ☐ Yes ☐ No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					V ₁₂ = V _R + (V _F - V _R)P _{FD} L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.260 using Equation (Exhibit 13-7) V ₁₂ = 2449 pc/h V ₃ or V _{av34} 2045 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? ☐ Yes ☒ No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 ☒ Yes ☐ No If Yes, V _{12a} = 2616 pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	6540	Exhibit 13-8	9400	No
				V _{FO} = V _F - V _R	5528	Exhibit 13-8	9400	No	
				V _R	1012	Exhibit 13-10	4000	No	
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}		Exhibit 13-8			V ₁₂	2449	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
D _R = 5.475 + 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					D _R = 4.252 + 0.0086 V ₁₂ - 0.009 L _D D _R = 13.2 (pc/mi/ln) LOS = B (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = (Exhibit 13-11) S _R = mph (Exhibit 13-11) S ₀ = mph (Exhibit 13-11) S = mph (Exhibit 13-13)					D _S = 0.519 (Exhibit 13-12) S _R = 53.1 mph (Exhibit 13-12) S ₀ = 67.6 mph (Exhibit 13-12) S = 60.9 mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		REC		Freeway/Dir of Travel		SR 91 Westbound			
Agency or Company		Rick Engineering Company		Junction		Adams Street			
Date Performed		8/25/2016		Jurisdiction		Caltrans			
Analysis Time Period		AM Peak Hour		Analysis Year		GenPlanBOWithoutProject(2025)			
Project Description California Baptist University									
Inputs									
Upstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{up} =$ ft $V_u =$ veh/h		Freeway Number of Lanes, N 4				Downstream Adj Ramp ☒ Yes ☒ On ☐ No ☐ Off $L_{down} =$ 2400 ft $V_D =$ 900 veh/h			
		Ramp Number of Lanes, N 1							
		Acceleration Lane Length, L_A 1500							
		Deceleration Lane Length L_D							
		Freeway Volume, V_F 5816							
		Ramp Volume, V_R 790							
Freeway Free-Flow Speed, S_{FF} 65.0				Ramp Free-Flow Speed, S_{FR} 35.0					
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	5816	0.90	Level	2	1	0.988	1.00	6540	
Ramp	790	0.90	Level	2	1	0.988	1.00	888	
UpStream									
DownStream	900	0.90	Level	2	1	0.988	1.00	1012	
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$ $L_{EQ} =$ (Equation 13-6 or 13-7) $P_{FM} =$ 0.107 using Equation (Exhibit 13-6) $V_{12} =$ 698 pc/h V_3 or V_{av34} 2921 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☒ Yes ☐ No Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☒ Yes ☐ No If Yes, $V_{12a} =$ 2616 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ $L_{EQ} =$ (Equation 13-12 or 13-13) $P_{FD} =$ using Equation (Exhibit 13-7) $V_{12} =$ pc/h V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☐ Yes ☐ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}	7428	Exhibit 13-8		No	V_F		Exhibit 13-8		
					$V_{FO} = V_F - V_R$		Exhibit 13-8		
					V_R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V_{R12}	3504	Exhibit 13-8	4600:All	No	V_{12}		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ 23.0 (pc/mi/ln) LOS = C (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ 0.346 (Exhibit 13-11) $S_R =$ 57.0 mph (Exhibit 13-11) $S_0 =$ 59.7 mph (Exhibit 13-11) $S =$ 58.4 mph (Exhibit 13-13)					$D_s =$ (Exhibit 13-12) $S_R =$ mph (Exhibit 13-12) $S_0 =$ mph (Exhibit 13-12) $S =$ mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET										
General Information					Site Information					
Analyst		REC		Freeway/Dir of Travel		SR 91 Westbound				
Agency or Company		Rick Engineering Company		Junction		Adams Street				
Date Performed		8/25/2016		Jurisdiction		Caltrans				
Analysis Time Period		PM Peak Hour		Analysis Year		GenPlanBOWithoutProject(2025)				
Project Description California Baptist University										
Inputs										
Upstream Adj Ramp ☒ Yes ☒ On ☐ No ☐ Off L _{up} = 2400 ft V _u = 1040 veh/h		Freeway Number of Lanes, N 4 Ramp Number of Lanes, N 2 Acceleration Lane Length, L _A Deceleration Lane Length L _D 0 Freeway Volume, V _F 6086 Ramp Volume, V _R 630 Freeway Free-Flow Speed, S _{FF} 65.0 Ramp Free-Flow Speed, S _{FR} 35.0				Downstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off L _{down} = ft V _D = veh/h				
Conversion to pc/h Under Base Conditions										
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p		
Freeway	6086	0.90	Level	2	1	0.988	1.00	6843		
Ramp	630	0.90	Level	2	1	0.988	1.00	708		
UpStream	1040	0.90	Level	2	1	0.988	1.00	1169		
DownStream										
Merge Areas					Diverge Areas					
Estimation of v₁₂					Estimation of v₁₂					
V ₁₂ = V _F (P _{FM}) L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? ☐ Yes ☐ No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 ☐ Yes ☐ No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					V ₁₂ = V _R + (V _F - V _R)P _{FD} L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.260 using Equation (Exhibit 13-7) V ₁₂ = 2303 pc/h V ₃ or V _{av34} 2270 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? ☐ Yes ☒ No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 ☒ Yes ☐ No If Yes, V _{12a} = 2737 pc/h (Equation 13-16, 13-18, or 13-19)					
Capacity Checks					Capacity Checks					
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?	
V _{FO}		Exhibit 13-8				V _F	6843	Exhibit 13-8	9400	No
					V _{FO} = V _F - V _R	6135	Exhibit 13-8	9400	No	
					V _R	708	Exhibit 13-10	4000	No	
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area					
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?	
	V _{R12}	Exhibit 13-8				V ₁₂	2303	Exhibit 13-8	4400:All No	
Level of Service Determination (if not F)					Level of Service Determination (if not F)					
D _R = 5.475 + 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					D _R = 4.252 + 0.0086 V ₁₂ - 0.009 L _D D _R = 14.3 (pc/mi/ln) LOS = B (Exhibit 13-2)					
Speed Determination					Speed Determination					
M _S = (Exhibit 13-11) S _R = mph (Exhibit 13-11) S ₀ = mph (Exhibit 13-11) S = mph (Exhibit 13-13)					D _S = 0.492 (Exhibit 13-12) S _R = 53.7 mph (Exhibit 13-12) S ₀ = 67.2 mph (Exhibit 13-12) S = 61.1 mph (Exhibit 13-13)					

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		REC		Freeway/Dir of Travel		SR 91 Westbound			
Agency or Company		Rick Engineering Company		Junction		Adams Street			
Date Performed		8/25/2016		Jurisdiction		Caltrans			
Analysis Time Period		PM Peak Hour		Analysis Year		GenPlanBOWithoutProject(2025)			
Project Description California Baptist University									
Inputs									
Upstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{up} =$ ft $V_u =$ veh/h		Freeway Number of Lanes, N 4				Downstream Adj Ramp ☒ Yes ☒ On ☐ No ☐ Off $L_{down} =$ 2400 ft $V_D =$ 630 veh/h			
		Ramp Number of Lanes, N 1							
		Acceleration Lane Length, L_A 1500							
		Deceleration Lane Length L_D							
		Freeway Volume, V_F 6086							
		Ramp Volume, V_R 1040							
Freeway Free-Flow Speed, S_{FF} 65.0									
Ramp Free-Flow Speed, S_{FR} 35.0									
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	6086	0.90	Level	2	1	0.988	1.00	6843	
Ramp	1040	0.90	Level	2	1	0.988	1.00	1169	
UpStream									
DownStream	630	0.90	Level	2	1	0.988	1.00	708	
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$ $L_{EQ} =$ (Equation 13-6 or 13-7) $P_{FM} =$ 0.072 using Equation (Exhibit 13-6) $V_{12} =$ 490 pc/h V_3 or V_{av34} 3176 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☒ Yes ☐ No Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☒ Yes ☐ No If Yes, $V_{12a} =$ 2737 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ $L_{EQ} =$ (Equation 13-12 or 13-13) $P_{FD} =$ using Equation (Exhibit 13-7) $V_{12} =$ pc/h V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☐ Yes ☐ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}	8012	Exhibit 13-8		No	V_F		Exhibit 13-8		
					$V_{FO} = V_F - V_R$		Exhibit 13-8		
					V_R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V_{R12}	3906	Exhibit 13-8	4600:All	No	V_{12}		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ 26.0 (pc/mi/ln) LOS = C (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ 0.410 (Exhibit 13-11) $S_R =$ 55.6 mph (Exhibit 13-11) $S_0 =$ 59.4 mph (Exhibit 13-11) $S =$ 57.5 mph (Exhibit 13-13)					$D_s =$ (Exhibit 13-12) $S_R =$ mph (Exhibit 13-12) $S_0 =$ mph (Exhibit 13-12) $S =$ mph (Exhibit 13-13)				



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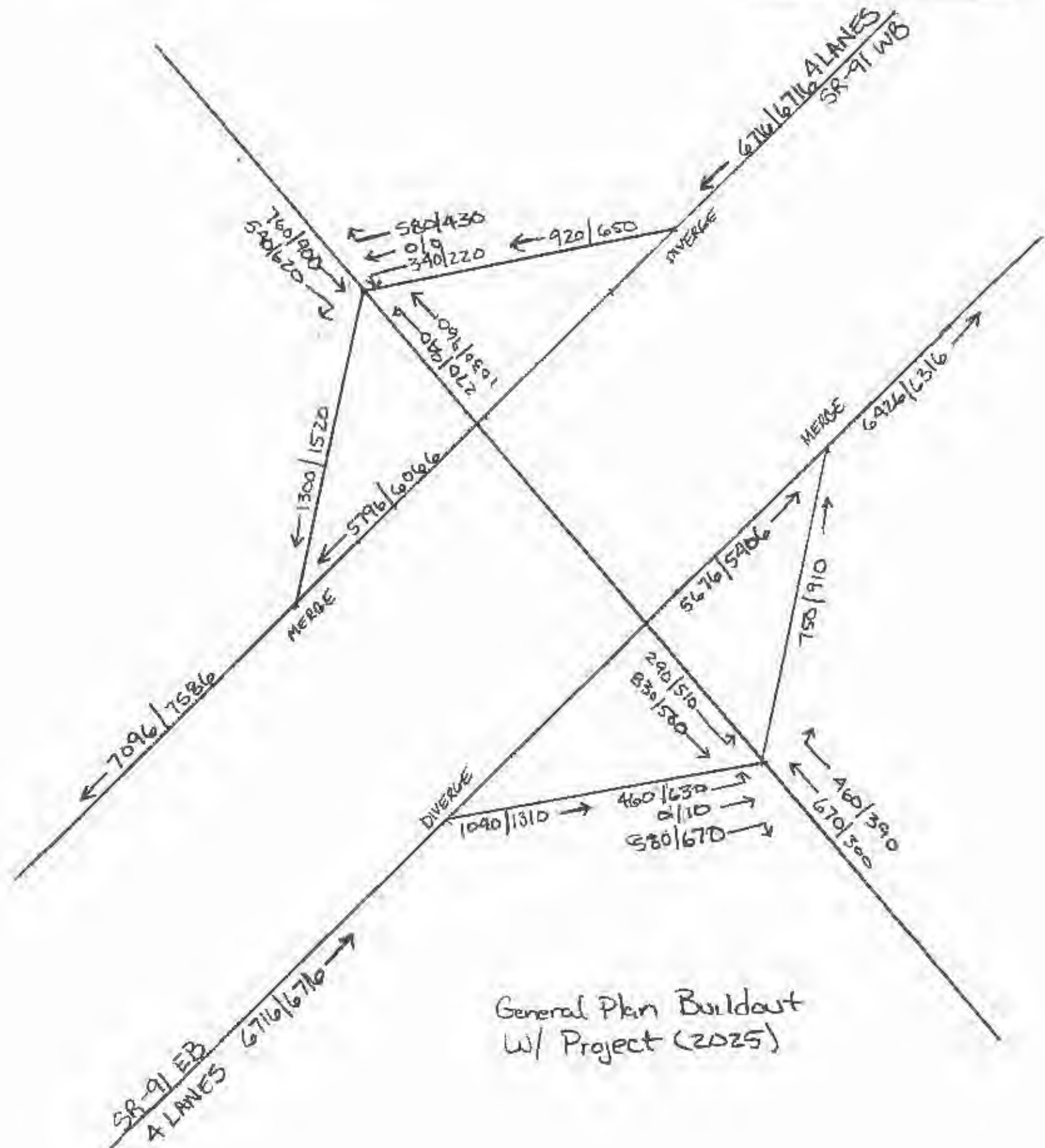
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RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		REC		Freeway/Dir of Travel		SR 91 Eastbound			
Agency or Company		Rick Engineering Company		Junction		Adams Street			
Date Performed		8/25/2016		Jurisdiction		Caltrans			
Analysis Time Period		AM Peak Hour		Analysis Year		GenPlanBOWithProject(2025)			
Project Description California Baptist University									
Inputs									
Upstream Adj Ramp ☒ Yes ☒ On ☐ No ☐ Off L _{up} = 2400 ft V _u = 750 veh/h		Freeway Number of Lanes, N				4		Downstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off L _{down} = ft V _D = veh/h	
		Ramp Number of Lanes, N				2			
		Acceleration Lane Length, L _A							
		Deceleration Lane Length L _D				0			
		Freeway Volume, V _F				5676			
		Ramp Volume, V _R				1040			
Freeway Free-Flow Speed, S _{FF}				65.0					
Ramp Free-Flow Speed, S _{FR}				35.0					
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	5676	0.90	Level	2	1	0.988	1.00	6382	
Ramp	1040	0.90	Level	2	1	0.988	1.00	1169	
UpStream	750	0.90	Level	2	1	0.988	1.00	843	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v₁₂					Estimation of v₁₂				
V ₁₂ = V _F (P _{FM}) L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? ☐ Yes ☐ No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 ☐ Yes ☐ No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					V ₁₂ = V _R + (V _F - V _R)P _{FD} L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.260 using Equation (Exhibit 13-7) V ₁₂ = 2524 pc/h V ₃ or V _{av34} 1929 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? ☐ Yes ☒ No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 ☒ Yes ☐ No If Yes, V _{12a} = 2552 pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	6382	Exhibit 13-8	9400	No
			V _{FO} = V _F - V _R	5213	Exhibit 13-8	9400	No		
			V _R	1169	Exhibit 13-10	4000	No		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}		Exhibit 13-8			V ₁₂	2524	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
D _R = 5.475 + 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					D _R = 4.252 + 0.0086 V ₁₂ - 0.009 L _D D _R = 12.7 (pc/mi/ln) LOS = B (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = (Exhibit 13-11) S _R = mph (Exhibit 13-11) S ₀ = mph (Exhibit 13-11) S = mph (Exhibit 13-13)					D _S = 0.533 (Exhibit 13-12) S _R = 52.7 mph (Exhibit 13-12) S ₀ = 67.7 mph (Exhibit 13-12) S = 60.8 mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		REC		Freeway/Dir of Travel		SR 91 Eastbound			
Agency or Company		Rick Engineering Company		Junction		Adams Street			
Date Performed		8/25/2016		Jurisdiction		Caltrans			
Analysis Time Period		AM Peak Hour		Analysis Year		GenPlanBOWithProject(2025)			
Project Description California Baptist University									
Inputs									
Upstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{up} =$ ft $V_u =$ veh/h		Freeway Number of Lanes, N 4				Downstream Adj Ramp ☒ Yes ☒ On ☐ No ☐ Off $L_{down} =$ 2400 ft $V_D =$ 1040 veh/h			
		Ramp Number of Lanes, N 1							
		Acceleration Lane Length, L_A 1500							
		Deceleration Lane Length L_D							
		Freeway Volume, V_F 5676							
		Ramp Volume, V_R 750							
Freeway Free-Flow Speed, S_{FF} 65.0				Ramp Free-Flow Speed, S_{FR} 35.0					
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	5676	0.90	Level	2	1	0.988	1.00	6382	
Ramp	750	0.90	Level	2	1	0.988	1.00	843	
UpStream									
DownStream	1040	0.90	Level	2	1	0.988	1.00	1169	
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$ $L_{EQ} =$ (Equation 13-6 or 13-7) $P_{FM} =$ 0.112 using Equation (Exhibit 13-6) $V_{12} =$ 717 pc/h V_3 or V_{av34} 2832 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☒ Yes ☐ No Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☒ Yes ☐ No If Yes, $V_{12a} =$ 2552 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ $L_{EQ} =$ (Equation 13-12 or 13-13) $P_{FD} =$ using Equation (Exhibit 13-7) $V_{12} =$ pc/h V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☐ Yes ☐ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}	7225	Exhibit 13-8		No	V_F		Exhibit 13-8		
					$V_{FO} = V_F - V_R$		Exhibit 13-8		
					V_R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V_{R12}	3395	Exhibit 13-8	4600:All	No	V_{12}		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ 22.2 (pc/mi/ln) LOS = C (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ 0.332 (Exhibit 13-11) $S_R =$ 57.4 mph (Exhibit 13-11) $S_0 =$ 59.9 mph (Exhibit 13-11) $S =$ 58.7 mph (Exhibit 13-13)					$D_s =$ (Exhibit 13-12) $S_R =$ mph (Exhibit 13-12) $S_0 =$ mph (Exhibit 13-12) $S =$ mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		REC		Freeway/Dir of Travel		SR 91 Eastbound			
Agency or Company		Rick Engineering Company		Junction		Adams Street			
Date Performed		8/25/2016		Jurisdiction		Caltrans			
Analysis Time Period		PM Peak Hour		Analysis Year		GenPlanBOWithProject(2025)			
Project Description California Baptist University									
Inputs									
Upstream Adj Ramp ☒ Yes ☒ On ☐ No ☐ Off $L_{up} =$ 2400 ft $V_u =$ 910 veh/h		Freeway Number of Lanes, N				4		Downstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{down} =$ ft $V_D =$ veh/h	
		Ramp Number of Lanes, N				2			
		Acceleration Lane Length, L_A							
		Deceleration Lane Length L_D				0			
		Freeway Volume, V_F				5406			
		Ramp Volume, V_R				1310			
Freeway Free-Flow Speed, S_{FF}				65.0					
Ramp Free-Flow Speed, S_{FR}				35.0					
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	5406	0.90	Level	2	1	0.988	1.00	6079	
Ramp	1310	0.90	Level	2	1	0.988	1.00	1473	
UpStream	910	0.90	Level	2	1	0.988	1.00	1023	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$ $L_{EQ} =$ (Equation 13-6 or 13-7) $P_{FM} =$ using Equation (Exhibit 13-6) $V_{12} =$ pc/h V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☐ Yes ☐ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ $L_{EQ} =$ (Equation 13-12 or 13-13) $P_{FD} =$ 0.260 using Equation (Exhibit 13-7) $V_{12} =$ 2671 pc/h V_3 or V_{av34} 1704 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☐ Yes ☒ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8			V_F	6079	Exhibit 13-8	9400	No
			$V_{FO} = V_F - V_R$	4606	Exhibit 13-8	9400	No		
			V_R	1473	Exhibit 13-10	4000	No		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8			V_{12}	2671	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ (pc/mi/ln) $LOS =$ (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ 13.7 (pc/mi/ln) $LOS =$ B (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ (Exhibit 13-11) $S_R =$ mph (Exhibit 13-11) $S_0 =$ mph (Exhibit 13-11) $S =$ mph (Exhibit 13-13)					$D_S =$ 0.561 (Exhibit 13-12) $S_R =$ 52.1 mph (Exhibit 13-12) $S_0 =$ 68.6 mph (Exhibit 13-12) $S =$ 60.2 mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		REC		Freeway/Dir of Travel		SR 91 Eastbound			
Agency or Company		Rick Engineering Company		Junction		Adams Street			
Date Performed		8/25/2016		Jurisdiction		Caltrans			
Analysis Time Period		PM Peak Hour		Analysis Year		GenPlanBOWithProject(2025)			
Project Description California Baptist University									
Inputs									
Upstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{up} =$ ft $V_u =$ veh/h		Freeway Number of Lanes, N 4				Downstream Adj Ramp ☒ Yes ☒ On ☐ No ☐ Off $L_{down} =$ 2400 ft $V_D =$ 1310 veh/h			
		Ramp Number of Lanes, N 1							
		Acceleration Lane Length, L_A 1500							
		Deceleration Lane Length L_D							
		Freeway Volume, V_F 5406							
		Ramp Volume, V_R 910							
Freeway Free-Flow Speed, S_{FF} 65.0									
Ramp Free-Flow Speed, S_{FR} 35.0									
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	5406	0.90	Level	2	1	0.988	1.00	6079	
Ramp	910	0.90	Level	2	1	0.988	1.00	1023	
UpStream									
DownStream	1310	0.90	Level	2	1	0.988	1.00	1473	
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$ $L_{EQ} =$ (Equation 13-6 or 13-7) $P_{FM} =$ 0.090 using Equation (Exhibit 13-6) $V_{12} =$ 547 pc/h V_3 or V_{av34} 2766 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☒ Yes ☐ No Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☒ Yes ☐ No If Yes, $V_{12a} =$ 2431 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ $L_{EQ} =$ (Equation 13-12 or 13-13) $P_{FD} =$ using Equation (Exhibit 13-7) $V_{12} =$ pc/h V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☐ Yes ☐ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}	7102	Exhibit 13-8		No	V_F		Exhibit 13-8		
					$V_{FO} = V_F - V_R$		Exhibit 13-8		
					V_R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V_{R12}	3454	Exhibit 13-8	4600:All	No	V_{12}		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ 22.5 (pc/mi/ln) LOS = C (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ 0.339 (Exhibit 13-11) $S_R =$ 57.2 mph (Exhibit 13-11) $S_0 =$ 60.2 mph (Exhibit 13-11) $S =$ 58.7 mph (Exhibit 13-13)					$D_s =$ (Exhibit 13-12) $S_R =$ mph (Exhibit 13-12) $S_0 =$ mph (Exhibit 13-12) $S =$ mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		REC		Freeway/Dir of Travel		SR 91 Westbound			
Agency or Company		Rick Engineering Company		Junction		Adams Street			
Date Performed		8/25/2016		Jurisdiction		Caltrans			
Analysis Time Period		AM Peak Hour		Analysis Year		GenPlanBOWithProject(2025)			
Project Description California Baptist University									
Inputs									
Upstream Adj Ramp ☒ Yes ☒ On ☐ No ☐ Off L _{up} = 2400 ft V _u = 1300 veh/h		Freeway Number of Lanes, N				4		Downstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off L _{down} = ft V _D = veh/h	
		Ramp Number of Lanes, N				2			
		Acceleration Lane Length, L _A							
		Deceleration Lane Length L _D				0			
		Freeway Volume, V _F				5796			
		Ramp Volume, V _R				920			
Freeway Free-Flow Speed, S _{FF}				65.0					
Ramp Free-Flow Speed, S _{FR}				35.0					
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF × f _{HV} × f _p	
Freeway	5796	0.90	Level	2	1	0.988	1.00	6517	
Ramp	920	0.90	Level	2	1	0.988	1.00	1034	
UpStream	1300	0.90	Level	2	1	0.988	1.00	1462	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v₁₂					Estimation of v₁₂				
V ₁₂ = V _F (P _{FM}) L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? ☐ Yes ☐ No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 ☐ Yes ☐ No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					V ₁₂ = V _R + (V _F - V _R)P _{FD} L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.260 using Equation (Exhibit 13-7) V ₁₂ = 2460 pc/h V ₃ or V _{av34} = 2028 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? ☐ Yes ☒ No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 ☒ Yes ☐ No If Yes, V _{12a} = 2606 pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	6517	Exhibit 13-8	9400	No
				V _{FO} = V _F - V _R	5483	Exhibit 13-8	9400	No	
				V _R	1034	Exhibit 13-10	4000	No	
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}		Exhibit 13-8			V ₁₂	2460	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
D _R = 5.475 + 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					D _R = 4.252 + 0.0086 V ₁₂ - 0.009 L _D D _R = 13.2 (pc/mi/ln) LOS = B (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = (Exhibit 13-11) S _R = mph (Exhibit 13-11) S ₀ = mph (Exhibit 13-11) S = mph (Exhibit 13-13)					D _S = 0.521 (Exhibit 13-12) S _R = 53.0 mph (Exhibit 13-12) S ₀ = 67.6 mph (Exhibit 13-12) S = 60.9 mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		REC		Freeway/Dir of Travel		SR 91 Westbound			
Agency or Company		Rick Engineering Company		Junction		Adams Street			
Date Performed		8/25/2016		Jurisdiction		Caltrans			
Analysis Time Period		AM Peak Hour		Analysis Year		GenPlanBOWithProject(2025)			
Project Description California Baptist University									
Inputs									
Upstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{up} =$ ft $V_u =$ veh/h		Freeway Number of Lanes, N 4				Downstream Adj Ramp ☒ Yes ☒ On ☐ No ☐ Off $L_{down} =$ 2400 ft $V_D =$ 920 veh/h			
		Ramp Number of Lanes, N 1							
		Acceleration Lane Length, L_A 1500							
		Deceleration Lane Length L_D							
		Freeway Volume, V_F 5796							
		Ramp Volume, V_R 1300							
Freeway Free-Flow Speed, S_{FF} 65.0									
Ramp Free-Flow Speed, S_{FR} 35.0									
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	5796	0.90	Level	2	1	0.988	1.00	6517	
Ramp	1300	0.90	Level	2	1	0.988	1.00	1462	
UpStream									
DownStream	920	0.90	Level	2	1	0.988	1.00	1034	
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$ $L_{EQ} =$ (Equation 13-6 or 13-7) $P_{FM} =$ 0.035 using Equation (Exhibit 13-6) $V_{12} =$ 228 pc/h V_3 or V_{av34} 3144 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☒ Yes ☐ No Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☒ Yes ☐ No If Yes, $V_{12a} =$ 2606 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ $L_{EQ} =$ (Equation 13-12 or 13-13) $P_{FD} =$ using Equation (Exhibit 13-7) $V_{12} =$ pc/h V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☐ Yes ☐ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}	7979	Exhibit 13-8		No	V_F		Exhibit 13-8		
					$V_{FO} = V_F - V_R$		Exhibit 13-8		
					V_R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V_{R12}	4068	Exhibit 13-8	4600:All	No	V_{12}		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ 27.1 (pc/mi/ln) LOS = C (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ 0.444 (Exhibit 13-11) $S_R =$ 54.8 mph (Exhibit 13-11) $S_0 =$ 59.8 mph (Exhibit 13-11) $S =$ 57.1 mph (Exhibit 13-13)					$D_s =$ (Exhibit 13-12) $S_R =$ mph (Exhibit 13-12) $S_0 =$ mph (Exhibit 13-12) $S =$ mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		REC		Freeway/Dir of Travel		SR 91 Westbound			
Agency or Company		Rick Engineering Company		Junction		Adams Street			
Date Performed		8/25/2016		Jurisdiction		Caltrans			
Analysis Time Period		PM Peak Hour		Analysis Year		GenPlanBOWithProject(2025)			
Project Description California Baptist University									
Inputs									
Upstream Adj Ramp ☒ Yes ☒ On ☐ No ☐ Off L _{up} = 2400 ft V _u = 1520 veh/h		Freeway Number of Lanes, N				4		Downstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off L _{down} = ft V _D = veh/h	
		Ramp Number of Lanes, N				2			
		Acceleration Lane Length, L _A							
		Deceleration Lane Length L _D				0			
		Freeway Volume, V _F				6066			
		Ramp Volume, V _R				650			
Freeway Free-Flow Speed, S _{FF}				65.0					
Ramp Free-Flow Speed, S _{FR}				35.0					
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	6066	0.90	Level	2	1	0.988	1.00	6821	
Ramp	650	0.90	Level	2	1	0.988	1.00	731	
UpStream	1520	0.90	Level	2	1	0.988	1.00	1709	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v₁₂					Estimation of v₁₂				
V ₁₂ = V _F (P _{FM}) L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? ☐ Yes ☐ No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 ☐ Yes ☐ No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					V ₁₂ = V _R + (V _F - V _R)P _{FD} L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.260 using Equation (Exhibit 13-7) V ₁₂ = 2314 pc/h V ₃ or V _{av34} = 2253 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? ☐ Yes ☒ No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 ☒ Yes ☐ No If Yes, V _{12a} = 2728 pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	6821	Exhibit 13-8	9400	No
				V _{FO} = V _F - V _R	6090	Exhibit 13-8	9400	No	
				V _R	731	Exhibit 13-10	4000	No	
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}		Exhibit 13-8			V ₁₂	2314	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
D _R = 5.475 + 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					D _R = 4.252 + 0.0086 V ₁₂ - 0.009 L _D D _R = 14.2 (pc/mi/ln) LOS = B (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = (Exhibit 13-11) S _R = mph (Exhibit 13-11) S ₀ = mph (Exhibit 13-11) S = mph (Exhibit 13-13)					D _S = 0.494 (Exhibit 13-12) S _R = 53.6 mph (Exhibit 13-12) S ₀ = 67.2 mph (Exhibit 13-12) S = 61.0 mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		REC		Freeway/Dir of Travel		SR 91 Westbound			
Agency or Company		Rick Engineering Company		Junction		Adams Street			
Date Performed		8/25/2016		Jurisdiction		Caltrans			
Analysis Time Period		PM Peak Hour		Analysis Year		GenPlanBOWithProject(2025)			
Project Description California Baptist University									
Inputs									
Upstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{up} =$ ft $V_u =$ veh/h		Freeway Number of Lanes, N 4				Downstream Adj Ramp ☒ Yes ☒ On ☐ No ☐ Off $L_{down} =$ 2400 ft $V_D =$ 650 veh/h			
		Ramp Number of Lanes, N 1							
		Acceleration Lane Length, L_A 1500							
		Deceleration Lane Length L_D							
		Freeway Volume, V_F 6066							
		Ramp Volume, V_R 1520							
Freeway Free-Flow Speed, S_{FF} 65.0									
Ramp Free-Flow Speed, S_{FR} 35.0									
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	6066	0.90	Level	2	1	0.988	1.00	6821	
Ramp	1520	0.90	Level	2	1	0.988	1.00	1709	
UpStream									
DownStream	650	0.90	Level	2	1	0.988	1.00	731	
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$ $L_{EQ} =$ (Equation 13-6 or 13-7) $P_{FM} =$ 0.004 using Equation (Exhibit 13-6) $V_{12} =$ 28 pc/h V_3 or V_{av34} 3396 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☒ Yes ☐ No Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☒ Yes ☐ No If Yes, $V_{12a} =$ 2728 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ $L_{EQ} =$ (Equation 13-12 or 13-13) $P_{FD} =$ using Equation (Exhibit 13-7) $V_{12} =$ pc/h V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☐ Yes ☐ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}	8530	Exhibit 13-8		No	V_F		Exhibit 13-8		
					$V_{FO} = V_F - V_R$		Exhibit 13-8		
					V_R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V_{R12}	4437	Exhibit 13-8	4600:All	No	V_{12}		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ 29.9 (pc/mi/ln) LOS = D (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ 0.546 (Exhibit 13-11) $S_R =$ 52.5 mph (Exhibit 13-11) $S_0 =$ 59.4 mph (Exhibit 13-11) $S =$ 55.6 mph (Exhibit 13-13)					$D_s =$ (Exhibit 13-12) $S_R =$ mph (Exhibit 13-12) $S_0 =$ mph (Exhibit 13-12) $S =$ mph (Exhibit 13-13)				

APPENDIX K

Existing + Project Analysis

EXISTING + PROJECT OPERATIONS

An analysis has been performed for the existing + project conditions, where the project traffic has been distributed to the existing road network. This scenario is theoretical, as ambient growth and other approved projects are, and will be, adding traffic to the study intersections and roadways. This scenario is intended to support the CEQA document.

Signalized Intersections

Table A shows that all project area signalized intersections are anticipated to operate at LOS C or better during both the AM and PM peak hour, with the exception of the following:

- Adams Street/Magnolia Avenue – LOS D during the AM and PM peak hours.
- Adams Street/SR 91 WB Ramps – LOS E during the AM peak hour.
- Adams Street/SR 91 EB Ramps –LOS D during the AM peak hour and LOS F during the PM peak hour.
- Magnolia Avenue/Jackson Street –LOS D during the PM peak hour.
- Magnolia Avenue/Monroe St –LOS D during the AM and PM peak hours.

The addition of an exclusive right turn lane (100 feet min.) to the EB direction of Magnolia Avenue at the Adams Street/Magnolia Avenue intersection is an improvement indicated within the report body for the existing + ambient + project scenario, which will improve the operation of this intersection.

It should be noted that the City of Riverside has begun the Project Study Report (PSR) process, with Caltrans, for the improvements to the Adams Street/SR-91 interchange. Seven (7) alternatives are currently being considered. However, for this report's analysis, the existing configuration was assumed, as a preferred alternative has not yet been chosen. Improvements to the interchange will likely result in acceptable levels of service.

Unsignalized Intersections

Table A shows that each of the turning movements is anticipated to operate at LOS C or better during both the AM and PM peak hour.

Roadway Segments

Table B shows that all project area roadway segments are anticipated to operate at LOS D or better, with the exception of the following:

- Adams Street, between Briarwood Drive and Diana Avenue operates at LOS E.
- Adams Street, between SR-91 Westbound and SR-91 Eastbound Ramps operates at LOS E

Operations along Adams Street, between Briarwood Drive and Diana Avenue are expected to operate at LOS D with the expected roadway widening going from a four-lane arterial to a five-lane arterial.

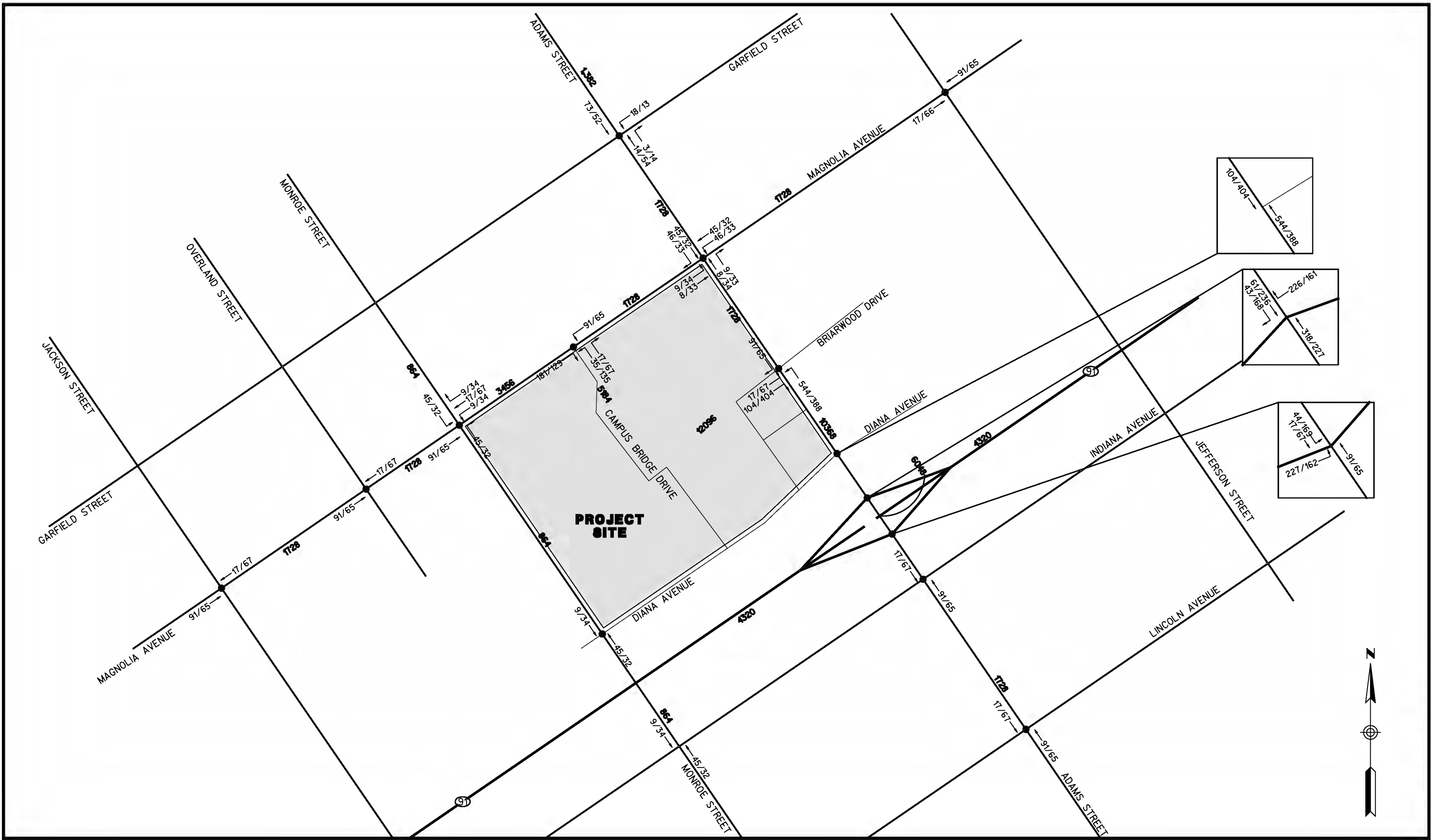
Queuing

Table C shows the existing + project queuing at each of the critical movements of the studied signalized intersections.

Ramp Merge/Diverge Analysis

Table D shows the existing + project merge/diverge analysis at each of the studied ramps.

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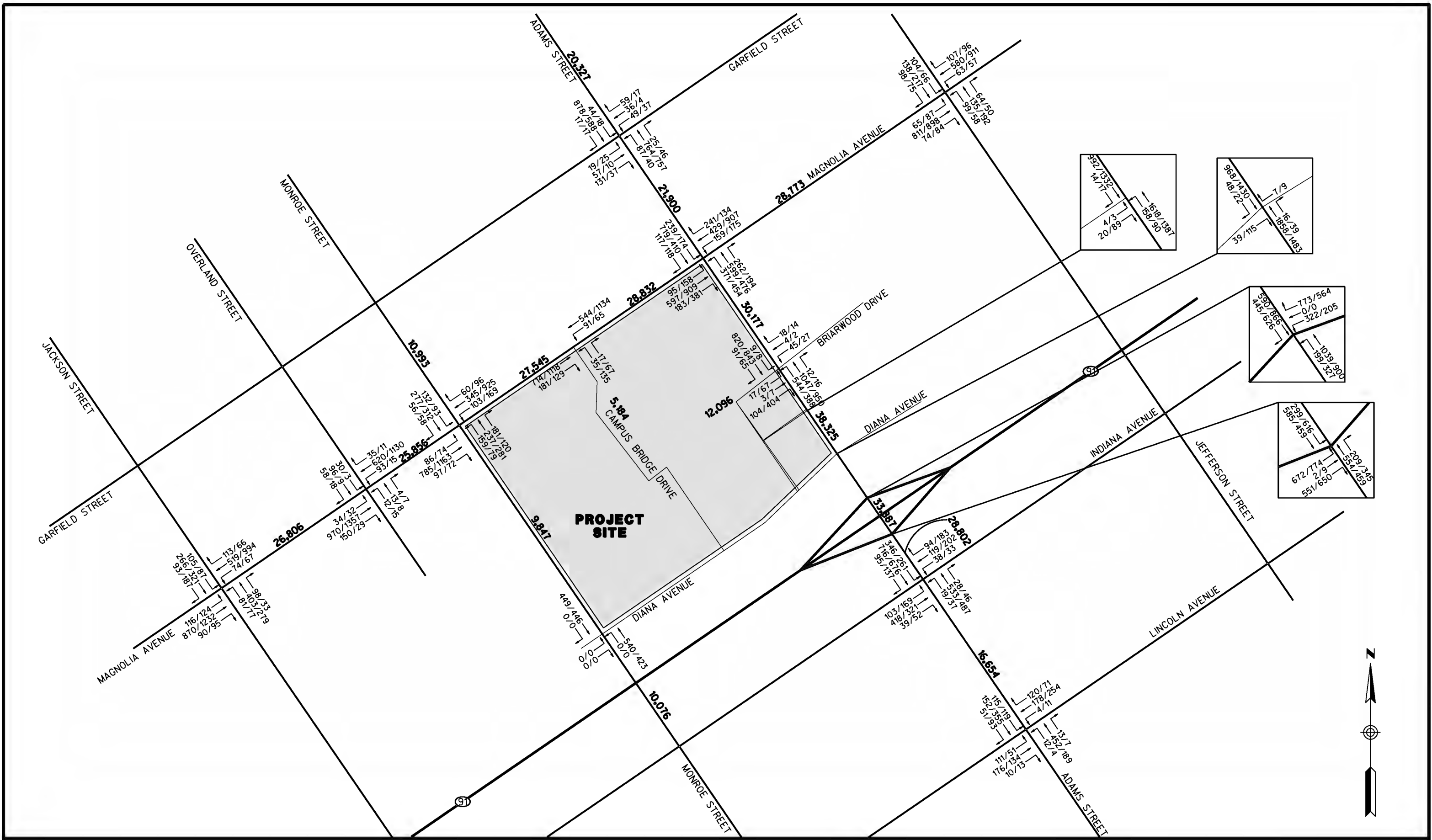
EXHIBIT A
PROJECT TRAFFIC ASSIGNMENT
CALIFORNIA BAPTIST UNIVERSITY TRAFFIC ANALYSIS

LEGEND
XX/XX = AM PEAK HOUR/PM PEAK HOUR
XXXX = ADT



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(FAX) 619.291.4165

EXHIBIT B
EXISTING + PROJECT TRAFFIC VOLUMES
CALIFORNIA BAPTIST UNIVERSITY TRAFFIC ANALYSIS

LEGEND
XX/XX = AM PEAK HOUR/PM PEAK HOUR
XXXX = ADT

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**TABLE A
EXISTING + PROJECT
INTERSECTION OPERATIONS**

Intersection	Existing				Existing + Project				Significant Impact
	AM		PM		AM		PM		
	Peak Hour		Peak Hour		Peak Hour		Peak Hour		
	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	
Adams Street & Garfield Street (Signalized)	12.5	B	7.0	A	13.2	B	7.2	A	No
Adams Street & Magnolia Avenue (Signalized)	40.5	D	43.7	D	47.8	D	52.2	D	No
Adams Street & Briarwood Drive (Signalized)	8.5	A	11.0	B	25.7	C	25.5	C	No
Adams Street & Plaza Driveway (Unsignalized)									
EB L/R	31.7	D	15.7	C	13.3	B	17.7	C	No
NB L	1.6	A	0.9	A	13.6	B	14.5	B	No
Adams Street & Diana Avenue (Unsignalized)									
EB R	14.8	B	17.1	C	15.9	C	24.3	C	No
WB R	16.1	C	13.1	B	23.7	C	16.0	C	No
Adams Street & SR 91 WB Ramps (Signalized)	36.9	D	25.5	C	56.8	E	34.5	C	Yes
Adams Street & SR 91 EB Ramps (Signalized)	31.8	C	73.1	E	37.5	D	112.7	F	Yes
Adams Street & Indiana Avenue (Signalized)	28.0	C	31.1	C	31.4	C	33.6	C	No
Adams Street & Lincoln Street (Signalized)	22.3	C	17.9	B	22.4	C	17.5	B	No
Magnolia Avenue & Jackson Street (Signalized)	28.5	C	40.4	D	32.0	C	47.4	D	No
Magnolia Avenue & Overland Street (Signalized)	5.7	A	2.7	A	5.9	A	2.7	A	No
Magnolia Avenue & Monroe Street (Signalized)	37.6	D	37.5	D	42.8	D	45.4	D	No
Magnolia Avenue & Campus View (Signalized)	10.8	B	16.8	B	5.9	A	7.7	A	No
Magnolia Street & Jefferson Avenue (Signalized)	27.2	C	27.6	C	27.9	C	29.7	C	No
Diana Avenue & Monroe Street (Unsignalized)									
EB L/T/R	0.0	A	0.0	A	0.0	A	0.0	A	No
WB L/T/R	18.6	C	25.8	D	-	-	-	-	No
NB L/T/R	0.0	A	0.0	A	-	-	-	-	No
SB L/T/R	1.3	A	0.9	A	-	-	-	-	No
Diana Avenue & Campus View (Unsignalized)									
EB L/T	2.8	A	1.6	A	-	-	-	-	No
SB L/R	10.0	B	10.3	B	-	-	-	-	No
Diana Avenue & Plaza Driveway (Unsignalized)									
EB L/T	2.9	A	3.1	A	-	-	-	-	No
SB L/R	9.4	A	9.0	A	-	-	-	-	No

*Significant Impact criteria per Exhibit F of City of Riverside Traffic Impact Analysis Preparation Guide, dated January 2016

TABLE B
EXISTING + PROJECT
ROADWAY SEGMENT OPERATIONS

Street Segment	Roadway Classification	LOS D Capacity	# of Lanes	Existing		Existing + Project	
				ADT	LOS	ADT	LOS
Monroe Street							
b/w Garfield St & Magnolia Ave	Collector	12,499	2	10,129	C	10,993	C
b/w Magnolia Ave and Diana Ave	Arterial	17,999	2	8,983	<C	9,847	<C
b/w Diana Ave and Indiana Ave	Arterial	17,999	2	9,212	<C	10,076	C
Magnolia Avenue							
b/w Jefferson St and Adams St	Special Boulevard*	32,999	4	27,045	C	28,773	C
b/w Adams St and Campus View	Special Boulevard*	32,999	4	27,104	C	28,832	C
b/w Campus View and Monroe St	Special Boulevard*	32,999	4	24,089	<C	27,545	C
b/w Monroe St and Overland St	Special Boulevard*	32,999	4	24,128	<C	25,856	<C
b/w Overland St and Jackson St	Special Boulevard*	32,999	4	25,078	<C	26,806	C
Adams Street							
b/w California Ave and Garfield St	Arterial	32,999	4	18,945	<C	20,327	<C
b/w Garfield St and Magnolia Ave	Arterial	32,999	4	20,172	<C	21,900	<C
b/w Magnolia Ave and Briarwood Dr	Arterial	32,999	4	28,449	C	30,177	D
b/w Briarwood Dr and Diana Ave	Arterial	32,999	4	27,957	C	38,325	E
b/w Briarwood Dr and Diana Ave w/Imp	Arterial	41,249	5	27,957	<C	38,325	D
b/w SR-91 WB and SR-91 EB Ramps	Arterial	32,999	4	27,939	C	33,887	E
b/w SR-91 EB Ramp and Indiana Ave	Arterial	32,999	4	27,074	C	28,802	C
b/w Indiana Ave and Lincoln Ave	Arterial	32,999	4	14,926	<C	16,654	<C
Diana Avenue							
b/w Adams St and Campus View	Collector	12,499	2	3,522	<C	-	-
b/w Campus View and Monroe St	Collector	12,499	2	2,689	<C	-	-

Note:

LOS D Capacity based on City of Riverside Roadway Capacity Exhibit D.

*Magnolia Avenue classified per City of Riverside Master Plan of Roadways and Magnolia Avenue Specific Plan.

TABLE C
EXISTING + PROJECT
QUEUING

Intersection Movement	Existing Storage Length (Feet)	95th Percentile Queue (Feet)			
		Existing		Existing + Project	
		AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
Adams Street & Garfield Street					
Northbound Left-Turn	50	65	30	65	30
Southbound Left-Turn	50	39	18	39	18
Magnolia Avenue & Adams Street					
Eastbound Left-Turn	180	#149	#168	#171	174
Westbound Left-Turn	135	#190	#215	#289	#270
Northbound Left-Turn	145	#224	#265	#224	#285
Northbound Right-Turn	245	80	52	89	55
Southbound Left-Turn	105	#326	#208	#326	#227
Adams Street & Briarwood Drive					
Northbound Left-Turn	250	m32	44	m262	m181
Southbound Left-Turn	48	20	17	26	23
Adams Street & SR 91 WB Ramps					
Westbound Left-Turn	-	391	260	#595	#431
Westbound Right-Turn	-	315	92	#608	267
Northbound Left-Turn	170	#210	m167	m#227	m170
Adams Street & SR 91 EB Ramps					
Eastbound Left-Turn	-	361	#635	#710	#994
Eastbound Right-Turn	-	346	#366	380	#499
Southbound Left-Turn	170	m245	#474	m307	m#777
Adams Street & Indiana Avenue					
Eastbound Left-Turn	130	130	#193	145	194
Westbound Left-Turn	95	64	42	70	60
Northbound Left-Turn	145	40	45	44	65
Southbound Left-Turn	75	#227	#263	252	m245
Adams Street & Lincoln Street					
Eastbound Left-Turn	120	#110	#60	#110	#60
Westbound Left-Turn	140	9	18	9	18
Northbound Left-Turn	150	18	10	18	10
Southbound Left-Turn	200	#114	#103	#114	#103
Magnolia Avenue & Jackson Street					
Eastbound Left-Turn	170	#120	#144	#120	#144
Westbound Left-Turn	110	#97	#90	#97	#90
Northbound Left-Turn	150	#97	#105	#97	#105
Southbound Left-Turn	125	#129	#118	#129	#118
Magnolia Avenue & Overland Street					
Eastbound Left-Turn	110	15	9	15	9
Westbound Left-Turn	110	59	5	#86	5
Magnolia Avenue & Monroe Street					
Eastbound Left-Turn	105	115	111	115	#130
Westbound Left-Turn	115	#141	#238	#141	#288
Northbound Left-Turn	150	#214	#159	#214	#147
Northbound Right-Turn	150	28	38	29	43
Southbound Left-Turn	150	117	#118	#172	#183
Magnolia Avenue & Campus View					
Westbound Left-Turn	160	#330	#299	102	80
Northbound Left-Turn	100	37	117	37	111
Northbound Right-Turn	100	33	51	15	29
Magnolia Street & Jefferson Avenue					
Eastbound Left-Turn	110	#72	#92	#72	#103
Westbound Left-Turn	110	#81	#73	#81	#73
Northbound Left-Turn	140	#119	#74	#119	#74
Southbound Left-Turn	140	#125	#85	#125	#85

Note:

95th percentile volume exceeds capacity, queue may be longer.
m Volume for 95th percentile queue is metered by upstream signal.
Queue shown is maximum after 2 two cycles.

**TABLE D
EXISTING + PROJECT
RAMP MERGE/DIVERGE ANALYSIS**

Ramp	Existing				Existing + Project			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS
SR 91 Westbound Offramp at Adams Street	11.3	B	12.3	B	13.0	B	12.2	B
SR 91 Westbound Onramp at Adams Street	19.6	B	9.2	A	21.5	C	23.4	C
SR 91 Eastbound Offramp at Adams Street	10.9	B	12.2	B	12.5	B	13.3	B
SR 91 Eastbound Onramp at Adams Street	36.5	E	39.4	E	37.6	E	41.2	E

HCM 2010 Signalized Intersection Summary

1: Adams Street & Garfield Street

08/17/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	19	57	131	49	36	59	87	764	25	44	879	17
Future Volume (veh/h)	19	57	131	49	36	59	87	764	25	44	879	17
Number	5	2	12	1	6	16	3	8	18	7	4	14
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	1900	1863	1900	1900	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	23	69	158	59	43	71	105	920	30	53	1059	20
Adj No. of Lanes	0	1	0	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	106	120	236	196	133	154	134	1609	52	77	1519	29
Arrive On Green	0.23	0.23	0.23	0.23	0.23	0.23	0.08	0.46	0.46	0.04	0.43	0.43
Sat Flow, veh/h	77	528	1039	387	586	678	1774	3498	114	1774	3553	67
Grp Volume(v), veh/h	250	0	0	173	0	0	105	465	485	53	527	552
Grp Sat Flow(s),veh/h/ln	1644	0	0	1651	0	0	1774	1770	1843	1774	1770	1851
Q Serve(g_s), s	1.2	0.0	0.0	0.0	0.0	0.0	2.6	8.6	8.6	1.3	10.8	10.8
Cycle Q Clear(g_c), s	6.1	0.0	0.0	3.8	0.0	0.0	2.6	8.6	8.6	1.3	10.8	10.8
Prop In Lane	0.09		0.63	0.34		0.41	1.00		0.06	1.00		0.04
Lane Grp Cap(c), veh/h	462	0	0	484	0	0	134	814	848	77	757	791
V/C Ratio(X)	0.54	0.00	0.00	0.36	0.00	0.00	0.78	0.57	0.57	0.69	0.70	0.70
Avail Cap(c_a), veh/h	819	0	0	805	0	0	279	874	910	239	834	872
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.6	0.0	0.0	14.8	0.0	0.0	20.2	8.8	8.8	21.0	10.4	10.4
Incr Delay (d2), s/veh	1.0	0.0	0.0	0.4	0.0	0.0	9.5	0.8	0.8	10.6	2.3	2.2
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	2.9	0.0	0.0	1.9	0.0	0.0	1.6	4.3	4.5	0.9	5.8	6.0
LnGrp Delay(d),s/veh	16.6	0.0	0.0	15.2	0.0	0.0	29.7	9.6	9.6	31.6	12.7	12.6
LnGrp LOS	B			B			C	A	A	C	B	B
Approach Vol, veh/h	250				173				1055			
Approach Delay, s/veh	16.6				15.2				11.6			
Approach LOS	B				B				B			
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2		3	4	6		7	8				
Phs Duration (G+Y+Rc), s	14.1		7.4	23.1	14.1		5.9	24.5				
Change Period (Y+Rc), s	4.0		4.0	4.0	4.0		4.0	4.0				
Max Green Setting (Gmax), s	20.0		7.0	21.0	20.0		6.0	22.0				
Max Q Clear Time (g_c+I1), s	8.1		4.6	12.8	5.8		3.3	10.6				
Green Ext Time (p_c), s	2.1		0.0	6.2	2.3		0.0	8.2				
Intersection Summary												
HCM 2010 Ctrl Delay	13.2											
HCM 2010 LOS	B											

HCM 2010 Signalized Intersection Summary

2: Adams Street & Magnolia Avenue

09/05/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	95	597	183	159	429	241	371	599	262	239	719	117
Future Volume (veh/h)	95	597	183	159	429	241	371	599	262	239	719	117
Number	5	2	12	1	6	16	3	8	18	7	4	14
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	1788	1900	1900	1900	1886	1900	1900	1863	1976	1863	1863	1976
Adj Flow Rate, veh/h	108	678	208	181	488	274	422	681	298	272	817	133
Adj No. of Lanes	1	2	0	1	2	0	2	2	1	1	2	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	2	0	0	0	0	0	0	2	0	2	2	2
Cap, veh/h	133	773	237	184	682	381	494	1047	497	303	994	162
Arrive On Green	0.08	0.28	0.28	0.10	0.31	0.31	0.14	0.30	0.30	0.17	0.33	0.33
Sat Flow, veh/h	1703	2723	835	1810	2219	1240	3510	3539	1680	1774	3049	496
Grp Volume(v), veh/h	108	449	437	181	394	368	422	681	298	272	474	476
Grp Sat Flow(s),veh/h/ln	1703	1805	1753	1810	1792	1668	1755	1770	1680	1774	1770	1775
Q Serve(g_s), s	6.8	25.7	25.7	10.8	21.1	21.2	12.7	18.1	16.4	16.2	26.7	26.7
Cycle Q Clear(g_c), s	6.8	25.7	25.7	10.8	21.1	21.2	12.7	18.1	16.4	16.2	26.7	26.7
Prop In Lane	1.00		0.48	1.00		0.74	1.00		1.00	1.00		0.28
Lane Grp Cap(c), veh/h	133	512	497	184	551	513	494	1047	497	303	577	579
V/C Ratio(X)	0.81	0.88	0.88	0.98	0.71	0.72	0.85	0.65	0.60	0.90	0.82	0.82
Avail Cap(c_a), veh/h	157	534	519	184	551	513	584	1145	543	344	622	624
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	49.1	36.9	36.9	48.5	33.2	33.3	45.4	33.2	32.6	43.9	33.6	33.6
Incr Delay (d2), s/veh	23.4	14.9	15.3	61.4	4.4	4.8	10.5	1.2	1.6	23.4	8.2	8.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.0	14.8	14.5	8.5	11.1	10.4	6.9	9.1	7.8	9.9	14.4	14.4
LnGrp Delay(d),s/veh	72.5	51.8	52.2	109.9	37.6	38.1	55.9	34.4	34.2	67.3	41.8	41.8
LnGrp LOS	E	D	D	F	D	D	E	C	C	E	D	D
Approach Vol, veh/h		994			943			1401			1222	
Approach Delay, s/veh		54.2			51.7			40.8			47.5	
Approach LOS		D			D			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	15.0	34.7	19.2	39.3	12.4	37.3	22.5	36.0				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	11.0	32.0	18.0	38.0	10.0	33.0	21.0	35.0				
Max Q Clear Time (g_c+I1), s	12.8	27.7	14.7	28.7	8.8	23.2	18.2	20.1				
Green Ext Time (p_c), s	0.0	3.0	0.5	6.6	0.0	6.4	0.2	9.3				
Intersection Summary												
HCM 2010 Ctrl Delay				47.8								
HCM 2010 LOS				D								

HCM 2010 Signalized Intersection Summary

3: Adams Street & Briarwood Drive

09/05/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	17	3	104	45	4	18	544	1047	12	9	820	91
Future Volume (veh/h)	17	3	104	45	4	18	544	1047	12	9	820	91
Number	5	2	12	1	6	16	3	8	18	7	4	14
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	1937	1863	1900	1937	1900	1863	1863	1976	1863	1863	1976
Adj Flow Rate, veh/h	20	4	125	54	5	22	655	1261	14	11	988	110
Adj No. of Lanes	1	1	1	0	1	0	2	2	0	1	2	0
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	204	196	160	137	19	40	763	2745	30	59	1854	206
Arrive On Green	0.10	0.10	0.10	0.10	0.10	0.10	0.15	0.51	0.51	0.03	0.58	0.58
Sat Flow, veh/h	1378	1937	1583	865	191	394	3442	3586	40	1774	3212	357
Grp Volume(v), veh/h	20	4	125	81	0	0	655	622	653	11	544	554
Grp Sat Flow(s),veh/h/ln	1378	1937	1583	1450	0	0	1721	1770	1856	1774	1770	1800
Q Serve(g_s), s	0.0	0.2	9.2	5.2	0.0	0.0	22.3	26.9	26.9	0.7	22.5	22.6
Cycle Q Clear(g_c), s	1.5	0.2	9.2	6.2	0.0	0.0	22.3	26.9	26.9	0.7	22.5	22.6
Prop In Lane	1.00		1.00	0.67		0.27	1.00		0.02	1.00		0.20
Lane Grp Cap(c), veh/h	204	196	160	197	0	0	763	1355	1421	59	1021	1039
V/C Ratio(X)	0.10	0.02	0.78	0.41	0.00	0.00	0.86	0.46	0.46	0.19	0.53	0.53
Avail Cap(c_a), veh/h	432	517	422	431	0	0	1319	1355	1421	118	1021	1039
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.37	0.37	0.37
Uniform Delay (d), s/veh	49.2	48.6	52.6	51.2	0.0	0.0	49.2	13.4	13.4	56.4	15.5	15.5
Incr Delay (d2), s/veh	0.2	0.0	8.0	1.4	0.0	0.0	2.9	1.1	1.1	0.6	0.7	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.1	4.4	2.6	0.0	0.0	10.9	13.5	14.2	0.4	11.1	11.3
LnGrp Delay(d),s/veh	49.4	48.6	60.6	52.5	0.0	0.0	52.2	14.5	14.5	57.0	16.2	16.2
LnGrp LOS	D	D	E	D			D	B	B	E	B	B
Approach Vol, veh/h		149			81			1930			1109	
Approach Delay, s/veh		58.8			52.5			27.3			16.6	
Approach LOS		E			D			C			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		16.1	30.6	73.3		16.1	8.0	95.9				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		32.0	46.0	30.0		32.0	8.0	68.0				
Max Q Clear Time (g_c+I1), s		11.2	24.3	24.6		8.2	2.7	28.9				
Green Ext Time (p_c), s		0.9	2.3	4.7		0.9	0.0	22.3				
Intersection Summary												
HCM 2010 Ctrl Delay			25.7									
HCM 2010 LOS			C									

HCM 2010 TWSC
4: Adams Street & Plaza Driveway

08/17/2018

Intersection						
Int Delay, s/veh	0.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗	↘	↗↘	↗↘	
Traffic Vol, veh/h	0	20	158	1618	992	14
Future Vol, veh/h	0	20	158	1618	992	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	97	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	23	182	1860	1140	16
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	-	578	1156	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	4.14	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	0	459	600	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	459	600	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	13.3	1.2		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	600	-	459	-	-	
HCM Lane V/C Ratio	0.303	-	0.05	-	-	
HCM Control Delay (s)	13.6	-	13.3	-	-	
HCM Lane LOS	B	-	B	-	-	
HCM 95th %tile Q(veh)	1.3	-	0.2	-	-	

Intersection												
Int Delay, s/veh	0.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗			↗		↕			↕	
Traffic Vol, veh/h	0	0	39	0	0	7	0	1858	16	0	968	48
Future Vol, veh/h	0	0	39	0	0	7	0	1858	16	0	968	48
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	47	0	0	8	0	2239	19	0	1166	58
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	-	-	612	-	-	1129	-	0	0	-	-	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	7.1	-	-	6.9	-	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.9	-	-	3.3	-	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	378	0	0	201	0	-	-	0	-	-
Stage 1	0	0	-	0	0	-	0	-	-	0	-	-
Stage 2	0	0	-	0	0	-	0	-	-	0	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	378	-	-	201	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	15.9		23.7		0		0					
HCM LOS	C		C									
Minor Lane/Major Mvmt	NBT		NBR		EBLn1WBLn1		SBT		SBR			
Capacity (veh/h)	-		-		378 201		-		-			
HCM Lane V/C Ratio	-		-		0.124 0.042		-		-			
HCM Control Delay (s)	-		-		15.9 23.7		-		-			
HCM Lane LOS	-		-		C C		-		-			
HCM 95th %tile Q(veh)	-		-		0.4 0.1		-		-			

HCM 2010 Signalized Intersection Summary

6: Adams Street & SR 91 WB Ramps

08/17/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	322	0	773	199	1039	0	0	590	445
Future Volume (veh/h)	0	0	0	322	0	773	199	1039	0	0	590	445
Number				1	6	16	3	8	18	7	4	14
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				1900	1863	1863	1863	1863	0	0	1863	1900
Adj Flow Rate, veh/h				388	407	660	240	1252	0	0	711	536
Adj No. of Lanes				0	1	1	1	2	0	0	3	0
Peak Hour Factor				0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %				2	2	2	2	2	0	0	2	2
Cap, veh/h				398	418	711	268	1715	0	0	1018	475
Arrive On Green				0.45	0.45	0.45	0.15	0.48	0.00	0.00	0.10	0.10
Sat Flow, veh/h				887	931	1583	1774	3632	0	0	3558	1583
Grp Volume(v), veh/h				795	0	660	240	1252	0	0	711	536
Grp Sat Flow(s),veh/h/ln				1818	0	1583	1774	1770	0	0	1695	1583
Q Serve(g_s), s				51.4	0.0	47.3	15.9	33.9	0.0	0.0	24.4	36.0
Cycle Q Clear(g_c), s				51.4	0.0	47.3	15.9	33.9	0.0	0.0	24.4	36.0
Prop In Lane				0.49		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				816	0	711	268	1715	0	0	1018	475
V/C Ratio(X)				0.97	0.00	0.93	0.90	0.73	0.00	0.00	0.70	1.13
Avail Cap(c_a), veh/h				818	0	712	310	1715	0	0	1018	475
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33
Upstream Filter(I)				1.00	0.00	1.00	0.67	0.67	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				32.4	0.0	31.3	50.0	24.7	0.0	0.0	48.8	54.1
Incr Delay (d2), s/veh				25.1	0.0	18.5	18.1	1.9	0.0	0.0	4.0	81.2
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				31.3	0.0	24.2	9.1	17.0	0.0	0.0	12.0	26.5
LnGrp Delay(d),s/veh				57.5	0.0	49.8	68.1	26.6	0.0	0.0	52.8	135.2
LnGrp LOS				E		D	E	C			D	F
Approach Vol, veh/h					1455			1492			1247	
Approach Delay, s/veh					54.0			33.2			88.2	
Approach LOS					D			C			F	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			22.1	40.0		57.9		62.1				
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0				
Max Green Setting (Gmax), s			21.0	33.0		54.0		58.0				
Max Q Clear Time (g_c+I1), s			17.9	38.0		53.4		35.9				
Green Ext Time (p_c), s			0.2	0.0		0.5		16.9				
Intersection Summary												
HCM 2010 Ctrl Delay				56.8								
HCM 2010 LOS				E								
Notes												
User approved volume balancing among the lanes for turning movement.												

HCM 2010 Signalized Intersection Summary

7: Adams Street & SR 91 EB Ramps

08/17/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations								  			 	
Traffic Volume (veh/h)	672	2	551	0	0	0	0	554	209	299	585	0
Future Volume (veh/h)	672	2	551	0	0	0	0	554	209	299	585	0
Number	5	2	12				3	8	18	7	4	14
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	1900	1863	1863				0	1863	1900	1863	1863	0
Adj Flow Rate, veh/h	715	2	586				0	589	222	318	622	0
Adj No. of Lanes	0	1	1				0	3	0	1	2	0
Peak Hour Factor	0.94	0.94	0.94				0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	774	2	693				0	990	364	341	1754	0
Arrive On Green	0.44	0.44	0.44				0.00	0.09	0.09	0.38	0.99	0.00
Sat Flow, veh/h	1769	5	1583				0	3833	1349	1774	3632	0
Grp Volume(v), veh/h	717	0	586				0	544	267	318	622	0
Grp Sat Flow(s),veh/h/ln	1774	0	1583				0	1695	1625	1774	1770	0
Q Serve(g_s), s	45.8	0.0	39.7				0.0	18.5	19.0	20.6	0.3	0.0
Cycle Q Clear(g_c), s	45.8	0.0	39.7				0.0	18.5	19.0	20.6	0.3	0.0
Prop In Lane	1.00		1.00				0.00		0.83	1.00		0.00
Lane Grp Cap(c), veh/h	776	0	693				0	915	439	341	1754	0
V/C Ratio(X)	0.92	0.00	0.85				0.00	0.59	0.61	0.93	0.35	0.00
Avail Cap(c_a), veh/h	843	0	752				0	915	439	414	1754	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	0.33	0.33	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.87	0.87	0.47	0.47	0.00
Uniform Delay (d), s/veh	31.8	0.0	30.1				0.0	48.3	48.6	36.2	0.3	0.0
Incr Delay (d2), s/veh	14.9	0.0	8.3				0.0	2.5	5.4	14.5	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	25.5	0.0	18.9				0.0	9.0	9.2	11.4	0.2	0.0
LnGrp Delay(d),s/veh	46.8	0.0	38.4				0.0	50.8	54.0	50.7	0.5	0.0
LnGrp LOS	D		D				D	D	D	D	A	
Approach Vol, veh/h	1303						811			940		
Approach Delay, s/veh	43.0						51.8			17.5		
Approach LOS	D						D			B		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2		4				7	8				
Phs Duration (G+Y+Rc), s	56.5		63.5				27.1	36.4				
Change Period (Y+Rc), s	4.0		4.0				4.0	4.0				
Max Green Setting (Gmax), s	57.0		55.0				28.0	23.0				
Max Q Clear Time (g_c+l1), s	47.8		2.3				22.6	21.0				
Green Ext Time (p_c), s	4.8		12.1				0.5	1.5				
Intersection Summary												
HCM 2010 Ctrl Delay			37.5									
HCM 2010 LOS			D									

HCM 2010 Signalized Intersection Summary

8: Adams Street & Indiana Avenue

08/17/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	103	418	39	38	119	94	19	533	28	346	716	95
Future Volume (veh/h)	103	418	39	38	119	94	19	533	28	346	716	95
Number	5	2	12	1	6	16	3	8	18	7	4	14
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	113	459	43	42	131	103	21	586	31	380	787	104
Adj No. of Lanes	1	2	0	1	2	0	1	2	0	1	2	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	139	565	53	54	243	178	30	1489	79	405	2033	269
Arrive On Green	0.08	0.17	0.17	0.03	0.12	0.12	0.02	0.44	0.44	0.46	1.00	1.00
Sat Flow, veh/h	1774	3273	305	1774	1953	1427	1774	3420	181	1774	3144	415
Grp Volume(v), veh/h	113	247	255	42	118	116	21	303	314	380	443	448
Grp Sat Flow(s),veh/h/ln	1774	1770	1809	1774	1770	1611	1774	1770	1831	1774	1770	1789
Q Serve(g_s), s	7.5	16.1	16.3	2.8	7.5	8.2	1.4	14.0	14.0	24.4	0.0	0.0
Cycle Q Clear(g_c), s	7.5	16.1	16.3	2.8	7.5	8.2	1.4	14.0	14.0	24.4	0.0	0.0
Prop In Lane	1.00		0.17	1.00		0.89	1.00		0.10	1.00		0.23
Lane Grp Cap(c), veh/h	139	306	312	54	221	201	30	770	797	405	1145	1157
V/C Ratio(X)	0.81	0.81	0.81	0.78	0.53	0.58	0.71	0.39	0.39	0.94	0.39	0.39
Avail Cap(c_a), veh/h	222	369	377	103	251	228	74	770	797	591	1145	1157
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.81	0.81	0.81	0.83	0.83	0.83
Uniform Delay (d), s/veh	54.4	47.7	47.8	57.8	49.3	49.5	58.7	23.1	23.1	31.8	0.0	0.0
Incr Delay (d2), s/veh	11.4	10.8	11.0	21.2	2.0	2.8	21.8	1.2	1.2	15.7	0.8	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	8.8	9.1	1.7	3.8	3.8	0.9	7.1	7.3	13.6	0.3	0.3
LnGrp Delay(d),s/veh	65.8	58.5	58.8	78.9	51.3	52.4	80.5	24.3	24.3	47.6	0.8	0.8
LnGrp LOS	E	E	E	E	D	D	F	C	C	D	A	A
Approach Vol, veh/h	615			276			638			1271		
Approach Delay, s/veh	60.0			55.9			26.1			14.8		
Approach LOS	E			E			C			B		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.6	24.7	6.0	81.6	13.4	19.0	31.4	56.2				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	7.6	25.0	5.0	67.0	15.0	17.0	40.0	32.0				
Max Q Clear Time (g_c+I), s	14.8	18.3	3.4	2.0	9.5	10.2	26.4	16.0				
Green Ext Time (p_c), s	0.0	2.5	0.0	11.9	0.1	2.5	0.9	7.8				
Intersection Summary												
HCM 2010 Ctrl Delay	31.4											
HCM 2010 LOS	C											

HCM 2010 Signalized Intersection Summary

9: Adams Street & Lincoln Avenue

08/17/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	111	176	10	4	178	120	12	452	13	115	152	51
Future Volume (veh/h)	111	176	10	4	178	120	12	452	13	115	152	51
Number	5	2	12	1	6	16	3	8	18	7	4	14
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	141	223	13	5	225	152	15	572	16	146	192	65
Adj No. of Lanes	1	2	0	1	2	0	1	2	0	1	2	0
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	179	970	56	9	391	253	26	1127	32	185	1074	353
Arrive On Green	0.10	0.29	0.29	0.01	0.19	0.19	0.01	0.32	0.32	0.10	0.41	0.41
Sat Flow, veh/h	1774	3400	197	1774	2061	1336	1774	3517	98	1774	2620	861
Grp Volume(v), veh/h	141	115	121	5	192	185	15	288	300	146	128	129
Grp Sat Flow(s),veh/h/ln	1774	1770	1828	1774	1770	1627	1774	1770	1845	1774	1770	1711
Q Serve(g_s), s	4.4	2.8	2.8	0.2	5.5	5.8	0.5	7.4	7.4	4.5	2.6	2.7
Cycle Q Clear(g_c), s	4.4	2.8	2.8	0.2	5.5	5.8	0.5	7.4	7.4	4.5	2.6	2.7
Prop In Lane	1.00		0.11	1.00		0.82	1.00		0.05	1.00		0.50
Lane Grp Cap(c), veh/h	179	505	521	9	336	309	26	567	592	185	725	701
V/C Ratio(X)	0.79	0.23	0.23	0.53	0.57	0.60	0.57	0.51	0.51	0.79	0.18	0.18
Avail Cap(c_a), veh/h	190	662	684	126	599	550	126	567	592	190	725	701
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	24.7	15.4	15.4	27.9	20.7	20.8	27.5	15.5	15.5	24.6	10.5	10.6
Incr Delay (d2), s/veh	18.8	0.2	0.2	38.7	1.5	1.9	17.8	3.2	3.1	19.5	0.5	0.6
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	8.0	1.4	1.4	0.2	2.8	2.8	0.4	4.1	4.3	3.2	1.3	1.4
LnGrp Delay(d),s/veh	43.5	15.6	15.6	66.6	22.2	22.7	45.3	18.7	18.6	44.1	11.1	11.2
LnGrp LOS	D	B	B	E	C	C	D	B	B	D	B	B
Approach Vol, veh/h	377				382		603				403	
Approach Delay, s/veh	26.0				23.0		19.3				23.1	
Approach LOS	C				C		B				C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	4.3	20.0	4.8	27.0	9.7	14.7	9.8	22.0				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	1.0	21.0	4.0	20.0	6.0	19.0	6.0	18.0				
Max Q Clear Time (g_c+I2), s	12.3	4.8	2.5	4.7	6.4	7.8	6.5	9.4				
Green Ext Time (p_c), s	0.0	3.4	0.0	4.1	0.0	2.8	0.0	3.0				
Intersection Summary												
HCM 2010 Ctrl Delay			22.4									
HCM 2010 LOS			C									

HCM 2010 Signalized Intersection Summary

10: Jackson Street & Magnolia Avenue

08/17/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	116	870	90	74	519	113	81	403	98	105	266	93
Future Volume (veh/h)	116	870	90	74	519	113	81	403	98	105	266	93
Number	5	2	12	1	6	16	3	8	18	7	4	14
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	140	1048	108	89	625	136	98	486	118	127	320	112
Adj No. of Lanes	1	2	0	1	2	0	1	2	0	1	2	0
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	177	1139	117	114	913	198	125	688	166	144	657	226
Arrive On Green	0.10	0.35	0.35	0.06	0.32	0.32	0.07	0.24	0.24	0.08	0.25	0.25
Sat Flow, veh/h	1774	3240	334	1774	2893	628	1774	2829	683	1774	2586	889
Grp Volume(v), veh/h	140	572	584	89	382	379	98	303	301	127	217	215
Grp Sat Flow(s),veh/h/ln	1774	1770	1804	1774	1770	1752	1774	1770	1742	1774	1770	1706
Q Serve(g_s), s	4.7	19.1	19.1	3.0	11.6	11.6	3.3	9.6	9.7	4.4	6.4	6.6
Cycle Q Clear(g_c), s	4.7	19.1	19.1	3.0	11.6	11.6	3.3	9.6	9.7	4.4	6.4	6.6
Prop In Lane	1.00		0.18	1.00		0.36	1.00		0.39	1.00		0.52
Lane Grp Cap(c), veh/h	177	622	634	114	559	553	125	430	424	144	449	433
V/C Ratio(X)	0.79	0.92	0.92	0.78	0.68	0.69	0.78	0.70	0.71	0.88	0.48	0.50
Avail Cap(c_a), veh/h	202	633	645	115	559	553	144	518	510	144	518	499
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	27.1	19.1	19.1	28.4	18.4	18.4	28.1	21.3	21.3	28.0	19.5	19.6
Incr Delay (d2), s/veh	17.0	18.6	18.5	28.5	3.4	3.5	21.2	3.4	3.6	42.1	0.8	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.2	12.4	12.7	2.4	6.2	6.1	2.4	5.1	5.1	3.8	3.2	3.2
LnGrp Delay(d),s/veh	44.0	37.8	37.7	56.8	21.8	21.9	49.3	24.6	24.9	70.0	20.3	20.5
LnGrp LOS	D	D	D	E	C	C	D	C	C	E	C	C
Approach Vol, veh/h	1296			850			702			559		
Approach Delay, s/veh	38.4			25.5			28.2			31.7		
Approach LOS	D			C			C			C		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.9	25.6	8.3	19.6	10.1	23.4	9.0	19.0				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	4.0	22.0	5.0	18.0	7.0	19.0	5.0	18.0				
Max Q Clear Time (g_c+I), s	15.0	21.1	5.3	8.6	6.7	13.6	6.4	11.7				
Green Ext Time (p_c), s	0.0	0.5	0.0	4.3	0.0	4.3	0.0	3.2				
Intersection Summary												
HCM 2010 Ctrl Delay	32.0											
HCM 2010 LOS	C											

HCM 2010 Signalized Intersection Summary

11: Overland Street & Magnolia Avenue

08/17/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	34	970	150	93	620	35	12	13	4	30	96	58
Future Volume (veh/h)	34	970	150	93	620	35	12	13	4	30	96	58
Number	5	2	12	1	6	16	3	8	18	7	4	14
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	1900	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	38	1090	169	104	697	39	13	15	4	34	108	65
Adj No. of Lanes	1	2	0	1	2	0	0	1	0	0	1	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	565	2014	312	362	2233	125	188	178	36	122	168	91
Arrive On Green	0.66	0.66	0.66	0.66	0.66	0.66	0.17	0.17	0.17	0.17	0.17	0.17
Sat Flow, veh/h	719	3073	475	439	3408	191	455	1046	215	180	990	536
Grp Volume(v), veh/h	38	627	632	104	362	374	32	0	0	207	0	0
Grp Sat Flow(s),veh/h/ln	719	1770	1779	439	1770	1829	1716	0	0	1706	0	0
Q Serve(g_s), s	1.1	8.6	8.7	7.6	4.0	4.1	0.0	0.0	0.0	2.5	0.0	0.0
Cycle Q Clear(g_c), s	5.2	8.6	8.7	16.3	4.0	4.1	0.7	0.0	0.0	5.2	0.0	0.0
Prop In Lane	1.00		0.27	1.00		0.10	0.41		0.12	0.16		0.31
Lane Grp Cap(c), veh/h	565	1160	1166	362	1160	1199	402	0	0	381	0	0
V/C Ratio(X)	0.07	0.54	0.54	0.29	0.31	0.31	0.08	0.00	0.00	0.54	0.00	0.00
Avail Cap(c_a), veh/h	628	1316	1323	400	1316	1360	738	0	0	757	0	0
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	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	4.5	4.2	4.2	8.6	3.4	3.4	16.0	0.0	0.0	17.9	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.4	0.4	0.4	0.2	0.1	0.1	0.0	0.0	1.2	0.0	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	4.1	4.2	0.9	2.0	2.0	0.3	0.0	0.0	2.6	0.0	0.0
LnGrp Delay(d),s/veh	4.6	4.6	4.6	9.0	3.6	3.6	16.1	0.0	0.0	19.1	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	B			B		
Approach Vol, veh/h	1297				840		32				207	
Approach Delay, s/veh	4.6				4.2		16.1				19.1	
Approach LOS	A				A		B				B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	34.0		11.8		34.0		11.8					
Change Period (Y+Rc), s	4.0		4.0		4.0		4.0					
Max Green Setting (Gmax), s	34.0		18.0		34.0		18.0					
Max Q Clear Time (g_c+l1), s	10.7		7.2		18.3		2.7					
Green Ext Time (p_c), s	15.6		1.0		11.7		1.2					
Intersection Summary												
HCM 2010 Ctrl Delay			5.9									
HCM 2010 LOS			A									

HCM 2010 Signalized Intersection Summary

12: Monroe Street & Magnolia Avenue

08/17/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	86	785	97	94	345	60	159	237	181	132	277	56
Future Volume (veh/h)	86	785	97	94	345	60	159	237	181	132	277	56
Number	5	2	12	1	6	16	3	8	18	7	4	14
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	1824	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	112	1019	126	122	448	78	206	308	235	171	360	73
Adj No. of Lanes	1	2	0	1	2	0	1	1	1	1	1	0
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	140	1118	138	152	1073	186	240	568	482	204	428	87
Arrive On Green	0.08	0.35	0.35	0.08	0.35	0.35	0.13	0.30	0.30	0.11	0.28	0.28
Sat Flow, veh/h	1737	3235	400	1810	3078	533	1810	1900	1615	1810	1534	311
Grp Volume(v), veh/h	112	568	577	122	262	264	206	308	235	171	0	433
Grp Sat Flow(s),veh/h/ln	1737	1805	1829	1810	1805	1806	1810	1900	1615	1810	0	1845
Q Serve(g_s), s	6.4	30.3	30.3	6.7	11.1	11.2	11.2	13.7	12.0	9.3	0.0	22.2
Cycle Q Clear(g_c), s	6.4	30.3	30.3	6.7	11.1	11.2	11.2	13.7	12.0	9.3	0.0	22.2
Prop In Lane	1.00		0.22	1.00		0.29	1.00		1.00	1.00		0.17
Lane Grp Cap(c), veh/h	140	624	632	152	629	629	240	568	482	204	0	515
V/C Ratio(X)	0.80	0.91	0.91	0.80	0.42	0.42	0.86	0.54	0.49	0.84	0.00	0.84
Avail Cap(c_a), veh/h	276	664	673	198	629	629	288	680	578	270	0	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	0.00	1.00
Uniform Delay (d), s/veh	45.4	31.5	31.5	45.3	25.0	25.0	42.8	29.5	29.0	43.7	0.0	34.2
Incr Delay (d2), s/veh	9.8	16.3	16.3	16.4	0.4	0.4	19.6	0.8	0.8	15.9	0.0	8.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.4	17.8	18.1	4.0	5.6	5.7	6.9	7.3	5.4	5.6	0.0	12.5
LnGrp Delay(d),s/veh	55.3	47.7	47.7	61.7	25.4	25.5	62.3	30.3	29.7	59.6	0.0	42.3
LnGrp LOS	E	D	D	E	C	C	E	C	C	E		D
Approach Vol, veh/h	1257			648			749			604		
Approach Delay, s/veh	48.4			32.3			38.9			47.2		
Approach LOS	D			C			D			D		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.4	38.8	17.3	32.1	12.1	39.1	15.4	34.1				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	11.6	37.0	16.0	35.0	16.0	32.0	15.0	36.0				
Max Q Clear Time (g_c+I1), s	19.7	32.3	13.2	24.2	8.4	13.2	11.3	15.7				
Green Ext Time (p_c), s	0.1	2.5	0.1	3.9	0.1	10.1	0.1	5.1				
Intersection Summary												
HCM 2010 Ctrl Delay	42.8											
HCM 2010 LOS	D											

HCM 2010 Signalized Intersection Summary

13: Campus View & Magnolia Avenue

09/05/2018

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations								
Traffic Volume (veh/h)	714	181	91	544	35	17		
Future Volume (veh/h)	714	181	91	544	35	17		
Number	2	12	1	6	3	18		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1863	1900	1863	1863	1863	1863		
Adj Flow Rate, veh/h	793	201	101	604	39	19		
Adj No. of Lanes	2	0	1	2	1	1		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	1531	388	132	2589	86	77		
Arrive On Green	0.55	0.55	0.07	0.73	0.05	0.05		
Sat Flow, veh/h	2891	709	1774	3632	1774	1583		
Grp Volume(v), veh/h	502	492	101	604	39	19		
Grp Sat Flow(s),veh/h/ln	1770	1738	1774	1770	1774	1583		
Q Serve(g_s), s	6.5	6.5	2.0	2.0	0.8	0.4		
Cycle Q Clear(g_c), s	6.5	6.5	2.0	2.0	0.8	0.4		
Prop In Lane		0.41	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	969	951	132	2589	86	77		
V/C Ratio(X)	0.52	0.52	0.76	0.23	0.45	0.25		
Avail Cap(c_a), veh/h	1603	1574	1120	5829	1558	1391		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00		
Uniform Delay (d), s/veh	5.2	5.2	16.5	1.6	16.9	16.7		
Incr Delay (d2), s/veh	0.4	0.4	8.8	0.0	3.6	1.6		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	3.2	3.1	1.3	0.9	0.5	0.2		
LnGrp Delay(d),s/veh	5.6	5.6	25.3	1.6	20.5	18.3		
LnGrp LOS	A	A	C	A	C	B		
Approach Vol, veh/h	994			705	58			
Approach Delay, s/veh	5.6			5.0	19.8			
Approach LOS	A			A	B			
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	6.7	23.9				30.7		5.8
Change Period (Y+Rc), s	4.0	4.0				4.0		4.0
Max Green Setting (Gmax), s	23.0	33.0				60.0		32.0
Max Q Clear Time (g_c+I1), s	4.0	8.5				4.0		2.8
Green Ext Time (p_c), s	0.2	11.4				14.9		0.1
Intersection Summary								
HCM 2010 Ctrl Delay			5.9					
HCM 2010 LOS			A					

HCM 2010 Signalized Intersection Summary

14: Jefferson Street & Magnolia Avenue

08/17/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	65	811	74	63	580	107	99	135	64	104	138	98
Future Volume (veh/h)	65	811	74	63	580	107	99	135	64	104	138	98
Number	5	2	12	1	6	16	3	8	18	7	4	14
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	81	1014	92	79	725	134	124	169	80	130	172	122
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	103	1192	108	100	1079	199	151	266	126	151	226	160
Arrive On Green	0.06	0.36	0.36	0.06	0.36	0.36	0.09	0.22	0.22	0.09	0.22	0.22
Sat Flow, veh/h	1774	3282	298	1774	2984	551	1774	1196	566	1774	1015	720
Grp Volume(v), veh/h	81	547	559	79	430	429	124	0	249	130	0	294
Grp Sat Flow(s),veh/h/ln	1774	1770	1810	1774	1770	1765	1774	0	1763	1774	0	1736
Q Serve(g_s), s	2.6	16.7	16.7	2.6	12.0	12.0	4.0	0.0	7.5	4.2	0.0	9.3
Cycle Q Clear(g_c), s	2.6	16.7	16.7	2.6	12.0	12.0	4.0	0.0	7.5	4.2	0.0	9.3
Prop In Lane	1.00		0.16	1.00		0.31	1.00		0.32	1.00		0.41
Lane Grp Cap(c), veh/h	103	643	658	100	640	639	151	0	392	151	0	386
V/C Ratio(X)	0.79	0.85	0.85	0.79	0.67	0.67	0.82	0.00	0.64	0.86	0.00	0.76
Avail Cap(c_a), veh/h	151	664	679	121	640	639	151	0	541	151	0	533
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	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.3	17.2	17.2	27.3	15.8	15.8	26.4	0.0	20.7	26.5	0.0	21.4
Incr Delay (d2), s/veh	15.1	10.0	9.9	24.2	2.7	2.8	28.7	0.0	1.7	36.2	0.0	4.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	9.8	10.0	1.9	6.3	6.3	3.2	0.0	3.9	3.6	0.0	4.9
LnGrp Delay(d),s/veh	42.4	27.2	27.1	51.6	18.5	18.5	55.1	0.0	22.4	62.7	0.0	25.6
LnGrp LOS	D	C	C	D	B	B	E		C	E		C
Approach Vol, veh/h	1187				938		373				424	
Approach Delay, s/veh	28.2				21.3		33.3				37.0	
Approach LOS	C				C		C				D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.3	25.3	9.0	17.0	7.4	25.2	9.0	17.0				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	4.0	22.0	5.0	18.0	5.0	21.0	5.0	18.0				
Max Q Clear Time (g_c+I), s	14.6	18.7	6.0	11.3	4.6	14.0	6.2	9.5				
Green Ext Time (p_c), s	0.0	2.6	0.0	1.7	0.0	5.4	0.0	2.0				
Intersection Summary												
HCM 2010 Ctrl Delay			27.9									
HCM 2010 LOS			C									

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↔	↔	
Traffic Vol, veh/h	0	0	0	540	449	0
Future Vol, veh/h	0	0	0	540	449	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	0	667	554	0
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1221	554	554	0	-	0
Stage 1	554	-	-	-	-	-
Stage 2	667	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	199	532	1016	-	-	-
Stage 1	575	-	-	-	-	-
Stage 2	510	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	199	532	1016	-	-	-
Mov Cap-2 Maneuver	199	-	-	-	-	-
Stage 1	575	-	-	-	-	-
Stage 2	510	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	0	0		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1016	-	-	-	-	
HCM Lane V/C Ratio	-	-	-	-	-	
HCM Control Delay (s)	0	-	0	-	-	
HCM Lane LOS	A	-	A	-	-	
HCM 95th %tile Q(veh)	0	-	-	-	-	

HCM 2010 Signalized Intersection Summary

1: Adams Street & Garfield Street

08/17/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	10	37	37	4	17	40	757	46	18	588	17
Future Volume (veh/h)	25	10	37	37	4	17	40	757	46	18	588	17
Number	5	2	12	1	6	16	3	8	18	7	4	14
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	1900	1863	1900	1900	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	26	10	38	38	4	17	41	772	47	18	600	17
Adj No. of Lanes	0	1	0	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	189	19	71	258	9	39	67	1866	114	33	1867	53
Arrive On Green	0.08	0.08	0.08	0.08	0.08	0.08	0.04	0.55	0.55	0.02	0.53	0.53
Sat Flow, veh/h	575	225	845	1040	109	465	1774	3390	206	1774	3515	100
Grp Volume(v), veh/h	74	0	0	59	0	0	41	403	416	18	302	315
Grp Sat Flow(s),veh/h/ln	1645	0	0	1615	0	0	1774	1770	1826	1774	1770	1845
Q Serve(g_s), s	0.3	0.0	0.0	0.0	0.0	0.0	0.8	4.6	4.6	0.3	3.3	3.3
Cycle Q Clear(g_c), s	1.4	0.0	0.0	1.1	0.0	0.0	0.8	4.6	4.6	0.3	3.3	3.3
Prop In Lane	0.35		0.51	0.64		0.29	1.00		0.11	1.00		0.05
Lane Grp Cap(c), veh/h	278	0	0	306	0	0	67	974	1005	33	940	980
V/C Ratio(X)	0.27	0.00	0.00	0.19	0.00	0.00	0.61	0.41	0.41	0.55	0.32	0.32
Avail Cap(c_a), veh/h	1041	0	0	1020	0	0	257	974	1005	206	940	980
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.1	0.0	0.0	15.0	0.0	0.0	16.4	4.5	4.5	16.8	4.6	4.6
Incr Delay (d2), s/veh	0.5	0.0	0.0	0.3	0.0	0.0	8.8	1.3	1.3	13.8	0.9	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	0.0	0.6	0.0	0.0	0.5	2.5	2.5	0.3	1.8	1.9
LnGrp Delay(d),s/veh	15.6	0.0	0.0	15.3	0.0	0.0	25.2	5.8	5.8	30.6	5.5	5.4
LnGrp LOS	B			B			C	A	A	C	A	A
Approach Vol, veh/h	74			59			860			635		
Approach Delay, s/veh	15.6			15.3			6.7			6.2		
Approach LOS	B			B			A			A		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		6.9	5.3	22.3		6.9	4.6	23.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		20.0	5.0	18.0		20.0	4.0	19.0				
Max Q Clear Time (g_c+I1), s		3.4	2.8	5.3		3.1	2.3	6.6				
Green Ext Time (p_c), s		0.6	0.0	6.5		0.6	0.0	6.4				
Intersection Summary												
HCM 2010 Ctrl Delay	7.2											
HCM 2010 LOS	A											

HCM 2010 Signalized Intersection Summary

2: Adams Street & Magnolia Avenue

09/05/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	158	909	381	175	907	134	454	476	194	174	410	118
Future Volume (veh/h)	158	909	381	175	907	134	454	476	194	174	410	118
Number	5	2	12	1	6	16	3	8	18	7	4	14
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	1788	1900	1900	1900	1895	1900	1900	1863	1976	1863	1863	1976
Adj Flow Rate, veh/h	161	928	389	179	926	137	463	486	198	178	418	120
Adj No. of Lanes	1	2	0	1	2	0	2	2	1	1	2	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	0	0	0	0	0	0	2	0	2	2	2
Cap, veh/h	192	941	391	193	1171	173	477	857	407	209	610	174
Arrive On Green	0.11	0.38	0.38	0.11	0.37	0.37	0.14	0.24	0.24	0.12	0.22	0.22
Sat Flow, veh/h	1703	2488	1034	1810	3148	466	3510	3539	1680	1774	2722	774
Grp Volume(v), veh/h	161	671	646	179	530	533	463	486	198	178	270	268
Grp Sat Flow(s),veh/h/ln	1703	1805	1718	1810	1800	1813	1755	1770	1680	1774	1770	1726
Q Serve(g_s), s	9.6	37.9	38.7	10.1	27.0	27.0	13.5	12.4	10.4	10.1	14.4	14.7
Cycle Q Clear(g_c), s	9.6	37.9	38.7	10.1	27.0	27.0	13.5	12.4	10.4	10.1	14.4	14.7
Prop In Lane	1.00		0.60	1.00		0.26	1.00		1.00	1.00		0.45
Lane Grp Cap(c), veh/h	192	683	650	193	670	674	477	857	407	209	397	387
V/C Ratio(X)	0.84	0.98	0.99	0.93	0.79	0.79	0.97	0.57	0.49	0.85	0.68	0.69
Avail Cap(c_a), veh/h	297	683	650	193	670	674	477	1201	570	241	601	586
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	44.8	31.7	32.0	45.7	28.8	28.8	44.4	34.3	33.6	44.6	36.6	36.7
Incr Delay (d2), s/veh	11.7	30.1	33.9	44.6	6.4	6.4	33.8	0.6	0.9	22.0	2.1	2.2
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	5.1	24.5	24.4	7.5	14.6	14.7	8.8	6.1	4.9	6.3	7.3	7.2
LnGrp Delay(d),s/veh	56.5	61.8	65.9	90.3	35.2	35.2	78.2	34.9	34.5	66.6	38.7	38.9
LnGrp LOS	E	E	E	F	D	D	E	C	C	E	D	D
Approach Vol, veh/h	1478			1242				1147			716	
Approach Delay, s/veh	63.0			43.1				52.3			45.7	
Approach LOS	E			D				D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	15.0	43.0	18.0	27.1	15.6	42.4	16.2	29.0				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	11.0	39.0	14.0	35.0	18.0	32.0	14.0	35.0				
Max Q Clear Time (g_c+I1), s	12.1	40.7	15.5	16.7	11.6	29.0	12.1	14.4				
Green Ext Time (p_c), s	0.0	0.0	0.0	6.4	0.2	2.7	0.1	6.8				
Intersection Summary												
HCM 2010 Ctrl Delay	52.2											
HCM 2010 LOS	D											

HCM 2010 Signalized Intersection Summary

3: Adams Street & Briarwood Drive

09/05/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	67	7	404	27	2	14	388	950	16	8	843	65
Future Volume (veh/h)	67	7	404	27	2	14	388	950	16	8	843	65
Number	5	2	12	1	6	16	3	8	18	7	4	14
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	1937	1863	1900	1937	1900	1863	1863	1976	1863	1863	1976
Adj Flow Rate, veh/h	72	8	434	29	2	15	417	1022	17	9	906	70
Adj No. of Lanes	1	1	1	0	1	0	2	2	0	1	2	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	475	558	456	256	27	111	490	2018	34	65	1533	118
Arrive On Green	0.29	0.29	0.29	0.29	0.29	0.29	0.28	1.00	1.00	0.04	0.46	0.46
Sat Flow, veh/h	1390	1937	1583	704	94	386	3442	3563	59	1774	3330	257
Grp Volume(v), veh/h	72	8	434	46	0	0	417	508	531	9	482	494
Grp Sat Flow(s),veh/h/ln	1390	1937	1583	1184	0	0	1721	1770	1852	1774	1770	1817
Q Serve(g_s), s	1.0	0.3	29.6	1.4	0.0	0.0	12.6	0.0	0.0	0.5	22.2	22.2
Cycle Q Clear(g_c), s	3.5	0.3	29.6	2.5	0.0	0.0	12.6	0.0	0.0	0.5	22.2	22.2
Prop In Lane	1.00		1.00	0.63		0.33	1.00		0.03	1.00		0.14
Lane Grp Cap(c), veh/h	475	558	456	394	0	0	490	1002	1049	65	815	837
V/C Ratio(X)	0.15	0.01	0.95	0.12	0.00	0.00	0.85	0.51	0.51	0.14	0.59	0.59
Avail Cap(c_a), veh/h	479	564	461	398	0	0	782	1002	1049	355	815	837
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.49	0.49	0.49
Uniform Delay (d), s/veh	29.1	28.0	38.4	28.7	0.0	0.0	38.2	0.0	0.0	51.3	22.0	22.0
Incr Delay (d2), s/veh	0.1	0.0	29.8	0.1	0.0	0.0	5.2	1.8	1.7	0.5	1.6	1.5
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	1.6	0.2	16.7	1.0	0.0	0.0	6.3	0.5	0.5	0.3	11.2	11.5
LnGrp Delay(d),s/veh	29.2	28.0	68.2	28.8	0.0	0.0	43.4	1.8	1.7	51.8	23.5	23.5
LnGrp LOS	C	C	E	C			D	A	A	D	C	C
Approach Vol, veh/h		514			46			1456			985	
Approach Delay, s/veh		62.1			28.8			13.7			23.8	
Approach LOS		E			C			B			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		35.7	19.7	54.6		35.7	8.0	66.3				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		32.0	25.0	41.0		32.0	22.0	44.0				
Max Q Clear Time (g_c+I1), s		31.6	14.6	24.2		4.5	2.5	2.0				
Green Ext Time (p_c), s		0.1	1.1	10.8		2.2	0.0	17.8				
Intersection Summary												
HCM 2010 Ctrl Delay			25.5									
HCM 2010 LOS			C									

HCM 2010 TWSC
4: Adams Street & Plaza Driveway

08/17/2018

Intersection						
Int Delay, s/veh	1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗	↘	↗↗	↗↘	
Traffic Vol, veh/h	0	89	90	1387	1332	17
Future Vol, veh/h	0	89	90	1387	1332	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	97	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	94	95	1460	1402	18
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	-	710	1420	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	4.14	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	0	376	475	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	376	475	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	17.7	0.9		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	475	-	376	-	-	
HCM Lane V/C Ratio	0.199	-	0.249	-	-	
HCM Control Delay (s)	14.5	-	17.7	-	-	
HCM Lane LOS	B	-	C	-	-	
HCM 95th %tile Q(veh)	0.7	-	1	-	-	

Intersection												
Int Delay, s/veh	0.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗			↗		↕			↕	
Traffic Vol, veh/h	0	0	115	0	0	9	0	1483	39	0	1430	22
Future Vol, veh/h	0	0	115	0	0	9	0	1483	39	0	1430	22
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	120	0	0	9	0	1545	41	0	1490	23

Major/Minor	Minor2		Minor1		Major1		Major2	
Conflicting Flow All	-	-	756	-	-	793	-	0
Stage 1	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	7.1	-	-	6.9	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.9	-	-	3.3	-	-
Pot Cap-1 Maneuver	0	0	304	0	0	336	0	-
Stage 1	0	0	-	0	0	-	0	-
Stage 2	0	0	-	0	0	-	0	-
Platoon blocked, %	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	304	-	-	336	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	24.3	16	0	0
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1WBLn1	SBT	SBR
Capacity (veh/h)	-	-	304	336	-
HCM Lane V/C Ratio	-	-	0.394	0.028	-
HCM Control Delay (s)	-	-	24.3	16	-
HCM Lane LOS	-	-	C	C	-
HCM 95th %tile Q(veh)	-	-	1.8	0.1	-

HCM 2010 Signalized Intersection Summary

6: Adams Street & SR 91 WB Ramps

08/17/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	205	0	564	327	900	3	0	866	626
Future Volume (veh/h)	0	0	0	205	0	564	327	900	3	0	866	626
Number				1	6	16	3	8	18	7	4	14
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				1900	1863	1863	1863	1863	1900	0	1863	1900
Adj Flow Rate, veh/h				211	278	396	337	928	3	0	893	645
Adj No. of Lanes				0	1	1	1	2	0	0	3	0
Peak Hour Factor				0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %				2	2	2	2	2	2	0	2	2
Cap, veh/h				222	292	446	362	2336	8	0	1373	641
Arrive On Green				0.28	0.28	0.28	0.41	1.00	1.00	0.00	0.54	0.54
Sat Flow, veh/h				787	1037	1583	1774	3619	12	0	3558	1583
Grp Volume(v), veh/h				489	0	396	337	454	477	0	893	645
Grp Sat Flow(s),veh/h/ln				1823	0	1583	1774	1770	1861	0	1695	1583
Q Serve(g_s), s				29.0	0.0	26.4	19.9	0.0	0.0	0.0	20.6	44.6
Cycle Q Clear(g_c), s				29.0	0.0	26.4	19.9	0.0	0.0	0.0	20.6	44.6
Prop In Lane				0.43		1.00	1.00		0.01	0.00		1.00
Lane Grp Cap(c), veh/h				514	0	446	362	1143	1201	0	1373	641
V/C Ratio(X)				0.95	0.00	0.89	0.93	0.40	0.40	0.00	0.65	1.01
Avail Cap(c_a), veh/h				514	0	446	452	1143	1201	0	1373	641
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.33	1.33
Upstream Filter(I)				1.00	0.00	1.00	0.09	0.09	0.09	0.00	1.00	1.00
Uniform Delay (d), s/veh				38.8	0.0	37.8	31.8	0.0	0.0	0.0	19.8	25.4
Incr Delay (d2), s/veh				28.0	0.0	19.1	3.2	0.1	0.1	0.0	2.4	37.0
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				18.5	0.0	13.9	9.9	0.0	0.0	0.0	10.0	25.7
LnGrp Delay(d),s/veh				66.8	0.0	57.0	35.0	0.1	0.1	0.0	22.2	62.3
LnGrp LOS				E		E	D	A	A		C	F
Approach Vol, veh/h					885			1268			1538	
Approach Delay, s/veh					62.4			9.4			39.1	
Approach LOS					E			A			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			26.5	48.6		35.0		75.0				
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0				
Max Green Setting (Gmax), s			28.0	39.0		31.0		71.0				
Max Q Clear Time (g_c+I1), s			21.9	46.6		31.0		2.0				
Green Ext Time (p_c), s			0.5	0.0		0.0		32.2				
Intersection Summary												
HCM 2010 Ctrl Delay				34.5								
HCM 2010 LOS				C								
Notes												
User approved volume balancing among the lanes for turning movement.												

HCM 2010 Signalized Intersection Summary

7: Adams Street & SR 91 EB Ramps

08/17/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations								  			 	
Traffic Volume (veh/h)	774	9	650	0	0	0	0	459	345	616	459	0
Future Volume (veh/h)	774	9	650	0	0	0	0	459	345	616	459	0
Number	5	2	12				3	8	18	7	4	14
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	1900	1863	1863				0	1863	1900	1863	1863	0
Adj Flow Rate, veh/h	832	10	699				0	494	371	662	494	0
Adj No. of Lanes	0	1	1				0	3	0	1	2	0
Peak Hour Factor	0.93	0.93	0.93				0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	718	9	648				0	524	245	581	1834	0
Arrive On Green	0.41	0.41	0.41				0.00	0.21	0.21	0.11	0.17	0.00
Sat Flow, veh/h	1754	21	1583				0	3558	1583	1774	3632	0
Grp Volume(v), veh/h	842	0	699				0	494	371	662	494	0
Grp Sat Flow(s),veh/h/ln	1775	0	1583				0	1695	1583	1774	1770	0
Q Serve(g_s), s	45.0	0.0	45.0				0.0	15.8	17.0	36.0	13.3	0.0
Cycle Q Clear(g_c), s	45.0	0.0	45.0				0.0	15.8	17.0	36.0	13.3	0.0
Prop In Lane	0.99		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	726	0	648				0	524	245	581	1834	0
V/C Ratio(X)	1.16	0.00	1.08				0.00	0.94	1.52	1.14	0.27	0.00
Avail Cap(c_a), veh/h	726	0	648				0	524	245	581	1834	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.33	1.33	0.33	0.33	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.81	0.81	0.55	0.55	0.00
Uniform Delay (d), s/veh	32.5	0.0	32.5				0.0	43.2	43.7	49.1	27.5	0.0
Incr Delay (d2), s/veh	86.7	0.0	58.6				0.0	23.8	248.6	74.9	0.2	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	39.5	0.0	30.2				0.0	9.1	24.3	29.8	6.6	0.0
LnGrp Delay(d),s/veh	119.2	0.0	91.1				0.0	67.1	292.3	123.9	27.7	0.0
LnGrp LOS	F		F				E	F	F	F	C	
Approach Vol, veh/h	1541						865			1156		
Approach Delay, s/veh	106.5						163.7			82.8		
Approach LOS	F						F			F		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2		4				7	8				
Phs Duration (G+Y+Rc), s	49.0		61.0				40.0	21.0				
Change Period (Y+Rc), s	4.0		4.0				4.0	4.0				
Max Green Setting (Gmax), s	45.0		57.0				36.0	17.0				
Max Q Clear Time (g_c+l1), s	47.0		15.3				38.0	19.0				
Green Ext Time (p_c), s	0.0		10.9				0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay	112.7											
HCM 2010 LOS	F											

HCM 2010 Signalized Intersection Summary

8: Adams Street & Indiana Avenue

08/17/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	169	321	52	33	202	183	37	487	46	261	676	137
Future Volume (veh/h)	169	321	52	33	202	183	37	487	46	261	676	137
Number	5	2	12	1	6	16	3	8	18	7	4	14
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	194	369	60	38	232	210	43	560	53	300	777	157
Adj No. of Lanes	1	2	0	1	2	0	1	2	0	1	2	0
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	250	810	131	48	273	236	207	802	76	562	1307	264
Arrive On Green	0.14	0.27	0.27	0.03	0.15	0.15	0.12	0.25	0.25	0.63	0.89	0.89
Sat Flow, veh/h	1774	3053	492	1774	1799	1558	1774	3269	309	1774	2935	593
Grp Volume(v), veh/h	194	213	216	38	228	214	43	303	310	300	469	465
Grp Sat Flow(s),veh/h/ln	1774	1770	1776	1774	1770	1588	1774	1770	1808	1774	1770	1758
Q Serve(g_s), s	11.6	11.0	11.2	2.3	13.8	14.5	2.4	17.1	17.2	10.3	6.8	6.8
Cycle Q Clear(g_c), s	11.6	11.0	11.2	2.3	13.8	14.5	2.4	17.1	17.2	10.3	6.8	6.8
Prop In Lane	1.00		0.28	1.00		0.98	1.00		0.17	1.00		0.34
Lane Grp Cap(c), veh/h	250	469	471	48	268	241	207	434	444	562	788	783
V/C Ratio(X)	0.78	0.45	0.46	0.79	0.85	0.89	0.21	0.70	0.70	0.53	0.59	0.59
Avail Cap(c_a), veh/h	339	515	517	97	273	245	207	434	444	562	788	783
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.98	0.98	0.98	0.77	0.77	0.77
Uniform Delay (d), s/veh	45.6	33.8	33.8	53.2	45.4	45.8	44.0	37.8	37.8	15.7	3.7	3.7
Incr Delay (d2), s/veh	7.7	0.7	0.7	24.1	21.4	30.0	0.5	8.8	8.7	0.8	2.5	2.5
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	6.2	5.5	5.6	1.5	8.4	8.4	1.2	9.4	9.6	4.9	3.4	3.4
LnGrp Delay(d),s/veh	53.3	34.4	34.5	77.3	66.8	75.7	44.5	46.5	46.5	16.4	6.2	6.2
LnGrp LOS	D	C	C	E	E	E	D	D	D	B	A	A
Approach Vol, veh/h	623			480			656			1234		
Approach Delay, s/veh	40.3			71.6			46.4			8.7		
Approach LOS	D			E			D			A		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.0	33.2	16.8	53.0	19.5	20.7	38.8	31.0				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	4.0	32.0	7.0	49.0	21.0	17.0	29.0	27.0				
Max Q Clear Time (g_c+I), s	14.3	13.2	4.4	8.8	13.6	16.5	12.3	19.2				
Green Ext Time (p_c), s	0.0	3.0	0.3	6.4	1.9	0.1	0.9	2.1				
Intersection Summary												
HCM 2010 Ctrl Delay	33.6											
HCM 2010 LOS	C											

HCM 2010 Signalized Intersection Summary

9: Adams Street & Lincoln Avenue

08/17/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	51	134	13	11	254	71	4	189	7	119	355	93
Future Volume (veh/h)	51	134	13	11	254	71	4	189	7	119	355	93
Number	5	2	12	1	6	16	3	8	18	7	4	14
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	62	163	16	13	310	87	5	230	9	145	433	113
Adj No. of Lanes	1	2	0	1	2	0	1	2	0	1	2	0
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	81	740	72	23	533	147	10	1205	47	186	1242	322
Arrive On Green	0.05	0.23	0.23	0.01	0.19	0.19	0.01	0.35	0.35	0.10	0.45	0.45
Sat Flow, veh/h	1774	3260	317	1774	2742	757	1774	3473	135	1774	2785	721
Grp Volume(v), veh/h	62	88	91	13	198	199	5	117	122	145	274	272
Grp Sat Flow(s),veh/h/ln	1774	1770	1807	1774	1770	1729	1774	1770	1839	1774	1770	1736
Q Serve(g_s), s	1.8	2.1	2.1	0.4	5.3	5.4	0.1	2.4	2.4	4.1	5.3	5.3
Cycle Q Clear(g_c), s	1.8	2.1	2.1	0.4	5.3	5.4	0.1	2.4	2.4	4.1	5.3	5.3
Prop In Lane	1.00		0.18	1.00		0.44	1.00		0.07	1.00		0.42
Lane Grp Cap(c), veh/h	81	401	410	23	344	336	10	614	638	186	790	774
V/C Ratio(X)	0.77	0.22	0.22	0.56	0.58	0.59	0.53	0.19	0.19	0.78	0.35	0.35
Avail Cap(c_a), veh/h	137	648	662	137	648	633	137	614	638	274	790	774
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	24.5	16.3	16.3	25.4	19.0	19.0	25.7	11.8	11.9	22.6	9.4	9.4
Incr Delay (d2), s/veh	14.0	0.3	0.3	19.1	1.5	1.7	38.4	0.7	0.7	8.4	1.2	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	1.1	1.1	0.3	2.7	2.7	0.2	1.3	1.3	2.4	2.8	2.8
LnGrp Delay(d),s/veh	38.5	16.6	16.6	44.5	20.5	20.7	64.2	12.5	12.5	31.0	10.6	10.7
LnGrp LOS	D	B	B	D	C	C	E	B	B	C	B	B
Approach Vol, veh/h	241			410			244			691		
Approach Delay, s/veh	22.2			21.3			13.6			14.9		
Approach LOS	C			C			B			B		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	4.7	15.8	4.3	27.1	6.4	14.1	9.4	22.0				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	4.0	19.0	4.0	22.0	4.0	19.0	8.0	18.0				
Max Q Clear Time (g_c+I2), s	4.1	4.1	2.1	7.3	3.8	7.4	6.1	4.4				
Green Ext Time (p_c), s	0.0	3.0	0.0	3.7	0.0	2.7	0.1	3.6				
Intersection Summary												
HCM 2010 Ctrl Delay	17.5											
HCM 2010 LOS	B											

HCM 2010 Signalized Intersection Summary

10: Jackson Street & Magnolia Avenue

08/17/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	124	1232	95	67	994	66	77	279	33	87	321	187
Future Volume (veh/h)	124	1232	95	67	994	66	77	279	33	87	321	187
Number	5	2	12	1	6	16	3	8	18	7	4	14
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	136	1354	104	74	1092	73	85	307	36	96	353	205
Adj No. of Lanes	1	2	0	1	2	0	1	2	0	1	2	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	172	1296	99	94	1161	78	108	734	85	117	509	291
Arrive On Green	0.10	0.39	0.39	0.05	0.34	0.34	0.06	0.23	0.23	0.07	0.23	0.23
Sat Flow, veh/h	1774	3332	255	1774	3368	225	1774	3195	372	1774	2173	1240
Grp Volume(v), veh/h	136	717	741	74	574	591	85	169	174	96	286	272
Grp Sat Flow(s),veh/h/ln	1774	1770	1818	1774	1770	1823	1774	1770	1797	1774	1770	1644
Q Serve(g_s), s	4.6	23.7	23.7	2.5	19.1	19.2	2.9	4.9	5.0	3.3	9.0	9.2
Cycle Q Clear(g_c), s	4.6	23.7	23.7	2.5	19.1	19.2	2.9	4.9	5.0	3.3	9.0	9.2
Prop In Lane	1.00		0.14	1.00		0.12	1.00		0.21	1.00		0.75
Lane Grp Cap(c), veh/h	172	688	707	94	610	629	108	406	413	117	415	385
V/C Ratio(X)	0.79	1.04	1.05	0.79	0.94	0.94	0.78	0.42	0.42	0.82	0.69	0.71
Avail Cap(c_a), veh/h	175	688	707	117	610	629	117	523	531	117	523	486
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	26.9	18.6	18.6	28.5	19.3	19.3	28.2	20.0	20.0	28.1	21.3	21.4
Incr Delay (d2), s/veh	21.0	45.6	47.0	24.4	22.7	22.4	27.2	0.7	0.7	35.9	2.8	3.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.2	20.0	20.8	1.8	13.1	13.4	2.2	2.5	2.5	2.7	4.7	4.5
LnGrp Delay(d),s/veh	47.9	64.2	65.6	52.9	42.0	41.7	55.4	20.7	20.7	64.0	24.1	24.8
LnGrp LOS	D	F	F	D	D	D	E	C	C	E	C	C
Approach Vol, veh/h	1594			1239			428			654		
Approach Delay, s/veh	63.5			42.5			27.6			30.2		
Approach LOS	E			D			C			C		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.2	27.7	7.7	18.3	9.9	25.0	8.0	18.0				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	4.0	23.0	4.0	18.0	6.0	21.0	4.0	18.0				
Max Q Clear Time (g_c+I), s	14.5	25.7	4.9	11.2	6.6	21.2	5.3	7.0				
Green Ext Time (p_c), s	0.0	0.0	0.0	3.0	0.0	0.0	0.0	4.2				
Intersection Summary												
HCM 2010 Ctrl Delay	47.4											
HCM 2010 LOS	D											

HCM 2010 Signalized Intersection Summary

11: Overland Street & Magnolia Avenue

08/17/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	32	1357	29	15	1130	11	15	8	7	3	9	18
Future Volume (veh/h)	32	1357	29	15	1130	11	15	8	7	3	9	18
Number	5	2	12	1	6	16	3	8	18	7	4	14
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	1900	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	33	1414	30	16	1177	11	16	8	7	3	9	19
Adj No. of Lanes	1	2	0	1	2	0	0	1	0	0	1	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	476	2634	56	396	2670	25	183	21	18	110	25	53
Arrive On Green	0.74	0.74	0.74	0.74	0.74	0.74	0.05	0.05	0.05	0.05	0.05	0.05
Sat Flow, veh/h	470	3544	75	368	3593	34	835	418	365	165	495	1045
Grp Volume(v), veh/h	33	705	739	16	580	608	31	0	0	31	0	0
Grp Sat Flow(s),veh/h/ln	470	1770	1849	368	1770	1857	1618	0	0	1706	0	0
Q Serve(g_s), s	1.1	6.6	6.6	0.8	4.8	4.8	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	6.0	6.6	6.6	7.4	4.8	4.8	0.6	0.0	0.0	0.6	0.0	0.0
Prop In Lane	1.00		0.04	1.00		0.02	0.52		0.23	0.10		0.61
Lane Grp Cap(c), veh/h	476	1315	1375	396	1315	1380	222	0	0	188	0	0
V/C Ratio(X)	0.07	0.54	0.54	0.04	0.44	0.44	0.14	0.00	0.00	0.17	0.00	0.00
Avail Cap(c_a), veh/h	539	1553	1623	446	1553	1630	854	0	0	864	0	0
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	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	3.0	2.1	2.1	3.7	1.9	1.9	17.8	0.0	0.0	17.8	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.3	0.3	0.0	0.2	0.2	0.3	0.0	0.0	0.4	0.0	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	3.1	3.2	0.1	2.3	2.5	0.3	0.0	0.0	0.3	0.0	0.0
LnGrp Delay(d),s/veh	3.1	2.5	2.5	3.7	2.1	2.1	18.1	0.0	0.0	18.2	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	B			B		
Approach Vol, veh/h	1477				1204		31				31	
Approach Delay, s/veh	2.5				2.1		18.1				18.2	
Approach LOS	A				A		B				B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	32.8		5.9		32.8		5.9					
Change Period (Y+Rc), s	4.0		4.0		4.0		4.0					
Max Green Setting (Gmax), s	34.0		18.0		34.0		18.0					
Max Q Clear Time (g_c+l1), s	8.6		2.6		9.4		2.6					
Green Ext Time (p_c), s	19.9		0.2		19.4		0.2					
Intersection Summary												
HCM 2010 Ctrl Delay			2.7									
HCM 2010 LOS			A									

HCM 2010 Signalized Intersection Summary

12: Monroe Street & Magnolia Avenue

08/17/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	74	1163	72	169	925	96	79	281	120	93	312	58
Future Volume (veh/h)	74	1163	72	169	925	96	79	281	120	93	312	58
Number	5	2	12	1	6	16	3	8	18	7	4	14
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	1824	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	84	1322	82	192	1051	109	90	319	136	106	355	66
Adj No. of Lanes	1	2	0	1	2	0	1	1	1	1	1	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	106	1375	85	220	1515	157	114	488	415	132	416	77
Arrive On Green	0.06	0.40	0.40	0.12	0.46	0.46	0.06	0.26	0.26	0.07	0.27	0.27
Sat Flow, veh/h	1737	3454	214	1810	3302	342	1810	1900	1615	1810	1559	290
Grp Volume(v), veh/h	84	690	714	192	574	586	90	319	136	106	0	421
Grp Sat Flow(s),veh/h/ln	1737	1805	1862	1810	1805	1840	1810	1900	1615	1810	0	1849
Q Serve(g_s), s	5.1	39.7	40.0	11.1	26.9	27.0	5.2	16.0	7.3	6.2	0.0	23.1
Cycle Q Clear(g_c), s	5.1	39.7	40.0	11.1	26.9	27.0	5.2	16.0	7.3	6.2	0.0	23.1
Prop In Lane	1.00		0.11	1.00		0.19	1.00		1.00	1.00		0.16
Lane Grp Cap(c), veh/h	106	719	742	220	828	844	114	488	415	132	0	493
V/C Ratio(X)	0.79	0.96	0.96	0.87	0.69	0.69	0.79	0.65	0.33	0.80	0.00	0.85
Avail Cap(c_a), veh/h	146	727	750	220	828	844	136	623	530	136	0	606
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	0.00	1.00
Uniform Delay (d), s/veh	49.4	31.3	31.4	46.1	22.9	22.9	49.3	35.4	32.2	48.7	0.0	37.1
Incr Delay (d2), s/veh	17.8	23.7	24.0	29.3	2.5	2.5	22.3	1.6	0.5	27.6	0.0	9.6
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	8.0	24.5	25.4	7.3	14.0	14.2	3.3	8.6	3.3	4.1	0.0	13.1
LnGrp Delay(d),s/veh	67.3	55.0	55.3	75.4	25.4	25.4	71.6	37.0	32.6	76.3	0.0	46.8
LnGrp LOS	E	D	E	E	C	C	E	D	C	E		D
Approach Vol, veh/h	1488			1352			545			527		
Approach Delay, s/veh	55.8			32.5			41.6			52.7		
Approach LOS	E			C			D			D		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.0	46.5	10.7	32.5	10.5	53.0	11.8	31.4				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (G_max), s	13.0	43.0	8.0	35.0	9.0	47.0	8.0	35.0				
Max Q Clear Time (g_c+1.5), s	13.0	42.0	7.2	25.1	7.1	29.0	8.2	18.0				
Green Ext Time (p_c), s	0.0	0.5	0.0	3.4	0.0	14.4	0.0	4.4				
Intersection Summary												
HCM 2010 Ctrl Delay	45.4											
HCM 2010 LOS	D											

HCM 2010 Signalized Intersection Summary

13: Campus View & Magnolia Avenue

09/05/2018

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations								
Traffic Volume (veh/h)	1118	129	65	1134	135	67		
Future Volume (veh/h)	1118	129	65	1134	135	67		
Number	2	12	1	6	3	18		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1863	1900	1863	1863	1863	1863		
Adj Flow Rate, veh/h	1189	137	69	1206	144	71		
Adj No. of Lanes	2	0	1	2	1	1		
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	1957	225	89	2598	214	191		
Arrive On Green	0.61	0.61	0.05	0.73	0.12	0.12		
Sat Flow, veh/h	3293	368	1774	3632	1774	1583		
Grp Volume(v), veh/h	656	670	69	1206	144	71		
Grp Sat Flow(s),veh/h/ln	1770	1798	1774	1770	1774	1583		
Q Serve(g_s), s	12.6	12.7	2.1	7.6	4.3	2.3		
Cycle Q Clear(g_c), s	12.6	12.7	2.1	7.6	4.3	2.3		
Prop In Lane		0.20	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	1082	1100	89	2598	214	191		
V/C Ratio(X)	0.61	0.61	0.78	0.46	0.67	0.37		
Avail Cap(c_a), veh/h	1252	1272	547	3851	1030	919		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00		
Uniform Delay (d), s/veh	6.6	6.6	25.9	3.0	23.2	22.3		
Incr Delay (d2), s/veh	0.6	0.7	13.7	0.1	3.6	1.2		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	6.2	6.3	1.4	3.6	2.3	1.1		
LnGrp Delay(d),s/veh	7.3	7.3	39.6	3.1	26.8	23.5		
LnGrp LOS	A	A	D	A	C	C		
Approach Vol, veh/h	1326			1275	215			
Approach Delay, s/veh	7.3			5.1	25.7			
Approach LOS	A			A	C			
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	6.8	37.7				44.5		10.7
Change Period (Y+Rc), s	4.0	4.0				4.0		4.0
Max Green Setting (Gmax), s	17.0	39.0				60.0		32.0
Max Q Clear Time (g_c+I1), s	4.1	14.7				9.6		6.3
Green Ext Time (p_c), s	0.1	18.6				30.9		0.6
Intersection Summary								
HCM 2010 Ctrl Delay			7.7					
HCM 2010 LOS			A					

HCM 2010 Signalized Intersection Summary

14: Jefferson Street & Magnolia Avenue

08/17/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	87	898	84	57	911	96	58	192	50	66	217	75
Future Volume (veh/h)	87	898	84	57	911	96	58	192	50	66	217	75
Number	5	2	12	1	6	16	3	8	18	7	4	14
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	93	955	89	61	969	102	62	204	53	70	231	80
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	119	1201	112	77	1109	117	78	408	106	89	386	134
Arrive On Green	0.07	0.37	0.37	0.04	0.34	0.34	0.04	0.29	0.29	0.05	0.29	0.29
Sat Flow, veh/h	1774	3273	305	1774	3232	340	1774	1427	371	1774	1324	458
Grp Volume(v), veh/h	93	516	528	61	530	541	62	0	257	70	0	311
Grp Sat Flow(s),veh/h/ln	1774	1770	1809	1774	1770	1803	1774	0	1797	1774	0	1782
Q Serve(g_s), s	3.3	16.4	16.4	2.1	17.7	17.7	2.2	0.0	7.5	2.5	0.0	9.4
Cycle Q Clear(g_c), s	3.3	16.4	16.4	2.1	17.7	17.7	2.2	0.0	7.5	2.5	0.0	9.4
Prop In Lane	1.00		0.17	1.00		0.19	1.00		0.21	1.00		0.26
Lane Grp Cap(c), veh/h	119	649	664	77	607	619	78	0	514	89	0	520
V/C Ratio(X)	0.78	0.79	0.79	0.80	0.87	0.87	0.80	0.00	0.50	0.79	0.00	0.60
Avail Cap(c_a), veh/h	141	649	664	113	618	630	113	0	514	113	0	520
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	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.9	17.8	17.8	29.9	19.4	19.4	29.8	0.0	18.7	29.6	0.0	19.1
Incr Delay (d2), s/veh	21.0	6.8	6.7	21.0	13.0	12.8	21.5	0.0	3.5	24.6	0.0	5.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	9.1	9.3	1.5	10.7	10.9	1.5	0.0	4.2	1.8	0.0	5.3
LnGrp Delay(d),s/veh	49.9	24.6	24.5	50.8	32.4	32.2	51.3	0.0	22.2	54.1	0.0	24.1
LnGrp LOS	D	C	C	D	C	C	D		C	D		C
Approach Vol, veh/h	1137			1132			319			381		
Approach Delay, s/veh	26.6			33.3			27.9			29.7		
Approach LOS	C			C			C			C		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.7	27.1	6.8	22.4	8.2	25.6	7.1	22.0				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	4.0	23.0	4.0	18.0	5.0	22.0	4.0	18.0				
Max Q Clear Time (g_c+I), s	14.1	18.4	4.2	11.4	5.3	19.7	4.5	9.5				
Green Ext Time (p_c), s	0.0	3.9	0.0	1.8	0.0	1.9	0.0	2.1				
Intersection Summary												
HCM 2010 Ctrl Delay	29.7											
HCM 2010 LOS	C											

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↔	↔	
Traffic Vol, veh/h	0	0	0	423	446	0
Future Vol, veh/h	0	0	0	423	446	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	0	492	519	0
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1011	519	519	0	-	0
Stage 1	519	-	-	-	-	-
Stage 2	492	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	265	557	1047	-	-	-
Stage 1	597	-	-	-	-	-
Stage 2	615	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	265	557	1047	-	-	-
Mov Cap-2 Maneuver	265	-	-	-	-	-
Stage 1	597	-	-	-	-	-
Stage 2	615	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	0	0		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1047	-	-	-	-	
HCM Lane V/C Ratio	-	-	-	-	-	
HCM Control Delay (s)	0	-	0	-	-	
HCM Lane LOS	A	-	A	-	-	
HCM 95th %tile Q(veh)	0	-	-	-	-	

Queues

1: Adams Street & Garfield Street

08/17/2018

	→	←	↖	↑	↘	↓
Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	250	173	105	950	53	1079
v/c Ratio	0.54	0.55	0.38	0.51	0.22	0.71
Control Delay	12.4	19.4	25.1	9.6	23.3	15.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.4	19.4	25.1	9.6	23.3	15.3
Queue Length 50th (ft)	24	28	28	51	14	124
Queue Length 95th (ft)	62	66	65	158	39	194
Internal Link Dist (ft)	1516	839		1277		1231
Turn Bay Length (ft)			50		50	
Base Capacity (vph)	862	640	293	2116	251	1754
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.27	0.36	0.45	0.21	0.62
Intersection Summary						

Queues

2: Adams Street & Magnolia Avenue

09/05/2018



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	108	886	181	762	422	681	298	272	950
v/c Ratio	0.79	0.88	1.12	0.72	0.85	0.63	0.42	0.88	0.82
Control Delay	89.1	49.5	152.3	36.3	63.8	37.2	8.4	73.9	41.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	89.1	49.5	152.3	36.3	63.8	37.2	8.4	73.9	41.7
Queue Length 50th (ft)	80	320	~155	236	157	227	25	196	333
Queue Length 95th (ft)	#171	#414	#289	298	#224	284	89	#326	403
Internal Link Dist (ft)		1368		2600		1492			1277
Turn Bay Length (ft)	180		135		145		245	105	
Base Capacity (vph)	139	1002	162	1055	515	1086	702	326	1166
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.88	1.12	0.72	0.82	0.63	0.42	0.83	0.81

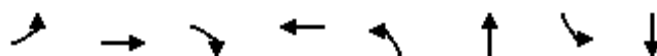
Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues

3: Adams Street & Briarwood Drive

09/05/2018



Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	20	4	125	81	655	1275	11	1098
v/c Ratio	0.06	0.01	0.26	0.21	0.80	0.61	0.13	0.79
Control Delay	35.1	34.0	7.5	30.5	47.9	15.6	56.7	37.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0
Total Delay	35.1	34.0	7.5	30.5	47.9	15.9	56.7	37.8
Queue Length 50th (ft)	12	2	0	40	246	271	8	385
Queue Length 95th (ft)	30	11	38	75	m262	325	26	465
Internal Link Dist (ft)		97		247		351		1492
Turn Bay Length (ft)					250		48	
Base Capacity (vph)	353	546	513	415	1228	2107	110	1383
Starvation Cap Reductn	0	0	0	0	0	225	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.01	0.24	0.20	0.53	0.68	0.10	0.79

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Queues

6: Adams Street & SR 91 WB Ramps

08/17/2018



Lane Group	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	677	642	240	1252	1247
v/c Ratio	0.93	0.94	0.88	0.71	0.91dr
Control Delay	50.2	53.1	78.7	23.0	14.0
Queue Delay	49.7	0.0	22.5	8.2	0.4
Total Delay	99.8	53.1	101.2	31.2	14.4
Queue Length 50th (ft)	475	453	165	218	47
Queue Length 95th (ft)	#595	#608	m#227	242	m43
Internal Link Dist (ft)	487			185	10
Turn Bay Length (ft)					
Base Capacity (vph)	749	701	289	1755	1522
Starvation Cap Reductn	0	0	48	470	0
Spillback Cap Reductn	296	0	0	0	53
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.49	0.92	1.00	0.97	0.85

Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.
- dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Queues

7: Adams Street & SR 91 EB Ramps

08/17/2018

	→	↘	↑	↙	↓
Lane Group	EBT	EBR	NBT	SBL	SBT
Lane Group Flow (vph)	717	586	811	318	622
v/c Ratio	0.90	0.72	0.68	0.89	0.36
Control Delay	45.4	23.0	29.3	61.8	37.0
Queue Delay	2.5	53.9	1.8	57.1	28.5
Total Delay	47.9	76.9	31.1	118.9	65.5
Queue Length 50th (ft)	476	241	211	258	237
Queue Length 95th (ft)	#710	380	190	m307	m281
Internal Link Dist (ft)	522		75		185
Turn Bay Length (ft)					
Base Capacity (vph)	843	848	1190	385	1708
Starvation Cap Reductn	0	0	221	153	1105
Spillback Cap Reductn	54	378	48	0	451
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.91	1.25	0.84	1.37	1.03

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues

8: Adams Street & Indiana Avenue

08/17/2018

								
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	113	502	42	234	21	617	380	891
v/c Ratio	0.62	0.77	0.42	0.47	0.25	0.46	0.83	0.40
Control Delay	66.1	54.0	68.1	29.6	63.1	31.7	55.3	11.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.7	57.6	0.7
Total Delay	66.1	54.0	68.1	29.6	63.1	32.4	112.9	12.1
Queue Length 50th (ft)	85	192	32	48	16	193	252	140
Queue Length 95th (ft)	145	248	70	88	44	286	270	200
Internal Link Dist (ft)	1051		991		2587		75	
Turn Bay Length (ft)	130	95		145		75		
Base Capacity (vph)	221	733	103	557	83	1344	590	2247
Starvation Cap Reductn	0	0	0	0	0	0	273	947
Spillback Cap Reductn	0	0	0	5	0	391	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.68	0.41	0.42	0.25	0.65	1.20	0.69
Intersection Summary								

Queues

9: Adams Street & Lincoln Avenue

08/17/2018

								
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	141	236	5	377	15	588	146	257
v/c Ratio	0.74	0.21	0.04	0.55	0.12	0.51	0.76	0.15
Control Delay	51.3	14.3	26.0	15.4	27.6	17.4	54.1	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.3	14.3	26.0	15.4	27.6	17.4	54.1	7.6
Queue Length 50th (ft)	46	26	2	35	5	79	48	15
Queue Length 95th (ft)	#110	50	9	55	18	114	#114	40
Internal Link Dist (ft)	1221		1308		1386		2587	
Turn Bay Length (ft)	120	140		150		200		
Base Capacity (vph)	191	1339	127	1242	127	1150	191	1666
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.18	0.04	0.30	0.12	0.51	0.76	0.15

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues

10: Jackson Street & Magnolia Avenue

08/17/2018

								
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	140	1156	89	761	98	604	127	432
v/c Ratio	0.69	0.89	0.76	0.75	0.67	0.68	0.86	0.42
Control Delay	47.9	30.7	72.5	24.3	54.4	23.5	81.1	17.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.9	30.7	72.5	24.3	54.4	23.5	81.1	17.0
Queue Length 50th (ft)	53	218	35	127	38	100	50	60
Queue Length 95th (ft)	#120	#314	#97	172	#97	134	#129	86
Internal Link Dist (ft)		940		1530		2241		2375
Turn Bay Length (ft)	170		110		150		125	
Base Capacity (vph)	205	1296	117	1113	147	1058	147	1083
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.89	0.76	0.68	0.67	0.57	0.86	0.40

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues

11: Overland Street & Magnolia Avenue

08/17/2018

						
Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	38	1259	104	736	32	207
v/c Ratio	0.08	0.54	0.48	0.31	0.08	0.45
Control Delay	5.2	6.6	17.3	5.1	14.6	16.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.2	6.6	17.3	5.1	14.6	16.7
Queue Length 50th (ft)	3	81	13	39	5	34
Queue Length 95th (ft)	15	170	#86	84	24	97
Internal Link Dist (ft)		1530		999	321	2410
Turn Bay Length (ft)	110		110			
Base Capacity (vph)	549	2800	262	2829	857	894
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.45	0.40	0.26	0.04	0.23

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues

12: Monroe Street & Magnolia Avenue

08/17/2018

									
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	112	1145	122	526	206	308	235	171	433
v/c Ratio	0.63	0.99	0.78	0.48	0.87	0.51	0.36	0.82	0.75
Control Delay	63.5	62.2	83.1	33.6	82.4	35.6	5.4	77.8	44.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.5	62.2	83.1	33.6	82.4	35.6	5.4	77.8	44.8
Queue Length 50th (ft)	80	440	90	161	151	186	0	124	284
Queue Length 95th (ft)	115	426	#141	184	#214	227	29	#172	327
Internal Link Dist (ft)		999		1167		2219			326
Turn Bay Length (ft)	105		115		150		150	150	
Base Capacity (vph)	227	1159	162	1093	244	603	656	221	574
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.99	0.75	0.48	0.84	0.51	0.36	0.77	0.75

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues

13: Campus View & Magnolia Avenue

09/05/2018



Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	994	101	604	39	19
v/c Ratio	0.76	0.48	0.33	0.06	0.03
Control Delay	27.5	43.1	12.0	19.2	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	27.5	43.1	12.0	19.2	8.9
Queue Length 50th (ft)	238	52	90	13	0
Queue Length 95th (ft)	338	102	122	37	15
Internal Link Dist (ft)	1167		1368	223	
Turn Bay Length (ft)		160		100	
Base Capacity (vph)	1390	476	2567	684	624
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.72	0.21	0.24	0.06	0.03
Intersection Summary					

Queues

14: Jefferson Street & Magnolia Avenue

08/17/2018

								
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	81	1107	79	859	124	249	130	296
v/c Ratio	0.52	0.85	0.63	0.69	0.79	0.58	0.83	0.68
Control Delay	42.5	26.7	55.5	20.0	67.5	23.3	73.2	25.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.5	26.7	55.5	20.0	67.5	23.3	73.2	25.6
Queue Length 50th (ft)	29	190	29	134	46	69	48	80
Queue Length 95th (ft)	#72	#253	#81	181	#119	111	#125	128
Internal Link Dist (ft)	2600		1278		1745		1836	
Turn Bay Length (ft)	110		110		140		140	
Base Capacity (vph)	156	1370	125	1307	156	589	156	593
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.81	0.63	0.66	0.79	0.42	0.83	0.50

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues

1: Adams Street & Garfield Street

08/17/2018

	→	←	↖	↑	↘	↓
Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	74	59	41	819	18	617
v/c Ratio	0.22	0.18	0.17	0.29	0.09	0.23
Control Delay	10.6	12.1	17.8	4.1	18.2	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.6	12.1	17.8	4.1	18.2	5.3
Queue Length 50th (ft)	4	4	5	0	2	0
Queue Length 95th (ft)	32	31	30	111	18	85
Internal Link Dist (ft)	1516	839		1277		1231
Turn Bay Length (ft)			50		50	
Base Capacity (vph)	926	980	240	2857	192	2705
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.06	0.17	0.29	0.09	0.23
Intersection Summary						

Queues

2: Adams Street & Magnolia Avenue

09/05/2018



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	161	1317	179	1063	463	486	198	178	538
v/c Ratio	0.70	0.96	0.97	0.84	1.02	0.66	0.38	0.75	0.75
Control Delay	57.5	45.3	106.4	38.7	90.5	41.1	7.0	63.6	42.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.5	45.3	106.4	38.7	90.5	41.1	7.0	63.6	42.2
Queue Length 50th (ft)	98	405	115	323	~156	152	0	110	161
Queue Length 95th (ft)	174	#625	#270	#527	#285	206	55	#227	219
Internal Link Dist (ft)		1368		2600		1492			1277
Turn Bay Length (ft)	180		135		145		245	105	
Base Capacity (vph)	286	1379	184	1258	456	1235	730	247	1216
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.96	0.97	0.84	1.02	0.39	0.27	0.72	0.44

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

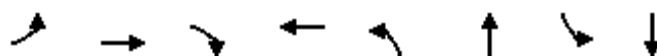
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Queues

3: Adams Street & Briarwood Drive

09/05/2018



Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	72	8	434	46	417	1039	9	976
v/c Ratio	0.19	0.01	0.60	0.10	0.74	0.52	0.10	0.63
Control Delay	32.3	29.4	8.1	23.0	58.6	8.2	51.0	26.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.3	29.4	8.1	23.0	58.6	8.2	51.0	26.5
Queue Length 50th (ft)	39	4	14	16	145	81	6	272
Queue Length 95th (ft)	78	17	101	46	m181	98	23	371
Internal Link Dist (ft)		97		247		351		1492
Turn Bay Length (ft)					250		48	
Base Capacity (vph)	412	596	749	468	728	1984	330	1548
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.01	0.58	0.10	0.57	0.52	0.03	0.63

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Queues

6: Adams Street & SR 91 WB Ramps

08/17/2018



Lane Group	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	409	383	337	931	1538
v/c Ratio	0.90	0.75	0.88	0.39	0.86dr
Control Delay	58.9	30.3	33.8	10.0	18.5
Queue Delay	0.1	0.0	55.5	51.1	0.9
Total Delay	59.0	30.3	89.3	61.2	19.4
Queue Length 50th (ft)	254	146	193	221	321
Queue Length 95th (ft)	#431	267	m170	m189	m290
Internal Link Dist (ft)	438			185	10
Turn Bay Length (ft)					
Base Capacity (vph)	486	542	420	2362	2006
Starvation Cap Reductn	0	0	134	1531	0
Spillback Cap Reductn	2	0	0	0	217
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.85	0.71	1.18	1.12	0.86

Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.
- dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Queues

7: Adams Street & SR 91 EB Ramps

08/17/2018

	→	↘	↑	↙	↓
Lane Group	EBT	EBR	NBT	SBL	SBT
Lane Group Flow (vph)	842	699	865	662	494
v/c Ratio	1.16	0.84	1.01	1.23	0.27
Control Delay	118.3	26.0	53.4	136.8	6.6
Queue Delay	1.3	16.5	34.2	0.0	1.1
Total Delay	119.6	42.6	87.6	136.8	7.7
Queue Length 50th (ft)	~705	257	~200	~585	25
Queue Length 95th (ft)	#944	#499	#198	m#778	m36
Internal Link Dist (ft)	522		75		185
Turn Bay Length (ft)					
Base Capacity (vph)	726	834	859	540	1833
Starvation Cap Reductn	0	0	199	2	1050
Spillback Cap Reductn	129	138	10	0	1033
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.41	1.00	1.31	1.23	0.63

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

Queues

8: Adams Street & Indiana Avenue

08/17/2018

								
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	194	429	38	442	43	613	300	934
v/c Ratio	0.72	0.47	0.40	0.77	0.40	0.50	0.74	0.49
Control Delay	59.3	34.2	62.5	36.8	61.1	32.5	49.4	19.8
Queue Delay	0.9	0.0	0.0	0.1	0.0	0.8	64.7	4.3
Total Delay	60.2	34.2	62.5	36.9	61.1	33.3	114.1	24.1
Queue Length 50th (ft)	131	134	26	95	30	189	175	243
Queue Length 95th (ft)	194	163	60	141	65	258	m245	323
Internal Link Dist (ft)		1051		991		2587		75
Turn Bay Length (ft)	130		95		145		75	
Base Capacity (vph)	337	1020	98	657	112	1214	466	1913
Starvation Cap Reductn	0	0	0	0	0	0	282	882
Spillback Cap Reductn	31	0	0	10	0	314	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.63	0.42	0.39	0.68	0.38	0.68	1.63	0.91

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Queues

9: Adams Street & Lincoln Avenue

08/17/2018

								
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	62	179	13	397	5	239	145	546
v/c Ratio	0.44	0.19	0.09	0.52	0.04	0.18	0.55	0.30
Control Delay	39.1	14.6	28.1	19.2	27.0	14.4	33.7	8.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.1	14.6	28.1	19.2	27.0	14.4	33.7	8.8
Queue Length 50th (ft)	21	20	4	55	2	30	47	43
Queue Length 95th (ft)	#60	42	18	80	10	53	#103	95
Internal Link Dist (ft)	1221		1308		1386		2587	
Turn Bay Length (ft)	120		140		150		200	
Base Capacity (vph)	140	1351	140	1322	140	1334	280	1825
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.13	0.09	0.30	0.04	0.18	0.52	0.30

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues

10: Jackson Street & Magnolia Avenue

08/17/2018

								
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	136	1458	74	1165	85	343	96	558
v/c Ratio	0.77	1.00	0.63	0.94	0.72	0.45	0.81	0.59
Control Delay	58.9	46.9	55.6	36.9	65.9	20.9	79.6	16.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.9	46.9	55.6	36.9	65.9	20.9	79.6	16.6
Queue Length 50th (ft)	49	~322	27	209	31	53	36	64
Queue Length 95th (ft)	#144	#500	#90	#383	#105	86	#118	108
Internal Link Dist (ft)		940		1530		2241		2375
Turn Bay Length (ft)	170		110		150		125	
Base Capacity (vph)	177	1455	118	1237	118	1060	118	1129
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.77	1.00	0.63	0.94	0.72	0.32	0.81	0.49

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues

11: Overland Street & Magnolia Avenue

08/17/2018

						
Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	33	1444	16	1188	31	31
v/c Ratio	0.08	0.44	0.05	0.36	0.07	0.07
Control Delay	2.0	1.8	1.9	1.5	11.8	9.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.0	1.8	1.9	1.5	11.8	9.7
Queue Length 50th (ft)	0	0	0	0	2	1
Queue Length 95th (ft)	9	126	5	93	24	21
Internal Link Dist (ft)		1530		999	321	2410
Turn Bay Length (ft)	110		110			
Base Capacity (vph)	401	3306	330	3313	1356	1285
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.44	0.05	0.36	0.02	0.02
Intersection Summary						

Queues

12: Monroe Street & Magnolia Avenue

08/17/2018

									
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	84	1404	192	1160	90	319	136	106	421
v/c Ratio	0.69	1.05	1.01	0.79	0.75	0.55	0.24	0.91	0.74
Control Delay	80.1	73.3	119.3	34.0	88.0	37.8	6.3	114.8	44.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	80.1	73.3	119.3	34.0	88.0	37.8	6.3	114.8	44.2
Queue Length 50th (ft)	62	~594	~146	385	67	197	1	79	274
Queue Length 95th (ft)	#130	#706	#288	457	#147	281	43	#183	382
Internal Link Dist (ft)		999		1167		2219			326
Turn Bay Length (ft)	105		115		150		150	150	
Base Capacity (vph)	127	1341	190	1473	121	578	568	117	570
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.66	1.05	1.01	0.79	0.74	0.55	0.24	0.91	0.74

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues

13: Campus View & Magnolia Avenue

09/05/2018



Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1326	69	1206	144	71
v/c Ratio	0.89	0.40	0.62	0.22	0.11
Control Delay	33.1	45.8	15.2	22.8	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	33.1	45.8	15.2	22.8	6.2
Queue Length 50th (ft)	363	38	227	59	0
Queue Length 95th (ft)	#541	80	287	111	29
Internal Link Dist (ft)	1167		1368	223	
Turn Bay Length (ft)		160		100	
Base Capacity (vph)	1550	330	2410	642	620
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.86	0.21	0.50	0.22	0.11

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues

14: Jefferson Street & Magnolia Avenue

08/17/2018

								
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	93	1044	61	1071	62	257	70	311
v/c Ratio	0.62	0.77	0.51	0.87	0.52	0.45	0.59	0.51
Control Delay	50.4	22.2	47.4	29.1	47.9	20.9	53.0	20.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.4	22.2	47.4	29.1	47.9	20.9	53.0	20.9
Queue Length 50th (ft)	37	192	24	205	25	78	28	97
Queue Length 95th (ft)	#103	#298	#73	#324	#74	142	#85	172
Internal Link Dist (ft)		2600		1278		1745		1836
Turn Bay Length (ft)	110		110		140		140	
Base Capacity (vph)	150	1460	119	1316	119	566	119	609
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.72	0.51	0.81	0.52	0.45	0.59	0.51

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		REC		Freeway/Dir of Travel		SR 91 Eastbound			
Agency or Company		Rick Engineering Company		Junction		Adams Street			
Date Performed		08/22/2018		Jurisdiction		Caltrans			
Analysis Time Period		AM Peak Hour		Analysis Year		Ex+Project			
Project Description California Baptist University									
Inputs									
Upstream Adj Ramp ☒ Yes ☒ On ☐ No ☐ Off $L_{up} =$ 2000 ft $V_u =$ 488 veh/h		Freeway Number of Lanes, N				4		Downstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{down} =$ ft $V_D =$ veh/h	
		Ramp Number of Lanes, N				2			
		Acceleration Lane Length, L_A							
		Deceleration Lane Length L_D				0			
		Freeway Volume, V_F				5169			
		Ramp Volume, V_R				1225			
Freeway Free-Flow Speed, S_{FF}				65.0					
Ramp Free-Flow Speed, S_{FR}				35.0					
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	5169	0.90	Level	2	1	0.988	1.00	5812	
Ramp	1225	0.90	Level	2	1	0.988	1.00	1377	
UpStream	488	0.90	Level	2	1	0.988	1.00	549	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$ $L_{EQ} =$ (Equation 13-6 or 13-7) $P_{FM} =$ using Equation (Exhibit 13-6) $V_{12} =$ pc/h V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☐ Yes ☐ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ $L_{EQ} =$ (Equation 13-12 or 13-13) $P_{FD} =$ 0.260 using Equation (Exhibit 13-7) $V_{12} =$ 2530 pc/h V_3 or V_{av34} 1641 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☐ Yes ☒ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8			V_F	5812	Exhibit 13-8	9400	No
			$V_{FO} = V_F - V_R$	4435	Exhibit 13-8	9400	No		
			V_R	1377	Exhibit 13-10	4000	No		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8			V_{12}	2530	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ (pc/mi/ln) $LOS =$ (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ 12.5 (pc/mi/ln) $LOS =$ B (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ (Exhibit 13-11) $S_R =$ mph (Exhibit 13-11) $S_0 =$ mph (Exhibit 13-11) $S =$ mph (Exhibit 13-13)					$D_S =$ 0.552 (Exhibit 13-12) $S_R =$ 52.3 mph (Exhibit 13-12) $S_0 =$ 68.8 mph (Exhibit 13-12) $S =$ 60.5 mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		REC		Freeway/Dir of Travel		SR 91 Eastbound			
Agency or Company		Rick Engineering Company		Junction		Adams Street			
Date Performed		08/22/2018		Jurisdiction		Caltrans			
Analysis Time Period		AM Peak Hour		Analysis Year		Ex+Project			
Project Description California Baptist University									
Inputs									
Upstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{up} =$ ft $V_u =$ veh/h		Freeway Number of Lanes, N				3		Downstream Adj Ramp ☒ Yes ☐ On ☐ No ☒ Off $L_{down} =$ 2000 ft $V_D =$ 1104 veh/h	
		Ramp Number of Lanes, N				1			
		Acceleration Lane Length, L_A				700			
		Deceleration Lane Length L_D							
		Freeway Volume, V_F				5169			
		Ramp Volume, V_R				510			
Freeway Free-Flow Speed, S_{FF}				65.0					
Ramp Free-Flow Speed, S_{FR}				35.0					
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	5169	0.90	Level	2	1	0.988	1.00	5812	
Ramp	510	0.90	Level	2	1	0.988	1.00	573	
UpStream									
DownStream	1104	0.90	Level	2	1	0.988	1.00	1241	
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$ $L_{EQ} =$ 6726.29 (Equation 13-6 or 13-7) $P_{FM} =$ 0.712 using Equation (Exhibit 13-6) $V_{12} =$ 4137 pc/h V_3 or V_{av34} 1675 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☒ Yes ☐ No If Yes, $V_{12a} =$ 4137 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ $L_{EQ} =$ (Equation 13-12 or 13-13) $P_{FD} =$ using Equation (Exhibit 13-7) $V_{12} =$ pc/h V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☐ Yes ☐ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}	6385	Exhibit 13-8		No	V_F		Exhibit 13-8		
					$V_{FO} = V_F - V_R$		Exhibit 13-8		
					V_R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V_{R12}	4710	Exhibit 13-8	4600:All	Yes	V_{12}		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ 37.6 (pc/mi/ln) LOS = E (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ 0.705 (Exhibit 13-11) $S_R =$ 48.8 mph (Exhibit 13-11) $S_0 =$ 60.8 mph (Exhibit 13-11) $S =$ 51.4 mph (Exhibit 13-13)					$D_s =$ (Exhibit 13-12) $S_R =$ mph (Exhibit 13-12) $S_0 =$ mph (Exhibit 13-12) $S =$ mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		REC		Freeway/Dir of Travel		SR 91 Eastbound			
Agency or Company		Rick Engineering Company		Junction		Adams Street			
Date Performed		08/22/2018		Jurisdiction		Caltrans			
Analysis Time Period		PM Peak Hour		Analysis Year		Ex+Project			
Project Description California Baptist University									
Inputs									
Upstream Adj Ramp ☒ Yes ☒ On ☐ No ☐ Off $L_{up} =$ 2000 ft $V_u =$ 885 veh/h		Freeway Number of Lanes, N				4		Downstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{down} =$ ft $V_D =$ veh/h	
		Ramp Number of Lanes, N				2			
		Acceleration Lane Length, L_A							
		Deceleration Lane Length L_D				0			
		Freeway Volume, V_F				4884			
		Ramp Volume, V_R				1433			
Freeway Free-Flow Speed, S_{FF}				65.0					
Ramp Free-Flow Speed, S_{FR}				35.0					
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	4884	0.90	Level	2	1	0.988	1.00	5492	
Ramp	1433	0.90	Level	2	1	0.988	1.00	1611	
UpStream	885	0.90	Level	2	1	0.988	1.00	995	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$ $L_{EQ} =$ (Equation 13-6 or 13-7) $P_{FM} =$ using Equation (Exhibit 13-6) $V_{12} =$ pc/h V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☐ Yes ☐ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ $L_{EQ} =$ (Equation 13-12 or 13-13) $P_{FD} =$ 0.260 using Equation (Exhibit 13-7) $V_{12} =$ 2620 pc/h V_3 or V_{av34} 1436 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☐ Yes ☒ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8			V_F	5492	Exhibit 13-8	9400	No
			$V_{FO} = V_F - V_R$	3881	Exhibit 13-8	9400	No		
			V_R	1611	Exhibit 13-10	4000	No		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8			V_{12}	2620	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ 13.3 (pc/mi/ln) LOS = B (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ (Exhibit 13-11) $S_R =$ mph (Exhibit 13-11) $S_0 =$ mph (Exhibit 13-11) $S =$ mph (Exhibit 13-13)					$D_S =$ 0.573 (Exhibit 13-12) $S_R =$ 51.8 mph (Exhibit 13-12) $S_0 =$ 69.6 mph (Exhibit 13-12) $S =$ 59.8 mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		REC		Freeway/Dir of Travel		SR 91 Eastbound			
Agency or Company		Rick Engineering Company		Junction		Adams Street			
Date Performed		08/22/2018		Jurisdiction		Caltrans			
Analysis Time Period		PM Peak Hour		Analysis Year		Ex+Project			
Project Description California Baptist University									
Inputs									
Upstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{up} =$ ft $V_u =$ veh/h		Freeway Number of Lanes, N 3				Downstream Adj Ramp ☒ Yes ☐ On ☐ No ☒ Off $L_{down} =$ 2000 ft $V_D =$ 1360 veh/h			
		Ramp Number of Lanes, N 1							
		Acceleration Lane Length, L_A 700							
		Deceleration Lane Length L_D							
		Freeway Volume, V_F 4884							
		Ramp Volume, V_R 970							
Freeway Free-Flow Speed, S_{FF} 65.0				Ramp Free-Flow Speed, S_{FR} 35.0					
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	4884	0.90	Level	2	1	0.988	1.00	5492	
Ramp	970	0.90	Level	2	1	0.988	1.00	1091	
UpStream									
DownStream	1360	0.90	Level	2	1	0.988	1.00	1529	
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$ $L_{EQ} =$ 8287.26 (Equation 13-6 or 13-7) $P_{FM} =$ 0.750 using Equation (Exhibit 13-6) $V_{12} =$ 4117 pc/h V_3 or V_{av34} 1375 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☒ Yes ☐ No If Yes, $V_{12a} =$ 4117 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ $L_{EQ} =$ (Equation 13-12 or 13-13) $P_{FD} =$ using Equation (Exhibit 13-7) $V_{12} =$ pc/h V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☐ Yes ☐ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}	6583	Exhibit 13-8		No	V_F		Exhibit 13-8		
					$V_{FO} = V_F - V_R$		Exhibit 13-8		
					V_R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V_{R12}	5208	Exhibit 13-8	4600:All	Yes	V_{12}		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ 41.2 (pc/mi/ln) LOS = E (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ 0.985 (Exhibit 13-11) $S_R =$ 42.4 mph (Exhibit 13-11) $S_0 =$ 61.8 mph (Exhibit 13-11) $S =$ 45.3 mph (Exhibit 13-13)					$D_s =$ (Exhibit 13-12) $S_R =$ mph (Exhibit 13-12) $S_0 =$ mph (Exhibit 13-12) $S =$ mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		REC		Freeway/Dir of Travel		SR 91 Westbound			
Agency or Company		Rick Engineering Company		Junction		Adams Street			
Date Performed		08/22/2018		Jurisdiction		Caltrans			
Analysis Time Period		AM Peak Hour		Analysis Year		Ex+Project			
Project Description California Baptist University									
Inputs									
Upstream Adj Ramp ☒ Yes ☒ On ☐ No ☐ Off $L_{up} =$ 2400 ft $V_u =$ 625 veh/h		Freeway Number of Lanes, N				4		Downstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{down} =$ ft $V_D =$ veh/h	
		Ramp Number of Lanes, N				2			
		Acceleration Lane Length, L_A							
		Deceleration Lane Length L_D				0			
		Freeway Volume, V_F				5729			
		Ramp Volume, V_R				1095			
Freeway Free-Flow Speed, S_{FF}				65.0					
Ramp Free-Flow Speed, S_{FR}				35.0					
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	5729	0.90	Level	2	1	0.988	1.00	6442	
Ramp	1095	0.90	Level	2	1	0.988	1.00	1231	
UpStream	625	0.90	Level	2	1	0.988	1.00	703	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$ $L_{EQ} =$ (Equation 13-6 or 13-7) $P_{FM} =$ using Equation (Exhibit 13-6) $V_{12} =$ pc/h V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☐ Yes ☐ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ $L_{EQ} =$ (Equation 13-12 or 13-13) $P_{FD} =$ 0.260 using Equation (Exhibit 13-7) $V_{12} =$ 2586 pc/h V_3 or V_{av34} 1928 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☐ Yes ☒ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8			V_F	6442	Exhibit 13-8	9400	No
			$V_{FO} = V_F - V_R$	5211	Exhibit 13-8	9400	No		
			V_R	1231	Exhibit 13-10	4000	No		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8			V_{12}	2586	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ (pc/mi/ln) $LOS =$ (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ 13.0 (pc/mi/ln) $LOS =$ B (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ (Exhibit 13-11) $S_R =$ mph (Exhibit 13-11) $S_0 =$ mph (Exhibit 13-11) $S =$ mph (Exhibit 13-13)					$D_S =$ 0.539 (Exhibit 13-12) $S_R =$ 52.6 mph (Exhibit 13-12) $S_0 =$ 67.7 mph (Exhibit 13-12) $S =$ 60.7 mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		REC		Freeway/Dir of Travel		SR 91 Westbound			
Agency or Company		Rick Engineering Company		Junction		Adams Street			
Date Performed		08/22/2018		Jurisdiction		Caltrans			
Analysis Time Period		AM Peak Hour		Analysis Year		Ex+Project			
Project Description California Baptist University									
Inputs									
Upstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{up} =$ ft $V_u =$ veh/h		Freeway Number of Lanes, N 4				Downstream Adj Ramp ☒ Yes ☒ On ☐ No ☐ Off $L_{down} =$ 2400 ft $V_D =$ 994 veh/h			
		Ramp Number of Lanes, N 1							
		Acceleration Lane Length, L_A 1500							
		Deceleration Lane Length L_D							
		Freeway Volume, V_F 5729							
		Ramp Volume, V_R 644							
Freeway Free-Flow Speed, S_{FF} 65.0									
Ramp Free-Flow Speed, S_{FR} 35.0									
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	5729	0.90	Level	2	1	0.988	1.00	6442	
Ramp	644	0.90	Level	2	1	0.988	1.00	724	
UpStream									
DownStream	994	0.90	Level	2	1	0.988	1.00	1118	
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$ $L_{EQ} =$ (Equation 13-6 or 13-7) $P_{FM} =$ 0.127 using Equation (Exhibit 13-6) $V_{12} =$ 820 pc/h V_3 or V_{av34} 2811 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☒ Yes ☐ No Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☒ Yes ☐ No If Yes, $V_{12a} =$ 2576 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ $L_{EQ} =$ (Equation 13-12 or 13-13) $P_{FD} =$ using Equation (Exhibit 13-7) $V_{12} =$ pc/h V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☐ Yes ☐ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}	7166	Exhibit 13-8		No	V_F		Exhibit 13-8		
					$V_{FO} = V_F - V_R$		Exhibit 13-8		
					V_R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V_{R12}	3300	Exhibit 13-8	4600:All	No	V_{12}		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ 21.5 (pc/mi/ln) LOS = C (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ 0.322 (Exhibit 13-11) $S_R =$ 57.6 mph (Exhibit 13-11) $S_0 =$ 59.8 mph (Exhibit 13-11) $S =$ 58.8 mph (Exhibit 13-13)					$D_s =$ (Exhibit 13-12) $S_R =$ mph (Exhibit 13-12) $S_0 =$ mph (Exhibit 13-12) $S =$ mph (Exhibit 13-13)				

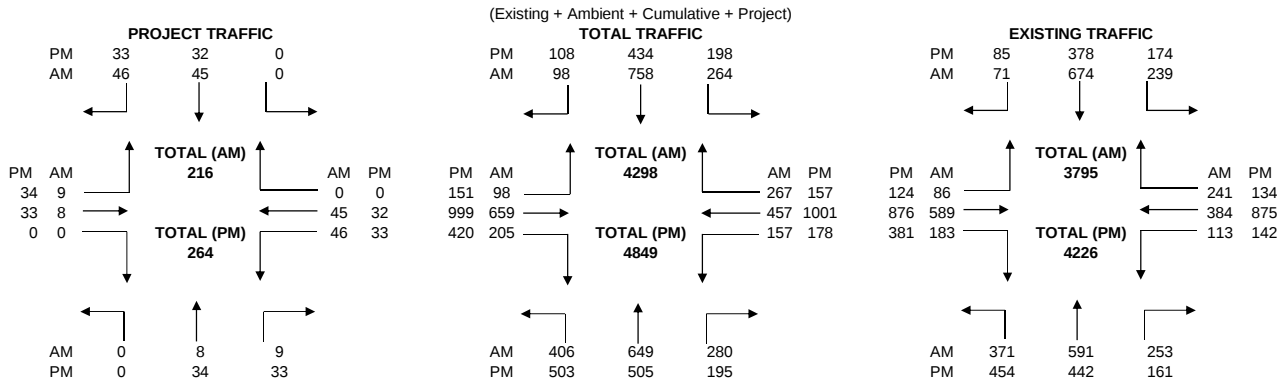
RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		REC		Freeway/Dir of Travel		SR 91 Westbound			
Agency or Company		Rick Engineering Company		Junction		Adams Street			
Date Performed		08/22/2018		Jurisdiction		Caltrans			
Analysis Time Period		AM Peak Hour		Analysis Year		Ex+Project			
Project Description California Baptist University									
Inputs									
Upstream Adj Ramp ☒ Yes ☒ On ☐ No ☐ Off L _{up} = 2400 ft V _u = 877 veh/h		Freeway Number of Lanes, N				4		Downstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off L _{down} = ft V _D = veh/h	
		Ramp Number of Lanes, N				2			
		Acceleration Lane Length, L _A							
		Deceleration Lane Length L _D				0			
		Freeway Volume, V _F				5547			
		Ramp Volume, V _R				769			
Freeway Free-Flow Speed, S _{FF}				65.0					
Ramp Free-Flow Speed, S _{FR}				35.0					
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF × f _{HV} × f _p	
Freeway	5547	0.90	Level	2	1	0.988	1.00	6237	
Ramp	769	0.90	Level	2	1	0.988	1.00	865	
UpStream	877	0.90	Level	2	1	0.988	1.00	986	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v₁₂					Estimation of v₁₂				
V ₁₂ = V _F (P _{FM}) L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? ☐ Yes ☐ No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 ☐ Yes ☐ No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					V ₁₂ = V _R + (V _F - V _R)P _{FD} L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.260 using Equation (Exhibit 13-7) V ₁₂ = 2262 pc/h V ₃ or V _{av34} = 1987 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? ☐ Yes ☒ No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 ☒ Yes ☐ No If Yes, V _{12a} = 2494 pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	6237	Exhibit 13-8	9400	No
			V _{FO} = V _F - V _R	5372	Exhibit 13-8	9400	No		
			V _R	865	Exhibit 13-10	4000	No		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}		Exhibit 13-8			V ₁₂	2262	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
D _R = 5.475 + 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					D _R = 4.252 + 0.0086 V ₁₂ - 0.009 L _D D _R = 12.2 (pc/mi/ln) LOS = B (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = (Exhibit 13-11) S _R = mph (Exhibit 13-11) S ₀ = mph (Exhibit 13-11) S = mph (Exhibit 13-13)					D _S = 0.506 (Exhibit 13-12) S _R = 53.4 mph (Exhibit 13-12) S ₀ = 67.9 mph (Exhibit 13-12) S = 61.2 mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		REC		Freeway/Dir of Travel		SR 91 Westbound			
Agency or Company		Rick Engineering Company		Junction		Adams Street			
Date Performed		08/22/2018		Jurisdiction		Caltrans			
Analysis Time Period		PM Peak Hour		Analysis Year		Ex+Project			
Project Description California Baptist University									
Inputs									
Upstream Adj Ramp ☐ Yes ☐ On ☒ No ☐ Off $L_{up} =$ ft $V_u =$ veh/h		Freeway Number of Lanes, N 4				Downstream Adj Ramp ☒ Yes ☒ On ☐ No ☐ Off $L_{down} =$ 2400 ft $V_D =$ 697 veh/h			
		Ramp Number of Lanes, N 1							
		Acceleration Lane Length, L_A 1500							
		Deceleration Lane Length L_D							
		Freeway Volume, V_F 5547							
		Ramp Volume, V_R 953							
Freeway Free-Flow Speed, S_{FF} 65.0									
Ramp Free-Flow Speed, S_{FR} 35.0									
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	5547	0.90	Level	2	1	0.988	1.00	6237	
Ramp	953	0.90	Level	2	1	0.988	1.00	1072	
UpStream									
DownStream	697	0.90	Level	2	1	0.988	1.00	784	
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$ $L_{EQ} =$ (Equation 13-6 or 13-7) $P_{FM} =$ 0.084 using Equation (Exhibit 13-6) $V_{12} =$ 523 pc/h V_3 or V_{av34} 2857 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☒ Yes ☐ No Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☒ Yes ☐ No If Yes, $V_{12a} =$ 2494 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ $L_{EQ} =$ (Equation 13-12 or 13-13) $P_{FD} =$ using Equation (Exhibit 13-7) $V_{12} =$ pc/h V_3 or V_{av34} pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☐ Yes ☐ No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}	7309	Exhibit 13-8		No	V_F		Exhibit 13-8		
					$V_{FO} = V_F - V_R$		Exhibit 13-8		
					V_R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V_{R12}	3566	Exhibit 13-8	4600:All	No	V_{12}		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ 23.4 (pc/mi/ln) LOS = C (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ 0.354 (Exhibit 13-11) $S_R =$ 56.9 mph (Exhibit 13-11) $S_0 =$ 60.1 mph (Exhibit 13-11) $S =$ 58.5 mph (Exhibit 13-13)					$D_s =$ (Exhibit 13-12) $S_R =$ mph (Exhibit 13-12) $S_0 =$ mph (Exhibit 13-12) $S =$ mph (Exhibit 13-13)				

APPENDIX L

Fair-Share Calculations

FAIR SHARE CALCULATIONS
Adams Street/Magnolia Avenue



FAIR SHARE CALC = (PROJECT VOLUMES) / (TOTAL VOLUMES - EXISTING VOLUMES)

AM FAIR SHARE = 42.94%

PM FAIR SHARE = 42.38%

Fair Share - General Plan Buildout Conditions

$$\text{Fair Share} = \frac{\text{Project Trips}}{\text{GP B/O Trips} - \text{Existing Trips}}$$

	<u>Am</u>	<u>Pm</u>	<u>Use</u>
Adams/Magnolia →	$\frac{216}{5,520 - 3,795} = 12.52\%$	$\frac{264}{6,160 - 4,226} = 13.65\%$	13.65%
Jackson/Magnolia →	$\frac{108}{4,340 - 2,720} = 6.67\%$	$\frac{132}{5,760 - 3,430} = 5.67\%$	6.67%
Monroe/Magnolia →	$\frac{216}{3,470 - 2,302} = 18.49\%$	$\frac{264}{5,050 - 3,178} = 14.10\%$	18.49%
Jefferson/Magnolia →	$\frac{108}{3,240 - 2,230} = 10.69\%$	$\frac{131}{3,850 - 2,660} = 11.01\%$	11.01%
Garfield/Adams →	$\frac{108}{3,270 - 2,058} = 8.91\%$	$\frac{133}{2,380 - 1,463} = 14.50\%$	14.50%

Note: The fair share calculations were based on General Plan Buildout Conditions as this scenario represents a 'worst case' scenario.

APPENDIX M

Queuing Exhibits



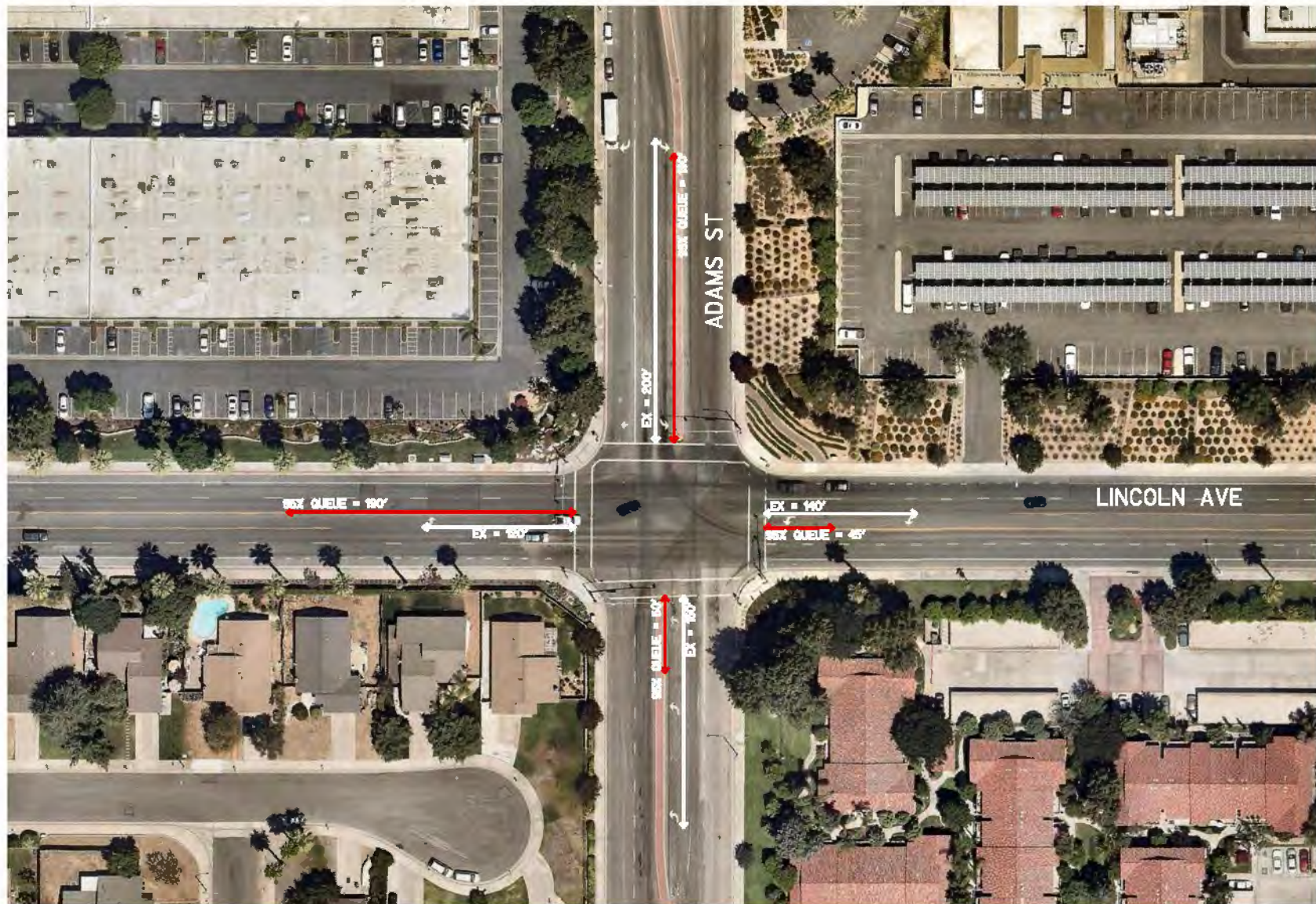
ANTICIPATED QUEUEING CAN BE ACCOMMODATED BY MINOR RESTRIPIPING.



NO SCALE

EXHIBIT M1

QUEUEING - ADAMS STREET AND GARFIELD STREET
BUILD OUT W/ PROJECT
CALIFORNIA BAPTIST UNIVERSITY TRAFFIC ANALYSIS



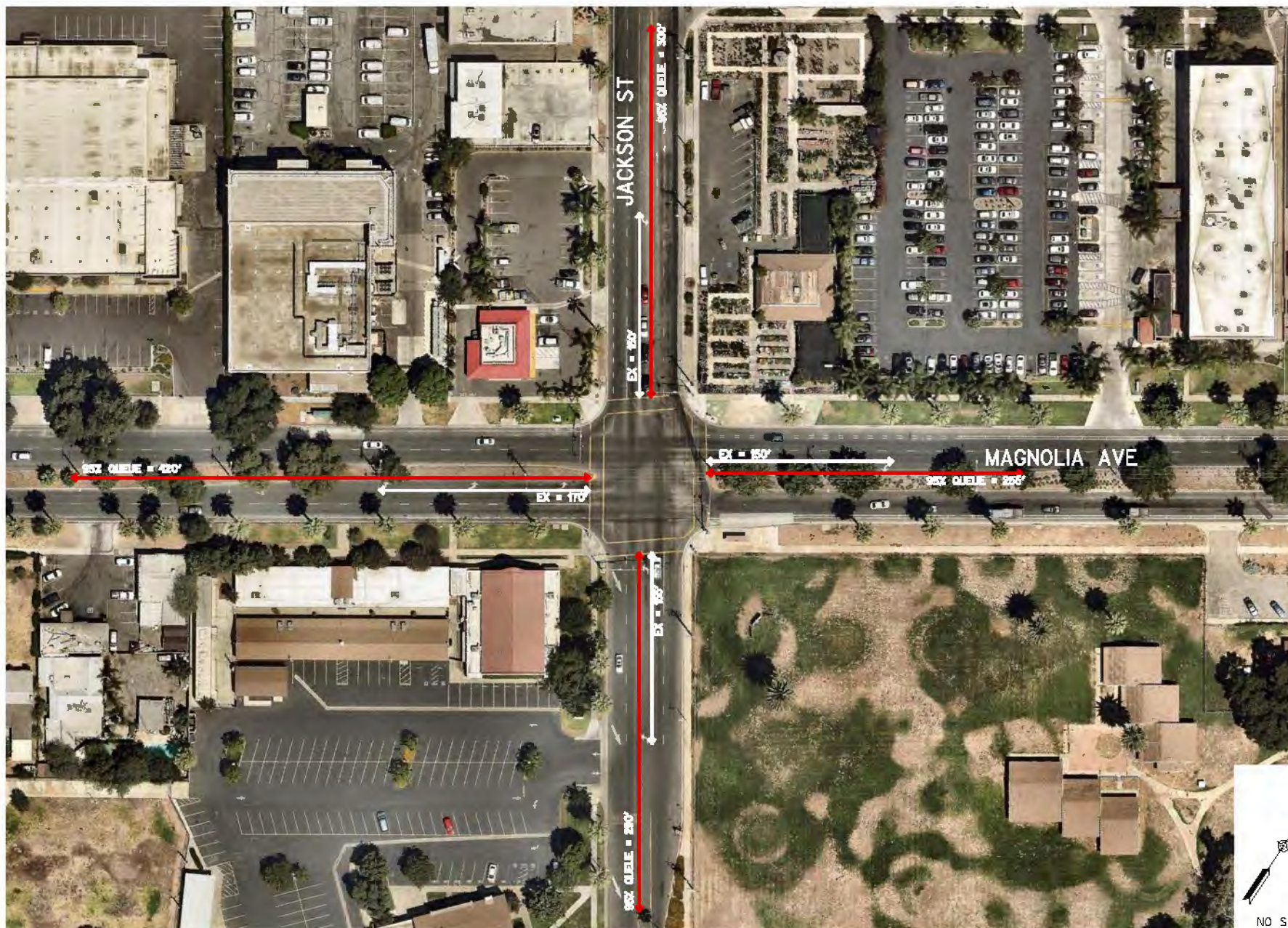
ANTICIPATED QUEUING CAN BE ACCOMMODATED WITHIN EXISTING TWLTL



NO SCALE

EXHIBIT M3

QUEUING - ADAMS STREET AND LINCOLN STREET
BUILD OUT W/ PROJECT
CALIFORNIA BAPTIST UNIVERSITY TRAFFIC ANALYSIS



RICK
ENGINEERING COMPANY

EXHIBIT M4

QUEUING - MAGNOLIA AVENUE AND JACKSON STREET
BUILD OUT W/ PROJECT
CALIFORNIA BAPTIST UNIVERSITY TRAFFIC ANALYSIS

ANTICIPATED QUEUING ALONG MAGNOLIA MAY EXTEND PAST RAISED MEDIAN DURING PEAK HOUR.

ANTICIPATED QUEUING ALONG JACKSON CAN BE ACCOMMODATED WITHIN EXISTING TWLTL.



ANTICIPATED QUEUING IN WB IS NEGLIGIBLE (150' AVAILABLE STORAGE, 160' ANTICIPATED QUEUE).



NO SCALE

EXHIBIT M5

QUEUING - MAGNOLIA AVENUE AND OVERLAND STREET
BUILD OUT W/ PROJECT
CALIFORNIA BAPTIST UNIVERSITY TRAFFIC ANALYSIS

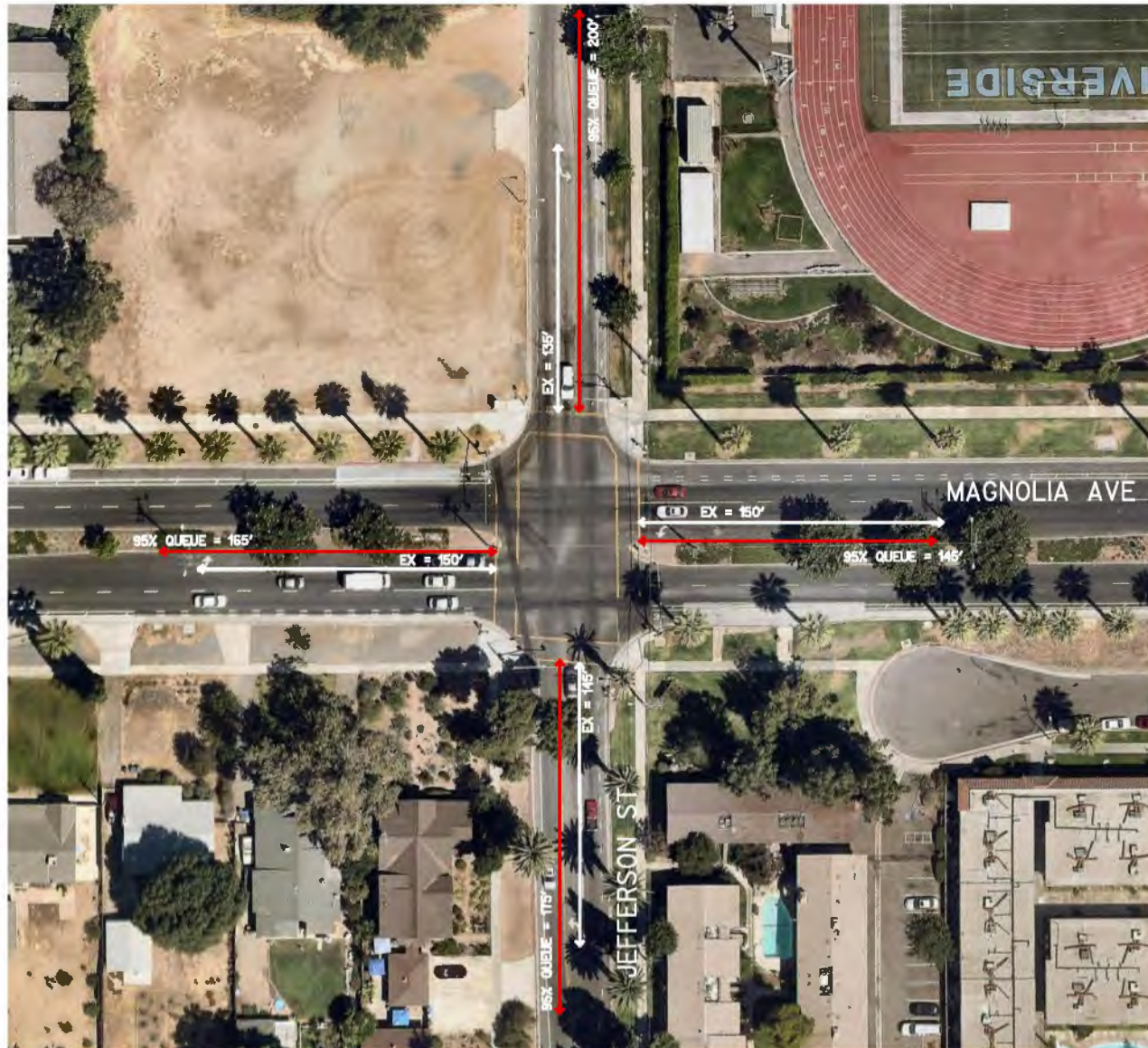


ANTICIPATED QUEUING ALONG MONROE CAN BE ACCOMODATED WITHIN EXISTING TWLTL.
 ANTICIPATED QUEUING ALONG MAGNOLIA MAY EXTEND PAST RAISED MEDIAN DURING PEAK HOUR.

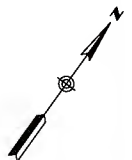
RICK
 ENGINEERING COMPANY

EXHIBIT M6

QUEUING - MAGNOLIA AVENUE AND MONROE STREET
 BUILD OUT W/ PROJECT
 CALIFORNIA BAPTIST UNIVERSITY TRAFFIC ANALYSIS



ANTICIPATED QUEUING ALONG MAGNOLIA IS NEGLIGIBLE (150' AVAILABLE STORAGE IN EASTBOUND DIRECTION, 165' ANTICIPATED QUEUE).
 ANTICIPATED QUEUING ALONG JEFFERSON MAY EXTEND PAST AVAILABLE STORAGE.



NO SCALE

EXHIBIT M7

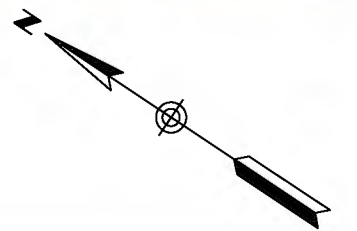
QUEUING - MAGNOLIA AVENUE AND JEFFERSON AVENUE
 BUILDOUT W/ PROJECT
 CALIFORNIA BAPTIST UNIVERSITY TRAFFIC ANALYSIS

APPENDIX N

Adams Street Widening Feasibility Exhibit



- CLASSIFIED AS A 4-LANE ARTERIAL (110' ROW, 86' CURB TO CURB)
- TO GET 6-LANE ARTERIAL (120' ROW, 100' CURB TO CURB), THERE WOULD BE SIGNIFICANT IMPACTS TO EXISTING SINGLE FAMILY HOMES AS WELL AS TO THE MAGNOLIA AVENUE BAPTIST CHURCH.



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