VOLUME IV

DRAFT EIR APPENDIX H

APPENDIX H

TRAFFIC TECHNICAL REPORT

TRAFFIC IMPACT STUDY

SAN JOAQUIN COUNTY COURT BUILDING IN STOCKTON, CA TRAFFIC STUDY ADDENDUM

NEAR TERM HORIZON (YEAR 2013) REVISED TRAFFIC ANALYSIS

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

APPENDIX

I. INTRODUCTION

This report has been prepared at the request of the AOC to detail the near term horizon (year 2013) off-site traffic impacts and needed mitigations to be associated with the proposed new Stockton Courthouse for the Superior Court of California, County of San Joaquin in downtown Stockton. Evaluation has been conducted for the proposed site near the Weber Street/Hunter Square intersection (Hunter Square site) as well as for an alternative site at the Washington Street/Madison Street intersection (Washington Street site) – see **Figure 1**. Year 2013 analysis and findings from this Traffic Study Addendum replace those previously developed in the September 2008 San Joaquin County Court Traffic Study by PHA Transportation Consultants.

II. SUMMARY OF SIGNIFICANT IMPACTS AND NEEDED MITIGATIONS

A. PROJECT YEAR 2013 SIGNIFICANT IMPACTS – HUNTER SQUARE COURTHOUSE SITE

IMPACT 1: 95TH PERCENTILE VEHICLE QUEUING

Northbound El Dorado Street Approach to Washington Street – AM Peak Hour
The proposed project would increase AM peak hour volumes by 12 percent (from 1,700 up to 1,905 vehicles) on this intersection approach, where year 2013 Base Case volumes would already have 95th percentile queues exceeding available storage.

MITIGATION 1:

There are no physical improvements nor feasible signal timing improvements available to reduce Base Case + Project 95th percentile queues on the northbound intersection approach to Base Case conditions.

This impact would remain significant and unavoidable.

B. PROJECT YEAR 2013 SIGNIFICANT IMPACTS – WASHINGTON STREET SITE

IMPACT 1A: 95TH PERCENTILE VEHICLE QUEUING

Northbound El Dorado Street Approach to Washington Street – AM Peak Hour
The proposed project would increase AM peak hour volumes by 6 percent (from 1,700 up to 1,796 vehicles) on this intersection approach, where year 2013 Base Case volumes would already have 95th percentile queues exceeding available storage.

MITIGATION 1A:

There are no physical improvements nor feasible signal timing improvements available to reduce Base Case + Project 95th percentile queues on the northbound intersection approach to Base Case conditions.

This impact would remain significant and unavoidable.

IMPACT 2: PEDESTRIAN (STUDENT) CROSSINGS AT UNSIGNALIZED INTERSECTIONS NEAR THE PROJECT SITE

The addition of project traffic to East Weber Street, South Madison Street, Washington Street and Market Street will increase safety concerns at unsignalized intersections for students walking to the nearby high school (Weber Institute). This is a particular concern for students crossing Weber Street due to its width.

MITIGATION 2:

Safety measures shall be installed at intersections near the project site to facilitate safe student crossings. Locations and measures will be selected by the school district and City of Stockton Public Works Department.

III. REVISED ANALYSIS – ADJUSTMENTS TO INPUT AND ASSUMPTIONS

The following input data have been adjusted for the revised year 2013 analysis.

- ***Net New Courthouse Development:*** The new courthouse will have 285,000 square feet of space and 17,000 square feet of ground level parking for judges and administrative officers. In conjunction with development of the new courthouse, a ± 50,000-square-foot wing of the existing (adjacent) courthouse will be demolished, rather than be utilized for office space. Thus, the net change in court-related office space in downtown Stockton will be 235,000 square feet (285,000 SQ.FT. – 50,000 SQ.FT.), not the 285,000 square feet previously used for analysis purposes.

- ***New Stockton City Hall:*** Stockton is currently consolidating City Hall functions from many facilities in downtown Stockton to the Washington Mutual (Wa Mu) Building bounded by Market, Main, Sutter and California streets. Facilities currently used by the City will then, for the most part, be utilized as office space for other businesses. As a result, City employees will be occupying space formerly utilized by other workers in the Wa Mu building, while space formerly occupied by City workers will be utilized by staff associated with businesses moving into the old City offices. The net result will be no significant change in traffic in the downtown area. Therefore, this study projects no change in traffic activity in downtown Stockton due to the new City Hall, unlike the previous study which conservatively assumed an entirely new work force in downtown Stockton.

- ***Assignment of New Courthouse Traffic to Local Street System:*** Net new traffic due to the proposed Hunter Square courthouse has been assigned to the two major garages in the downtown area that would most likely be used by staff and jurors. Specifically, the Stewart-Eberhardt Garage south of Weber Street and accessed via both El Dorado Street and Center Street would be utilized by ± 85 percent of the jurors and 15 percent of the staff, while the Coy Garage south of Channel Street and accessed via Hunter Street would be utilized by 15 percent of the jurors and 85 percent of the staff. In the previous study, all courthouse traffic was assigned to the block of the new courthouse. For analysis of the alternative courthouse site along Washington Street, all parking would be within surface lots just west and north of the courthouse building or along nearby streets.

IV. STUDY METHODOLOGY

A. ANALYSIS INTERSECTIONS

This study has evaluated operating conditions at 15 intersections providing access to the Hunter Square site and 12 intersections providing access to the alternative Washington Street site. Locations evaluated are as follows.

1. Hunter Square Site Intersections

1. Center Street/Park Street
2. El Dorado Street/Park Street
3. Center Street/Oak Street
4. El Dorado Street/Oak Street
5. Center Street/Fremont Street
6. El Dorado Street/Fremont Street
7. Center Street/Weber Street
8. El Dorado Street/Weber Street
9. Weber Street/California Street
10. Center Street/Washington Street – Westbound S.R.4 On-Ramp
11. El Dorado Street/Washington Street – Westbound S.R.4 Off-Ramp
12. Stanislaus Street/Washington Street – Westbound S.R.4 Off-Ramp
13. Center Street/Lafayette Street – Eastbound S.R.4 Off-Ramp
14. El Dorado Street/Lafayette Street – Eastbound S.R.4 On-Ramp
15. Stanislaus Street/Lafayette Street – Eastbound S.R.4 On-Ramp

2. Washington Street Alternative Site Intersections

1. Van Buren Street/Weber Street
2. Madison Street/Weber Street
3. Madison Street/Market Street
4. Madison Street/Washington Street
5. Lincoln Street/Washington Street
6. Madison Street/Lafayette Street
7. Center Street/Washington Street – Westbound S.R.4 On-Ramp
8. El Dorado Street/Washington Street – Westbound S.R.4 Off-Ramp

9. Center Street/Lafayette Street – Eastbound S.R.4 Off-Ramp
10. El Dorado Street/Lafayette Street – Eastbound S.R.4 On-Ramp
11. Center Street/Weber Street
12. El Dorado Street/Weber Street

B. SCENARIOS EVALUATED

Year 2013 is the projected year of project completion with full courthouse occupancy and operation. Scenarios evaluated were:

- Base Case (without Project)
- Base Case + New Courthouse

C. OPERATING CONDITIONS EVALUATED

The following conditions have been evaluated at each intersection

- Level of service and control delay
- Peak hour signal warrants at all unsignalized locations
- 95th percentile vehicle queuing on select approaches to each signalized intersection

D. INTERSECTION ANALYSIS METHODOLOGY

Transportation engineers and planners commonly use a grading system called level of service (LOS) to measure and describe the operational status of the local roadway network. LOS is a description of the quality of a roadway facility's operation, ranging from LOS A (indicating free-flow traffic conditions with little or no delay) to LOS F (representing oversaturated conditions where traffic flows exceed design capacity, resulting in long queues and delays). Intersections, rather than roadway segments between intersections, are almost always the capacity controlling locations for any circulation system.

Signalized Intersections. For signalized intersections, the 2000 *Highway Capacity Manual* (Transportation Research Board, National Research Council) methodology was utilized. With this methodology, operations are defined by the level of service and average control delay per vehicle (measured in seconds) for the entire intersection. For a signalized intersection, control delay is the portion of the total delay attributed to traffic signal operation. This includes delay associated with deceleration, acceleration, stopping, and moving up in the queue. **Table 1** summarizes the relationship between delay and LOS for signalized intersections.

Unsignalized Intersections. For unsignalized (all-way stop-controlled and side-street stop-controlled) intersections, the 2000 Highway Capacity Manual (Transportation Research Board, National Research Council) methodology for unsignalized intersections was utilized. For side-street stop-controlled intersections, operations are defined by the level of service and average control delay per vehicle (measured in seconds), with delay typically represented for the stop sign controlled approaches or turn movements. For all-way stop-controlled intersections, operations are defined by the average control delay for the entire intersection (measured in seconds per vehicle). The delay at an unsignalized intersection incorporates delay associated with deceleration, acceleration, stopping, and moving up in the queue. The following **Table 2** summarizes the relationship between delay and LOS for unsignalized intersections.

In order to meet City of Stockton Transportation Impact Analysis Guidelines, the average overall intersection delay and level of service have been reported for all unsignalized intersections evaluated.

E. SOFTWARE

The Synchro software program has been utilized for signalized intersection level of service, delay and queuing evaluation, while the TRAFFIX software program has been utilized for unsignalized intersection level of service and delay evaluation.

F. MINIMUM ACCEPTABLE OPERATION

City of Stockton:[1] Intersections within the downtown area – LOS E

Caltrans:[2] Any intersections serving State Route 4 freeway ramps in downtown Stockton – LOS D

G. SIGNAL TIMING

Existing commute period signal timing has been utilized for evaluation of year 2013 traffic flow along the Center Street, El Dorado Street and Stanislaus Street corridors.

H. IMPACT SIGNIFICANCE CRITERIA

1. City of Stockton

The City of Stockton defines significant impact as follows:

- For a city intersection, a transportation impact for a project is considered significant if the addition of project traffic would cause an intersection that would function at LOS D or better without the project to function at LOS E or F with the project.
- For downtown intersections, the minimum acceptable condition is LOS E.
- For city intersections with an LOS E or F condition without the project (or LOS F condition in the downtown), a transportation impact for a project is considered significant if the addition of project traffic causes an increase of greater than 5 seconds in the average delay for the intersection.

Additionally, the California Environmental Quality Act (CEQA) defines as significant impact when a project:

- Causes an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system.

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[1] City of Stockton Transportation Impact Analysis Guidelines, July 30, 2003.
[2] Caltrans District 10, Ms. Kathy Selsor, February 24, 2009, personal communication.

- Exceeds either individually or cumulatively, a level of service standard established by the County congestion management agency for designated roads or highways.

- Substantially increases hazards because of a design feature.

- Results in inadequate emergency access.

- Results in inadequate parking capacity.

- Conflicts with adopted policies, plans or programs supporting alternative transportation.

2. Caltrans

For an S.R.4 freeway ramp intersection in downtown Stockton, a transportation impact for a project is considered significant if the addition of project traffic would cause an intersection that would function at LOS D or better without the project to function at LOS E or F with the project.

For ramp intersections with an LOS E or F Base Case condition without the project, the addition of one additional peak hour vehicle due to a project is considered significant.

I. PLANNED CIRCULATION SYSTEM IMPROVEMENTS BY 2013

Neither the City nor Caltrans have any improvements planned by 2013 for any of the analysis intersections.

V. YEAR 2013 BASE CASE (WITHOUT PROJECT) CONDITIONS – HUNTER SQUARE SITE (PROPOSED PROJECT)

A. VOLUMES

Year 2013 AM and PM peak hour Base Case volumes have been developed for the 15 analysis intersections based upon the following methodology.

1. Existing (year 2008) volumes have been increased at a rate of 3 percent per year (15 percent total). This is a conservatively high rate that would take into account traffic from all projects near the downtown area likely to be built and fully occupied by 2013.

2. Traffic projected from the County's under construction 250,000-square-foot Administration Building has been added to the existing volumes and the 15 percent background growth. Trip generation projections for the County building are contained in **Table 3** and reflect use of trip rates from the Institute of Transportation Engineers. Traffic assignment of County building volumes has been based upon locations of parking garages in close proximity to the building, while regional distribution has been based

upon employee distribution patterns for staff working at the adjacent courthouse. Regional distribution using this methodology is similar to findings from the City's traffic model as presented in the Draft EIR for the Proposed Stockton Waterfront Redevelopment Plan Amendment.[3]

Resultant 2013 weekday Base Case AM and PM commute peak hour volumes are presented in **Figures 2** and **3**, respectively.

B. INTERSECTION OPERATION

1. Level of Service

Table 4 presents year 2013 Base Case AM and PM commute peak hour levels of service and average control delay for the 15 signalized intersections evaluated in this study. As shown, all would be expected to operate acceptably during both peak traffic hours. **Figure 4** provides a schematic presentation of approach lanes and control utilized for all 15 analysis intersections. There were no changes from existing conditions.

2. 95th Percentile Vehicle Queuing

Tables 5 and **6** present year 2013 Base Case AM and PM commute peak hour 95th percentile vehicle queuing on select approaches to all 15 analyzed intersections. As shown, with one exception, no 95th percentile queue would be expected to extend to the adjacent upstream intersection. The one exception would be the northbound El Dorado Street approach to Washington Street during the AM peak hour, where queues would occasionally be expected to extend through the Lafayette Street intersection.

VI. PROJECT TRAFFIC IMPACTS – HUNTER SQUARE SITE (PROPOSED PROJECT)

A. PROJECT TRIP GENERATION

The proposed project will contain 285,000 square feet of courthouse and office space, in addition to parking on the ground floor for judges. When complete, the existing County courthouse operation will move into the new building. The existing courthouse will then be utilized for government office space, with the exception of a ± 50,000-square-foot wing which will be demolished.

Trip generation rates for the proposed courthouse have been developed based upon extensive trip generation surveys at the existing courthouse. Details of these surveys are contained in the September 2008 San Joaquin County Court Traffic Study. As shown in **Table 7**, the new courthouse would be expected to generate 590 inbound and 66 outbound trips during the AM peak hour, with 60 inbound and 334 outbound trips during the PM peak hour. On a daily basis the courthouse serves about 300 staff and 300 jurors. Therefore, during the AM peak hour the heavy inbound traffic would be split roughly 50 percent for each group of people. However,

[3] January 2009 City of Stockton and Wagstaff & Associates.

during the PM peak hour most jurors would have left for the day and the vast majority of traffic would be associated with staff. After allowance for the trips being removed from the system due to the elimination of the 50,000-square-foot wing of the existing courthouse, the proposed project would result in a net increase of about 491 inbound and 54 outbound trips during the AM peak hour, with 16 inbound and 235 outbound net new trips during the PM peak hour.

B. PROJECT TRIP DISTRIBUTION

Project traffic was assigned to the subregional roadway system based upon findings from court surveys of the residential ZIP codes of a representative sample of staff and jurors. **Figure 5** presents the percent regional distribution of court-related traffic based upon the findings of these surveys. Overall, the vast majority (70 to 80 percent) of both staff and jurors would be expected to use the S.R.4 freeway and either the I-5 or S.R.99 freeways to access downtown Stockton. Once in downtown Stockton, the majority (85 percent) of jurors are projected by the court to use the Stewart-Eberhardt Garage just south of Weber Street (which can be accessed from both El Dorado Street and Center Street). The remaining 15 percent are projected to use the Coy Garage, which would be accessed via Hunter Street just north of Weber Street. In contrast, about 85 percent of staff are projected to use the Coy Garage, with the remaining 15 percent using the Stewart-Eberhardt Garage. A small percentage of both staff and jurors would also be expected to use on-street parking or other nearby garages.

Overall, during the AM peak hour about 285 of the new inbound trips would be expected to access the Stewart-Eberhardt Garage with about 205 accessing the Coy garage or other nearby garages and on-street parking. There would have been up to about 305 vehicles accessing the Coy Garage or other nearby parking, except the removal of the 50,000-square-foot wing of the existing courthouse eliminated about 100 inbound employee trips during the morning commute.

Figures 6 and **7** present the increment of net new project traffic assigned to the local roadway system during the AM and PM peak traffic hours respectively, while **Figures 8** and **9** present year 2013 Base Case + Project AM and PM peak hour volumes.

Review of **Figure 6** presenting the AM commute peak hour pattern of inbound project traffic shows that of the ± 300 project vehicles leaving the S.R.4 interchange area and traveling north into downtown on El Dorado Street, about 220 would turn left into the Stewart-Eberhardt Garage (south of Weber Street, between Center and El Dorado streets), with the remaining ± 75 to 80 vehicles continuing north through the East Weber Street intersection or turning right to East Weber Street to access the Coy Garage or other nearby on-street parking. For vehicles traveling south into downtown on North Center Street and various side streets, about 65 vehicles would continue south of East Weber Street to turn left into the Stewart-Eberhardt Garage (for a total entry of 285 vehicles into this facility). The remaining 25 or so vehicles from the north or northwest would travel east of North Center Street and cross El Dorado Street (to the north of East Weber Street) to access the Coy Garage or on-street parking. The remaining Coy Garage inbound traffic would either be exiting the westbound S.R.4 freeway at Stanislaus Street (about 80 vehicles) or using other surface streets from north, northeast or east of downtown (about 20 vehicles).

C. PROJECT TRAFFIC IMPACTS

1. Intersection Level of Service

Table 4 shows that the net change in year 2013 Base Case traffic due to the proposed project would not be expected to produce a significant level of service impact at any analyzed location. No intersection would have acceptable AM or PM peak hour 2013 Base Case level of service degrade to unacceptable operation due to the addition of project traffic. Also, there would be no locations evaluated with unacceptable Base Case level of service.

2. 95th Percentile Vehicle Queuing

Tables 5 and **6** show that the net change in 2013 Base Case traffic due to the proposed project would produce a significant queuing impact at only one location: on the northbound El Dorado Street approach to Washington Street during the AM peak hour. Base Case operation would already experience unacceptable queuing and the proposed project would increase the 95th percentile vehicle queue from 233 up to 284 feet (per lane) with only 210 feet of storage (per lane). AM peak hour traffic on this approach would be increased from 1,700 up to 1,905 vehicles, a 12 percent increase.

This would be significant impact #1.

VII. ALTERNATIVE SITE EVALUATION

A. YEAR 2013 BASE CASE (WITHOUT PROJECT) CONDITIONS – WASHINGTON STREET SITE

1. Volumes

Year 2013 Base Case volumes have been developed for 12 intersections during the AM peak hour and 6 intersections during the PM peak hour using the same methodology as previously described for intersections serving the proposed courthouse site. Six intersections along the Center Street and El Dorado Street corridors have been evaluated for both time periods, including the freeway ramp intersections with Washington and Lafayette streets. However, only AM peak hour conditions have been evaluated at 6 intersections adjacent to or near the alternative site due to minimum volume levels in this area during the PM peak hour. Volumes during the AM peak hour are higher due to the presence of traffic associated with an adjacent high school and this is the critical time period for local intersection operation. It should also be noted that there are students crossing many of the unsignalized intersections in the immediate vicinity of the alternative site, both before and after school.

Figures 10 and **11** present year 2013 Base Case AM and PM peak hour volumes.

2. Intersection Operation

a. Level of Service

Table 8 shows that all evaluated intersections would be operating at acceptable year 2013 Base Case levels of service during both the AM and PM peak traffic hours. The 6 unsignalized intersections evaluated for this study in close proximity to the courthouse site would all be operating at level of service A conditions. **Figure 12** provides a schematic presentation of approach lanes and control at the intersections evaluated for the alternative site.

b. Signal Warrant Evaluation

i. Methodology

Traffic signals are used to provide an orderly flow of traffic through an intersection. Many times they are needed to offer side street traffic an opportunity to access a major road where high volumes and/or high vehicle speeds block crossing or turn movements. They do not, however, increase the capacity of an intersection (i.e., increase the overall intersection's ability to accommodate additional vehicles) and, in fact, often slightly reduce the number of total vehicles that can pass through an intersection in a given period of time. Signals can also cause an increase in traffic accidents if installed at inappropriate locations.

There are 8 possible tests for determining whether a traffic signal should be considered for installation. These tests, called "warrants", consider criteria such as actual traffic volume, pedestrian volume, presence of school children, and accident history. The intersection volume data together with the available collision histories were compared to warrants contained in the *Manual on Uniform Traffic Control Devices* (MUTCD), Federal Highway Administration, 2003, California Supplement, which has been adopted by the State of California as a replacement for *Caltrans Traffic Manual*. Section 4C of the MUTCD provides guidelines, or warrants, which may indicate need for a traffic signal at an unsignalized intersection. As indicated in the MUTCD, satisfaction of one or more warrants does not necessarily require immediate installation of a traffic signal. It is merely an indication that the local jurisdiction should begin monitoring conditions at that location and that a signal may ultimately be required.

Warrant 3, the peak hour volume warrant, is often used as an initial check of signalization needs since peak hour volume data is typically available and this warrant is usually the first one to be met. Warrant 3 is based on a curve and takes only the hour with the highest volume of the day into account. Please see the **Appendix** for the warrant chart. To meet this warrant, a minimum of 100 vehicles per hour must approach the intersection on one of the side streets. It should also be noted that Warrant 3 has a second set of criteria based upon a combination of vehicle delay and volumes. This is typically referred to as the peak hour delay warrant.

ii. Findings

All 6 unsignalized intersections evaluated near the alternative site would have AM peak hour volume levels well below peak hour signal warrant #3 criteria levels.

c. 95th Percentile Vehicle Queuing

Tables 9 and **10** present year 2013 Base Case AM and PM commute peak hour 95th percentile vehicle queuing on select approaches to the six intersections evaluated along the Center Street and El Dorado Street corridors. As shown, with one exception, no 95th percentile queues would be expected to extend to the adjacent upstream intersection. The one exception would be the northbound El Dorado Street approach to Washington Street during the AM peak hour, where queues would occasionally be expected to extend through the Lafayette Street intersection.

B. PROJECT TRAFFIC IMPACTS

1. Project Trip Generation & Distribution

The net increase in trip generation to/from downtown Stockton will be the same for the Washington Street alternative site as for the proposed site in Hunter Square. However, the streets serving the alternative site will attract the full trip generation potential of the new courthouse (per **Table 5 –** 590 inbound and 66 outbound trips during the AM peak hour, with 60 inbound and 334 outbound trips during the PM peak hour). The elimination of 50,000 square feet of existing courthouse space will then result in a reduction of traffic to/from the vicinity of this facility (per **Table 5 –** removal of 99 inbound and 12 outbound trips during the AM peak hour, with 44 inbound and 99 outbound trips eliminated during the PM peak hour).

The alternative site courthouse will also result in about 90 new AM peak hour vehicle trips being made from the downtown area to the new courthouse. These trips will be made from the DA's office, probation office, public defender's office, City/County offices and private offices. Currently, these trips are made by foot in the downtown area and would continue to be made on foot with the new courthouse at Hunter's Square.

The alternative site will also attract auto and some walking trips during the course of a normal business day between downtown and the project site. Since the number of project-related back-and-forth trips should be lower than the total project traffic demand during the peak commute periods and since background (non-project) traffic volumes would be less than during commute periods, analysis of operating conditions during the peak commute traffic hours would evaluate the worst potential operating conditions and project traffic impacts during the day.

Figures 13 and **14** present the increment of net new project traffic associated with the alternative site assigned to the local roadway system during the AM and PM peak traffic hours respectively, while **Figures 15** and **16** present year 2013 Base Case + Project AM and PM peak hour volumes.

2. Project Traffic Impacts

a. Intersection Level of Service

Table 8 shows that the net change in year 2013 Base Case traffic due to the alternative site project would not be expected to produce a significant level of service impact at any analyzed location. No intersection would have acceptable AM or PM peak hour 2013 Base Case level of service degrade to unacceptable operation due to the addition of project traffic. Also, there would be no locations evaluated with unacceptable Base Case level of service.

b. Signal Warrants

The addition of alternative site project traffic would not increase year 2013 Base Case volumes to meet peak hour signal warrant criteria levels.

c. 95th Percentile Vehicle Queuing

Tables 9 and **10** show that the net change in year 2013 Base Case traffic due to the alternative site project would produce a significant queuing impact at only one location: on the northbound El Dorado Street approach to Washington Street during the AM peak hour. Base Case operation would already experience unacceptable queuing and the proposed project would increase the 95th percentile vehicle queue from 233 up to 254 feet (per lane) with only 210 feet of storage (per lane). AM peak hour traffic on this approach would be increased from 1,700 up to 1,796 vehicles, a 6 percent increase.

This would be significant impact #1A.

d. Pedestrian (Student) Crossings at Unsignalized Intersections Near the Project Site

The addition of project traffic to East Weber Street, South Madison Street, Washington Street and Market Street will increase safety concerns at unsignalized intersections for students walking to the nearby high school (Weber Institute). This is a particular concern for students crossing Weber Street due to its width.

This is a potentially significant impact (#2).

VIII. MITIGATION MEASURES

A. PROPOSED SITE

1. Mitigation Measure 1

There are no timing or widening improvements feasible to mitigate this measure to a less than significant impact.

2. Mitigation Measure 2

Safety measures shall be installed at intersections near the project site to facilitate safe student crossings. Locations and measures will be selected by the school district and City of Stockton Public Works Department.

B. ALTERNATIVE SITE

1. Mitigation Measure 1A

There are no timing or widening improvements feasible to mitigate this measure to a less than significant impact.

Table 1

SIGNALIZED INTERSECTION LOS CRITERIA

Level of Service	Description	Average Control Delay (Seconds Per Vehicle)
A	Operations with very low delay occurring with favorable progression and/or short cycle lengths.	< 10.0
B	Operations with low delay occurring with good progression and/or short cycle lengths.	10.1 to 20.0
C	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	20.1 to 35.0
D	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, and/or high volume-to-capacity (V/C) ratios. Many vehicles stop and individual cycle failures are noticeable.	35.1 to 55.0
E	Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences. This is considered to be the limit of acceptable delay.	55.1 to 80.0
F	Operation with delays unacceptable to most drivers occurring due to oversaturation, poor progression, or very long cycle lengths.	> 80.0

Source: 2000 Highway Capacity Manual (Transportation Research Board).

Table 2

UNSIGNALIZED INTERSECTION LOS CRITERIA

Level of Service	Description	Average Control Delay (Seconds Per Vehicle)
A	Little or no delays	< 10.0
B	Short traffic delays	10.1 to 15.0
C	Average traffic delays	15.1 to 25.0
D	Long traffic delays	25.1 to 35.0
E	Very long traffic delays	35.1 to 50.0
F	Extreme traffic delays with intersection capacity exceeded (for an all-way stop), or with approach/turn movement capacity exceeded (for a side street stop controlled intersection)	> 50.0

Source: 2000 Highway Capacity Manual (Transportation Research Board).

Table 3

APPROVED DEVELOPMENT TRIP GENERATION

		AM PEAK HOUR TRIPS				PM PEAK HOUR TRIPS			
		INBOUND		OUTBOUND		INBOUND		OUTBOUND	
USE	**SIZE**	**RATE**	**VOL**	**RATE**	**VOL**	**RATE**	**VOL**	**RATE**	**VOL**
County Administration Building	250,000 SQ.FT.	1.97	493	.24	60	.88	220	1.97	493

Trip Rate Sources: Trip Generation, 8th Edition, by the Institute of Transportation Engineers (ITE) 2008.
Compiled by: Crane Transportation Group

Table 4

INTERSECTION LEVEL OF SERVICE
YEAR 2013

PROPOSED HUNTER SQUARE COURTHOUSE SITE

INTERSECTION	TIME PERIOD	BASE CASE		BASE CASE + PROJECT	
		DELAY[1]	LOS[2]	DELAY[1]	LOS[2]
1. Center/Park (Signal)	AM	11.8	B	12.0	B
	PM	20.5	C	20.5	C
2. El Dorado/Park (Signal)	AM	5.9	A	5.9	A
	PM	9.2	A	9.2	A
3. Center/Oak (Signal)	AM	8.1	A	8.1	A
	PM	5.4	A	5.4	A
4. El Dorado/Oak (Signal)	AM	4.5	A	4.5	A
	PM	5.2	A	5.2	A
5. Center/Fremont (Signal)	AM	5.2	A	5.2	A
	PM	5.1	A	5.2	A
6. El Dorado/Fremont (Signal)	AM	10.2	B	10.2	B
	PM	10.9	B	10.9	A
7. Center/Weber (Signal)	AM	11.9	B	11.9	B
	PM	20.3	C	21.1	C
8. El Dorado/Weber (Signal)	AM	12.9	B	12.9	B
	PM	11.3	B	12.3	B
9. Weber/California (Signal)	AM	13.0	B	13.1	B
	PM	11.7	B	11.7	B
10. Center/Washington (Signal)	AM	13.9	B	13.9	B
	PM	10.7	B	11.1	C
11. El Dorado/Washington – WB S.R.4 Off-Ramp (Signal)	AM	24.5	C	28.5	C
	PM	48.5	D	48.7	D
12. Stanislaus/Washington – WB S.R.4 Off-Ramp (Signal)	AM	23.6	C	24.8	C
	PM	17.7	B	18.7	B
13. Center/Lafayette – EB S.R.4 Off-Ramp (Signal)	AM	28.0	C	45.8	D
	PM	14.2	B	14.5	B
14. El Dorado/Lafayette – WB S.R.4 On-Ramp (Signal)	AM	9.4	A	10.0	B
	PM	21.8	C	21.8	C
15. Stanislaus/Lafayette – EB S.R.4 On-Ramp (Signal)	AM	47.2	D	49.4	D
	PM	45.9	D	49.4	D

(1) Delay = Control delay per vehicle in seconds.
(2) LOS = Level of Service

Year 2000 Highway Capacity Manual Analysis Methodology – Synchro Software Evaluation
Source: Crane Transportation Group

Table 5

95TH PERCENTILE VEHICLE QUEUING
YEAR 2013
PROPOSED HUNTER SQUARE COURTHOUSE SITE

AM PEAK HOUR

INTERSECTION	APPROACH	STORAGE (PER LANE) IN FEET	95TH PERCENTILE QUEUING (PER LANE) IN FEET	
			BASE CASE	BASE CASE + PROJECT
Center/Park	SB Center Through	300	223	235
Center/Oak	SB Center Through	300	57	60
Center/Fremont	SB Center Through	270	34	34
Center/Weber	WB Weber Through/left	290	38	38
Center/Washington	SB Center WB Washington	300 300	22 125	23 125
Center/Lafayette	SB Center Left SB Center Through	210 210	189 66	196 66
El Dorado/Lafayette	NB El Dorado EB Lafayette Left	330 330	96 113	97 154
El Dorado/Washington	NB El Dorado Through	210	233	284
El Dorado/Weber	NB El Dorado Through/EB Weber Through/Left	500 300	188 75	188 75
El Dorado/Fremont	NB El Dorado Through	280	140	140
El Dorado/Oak	NB El Dorado Through	275	38	38
El Dorado/Park	NB El Dorado Through	300	22	22

Year 2000 Highway Capacity Manual Analysis Methodology – Synchro Software Evaluation
Source: Crane Transportation Group

Table 6

95TH PERCENTILE VEHICLE QUEUING
YEAR 2013
PROPOSED HUNTER SQUARE COURTHOUSE SITE

PM PEAK HOUR

INTERSECTION	APPROACH	STORAGE (PER LANE) IN FEET	95TH PERCENTILE QUEUING (PER LANE) IN FEET	
			BASE CASE	BASE CASE + PROJECT
Center/Park	SB Center Through	300	253	253
Center/Oak	SB Center Through	300	29	29
Center/Fremont	SB Center Through	270	34	34
Center/Weber	WB Weber Through/left	290	102	154
Center/Washington	SB Center WB Washington	300 300	71 282	87 282
Center/Lafayette	SB Center left SB Center Through	210 210	167 50	169 53
El Dorado/Lafayette	NB El Dorado EB Lafayette	330 330	128 177	128 177
El Dorado/Washington	NB El Dorado Through	210	155	156
El Dorado/Weber	NB El Dorado Through/EB Weber Through/Left	500 300	144 28	150 47
El Dorado/Fremont	NB El Dorado Through	280	80	82
El Dorado/Oak	NB El Dorado Through	275	34	34
El Dorado/Park	NB El Dorado Through	300	46	51

Year 2000 Highway Capacity Manual Analysis Methodology – Synchro Software Evaluation
Source: Crane Transportation Group

Table 7

PROJECT TRIP GENERATION

		AM PEAK HOUR TRIPS				PM PEAK HOUR TRIPS			
		INBOUND		OUTBOUND		INBOUND		OUTBOUND	
USE	SIZE	RATE	VOL	RATE	VOL	RATE	VOL	RATE	VOL
New Courthouse (office space)	285,000 SQ.FT.	2.07	590	.23	66	.21	60	1.17	334
Old Courthouse Wing Demolished	50,000 SQ.FT.	1.97	(-99)	.24	(-12)	.88	(-44)	1.97	(-99)
Net New Traffic Due to Project			491		54		16		235

Trip Rate Sources: *New Courthouse: Court trip rate based upon surveys at the existing County Court Building on Weber Street in Stockton (April & May 2008).*
Old Courthouse Wing: To be demolished – would have been used for government offices – Trip Generation, 8th Edition, by the Institute of Transportation Engineers (ITE) 2008.

Compiled by: Crane Transportation Group

Table 8

INTERSECTION LEVEL OF SERVICE
YEAR 2013

PROPOSED WASHINGTON STREET COURTHOUSE SITE

INTERSECTION	TIME PERIOD	BASE CASE DELAY	BASE CASE LOS[3]	BASE CASE + PROJECT DELAY	BASE CASE + PROJECT LOS[3]
Van Buren/Weber (Unsignalized)	AM	1.2[1]	A	3.2	A
Madison/Weber (Unsignalized)	AM	.8[1]	A	.9	A
Madison/Market (Unsignalized)	AM	1.6[1]	A	5.1	A
Madison/Washington (Unsignalized)	AM	2.3[1]	A	3.6	A
Lincoln/Washington (Unsignalized)	AM	3.3[1]	A	3.3	A
Madison/Lafayette (Unsignalized)	AM	4.2[1]	A	8.0	A
Center/Washington (Signal)	AM PM	13.9[2] 10.7[2]	B B	17.0 11.7	B B
El Dorado/Washington – WB S.R.4 Off-Ramp (Signal)	AM PM	24.5[2] 48.5[2]	C D	29.8 48.5	C D
Center/Lafayette – EB S.R.4 Off-Ramp (Signal)	AM PM	28.0[2] 14.2[2]	C B	47.6 16.5	D B
El Dorado/Lafayette – WB S.R.4 On-Ramp (Signal)	AM PM	9.4[2] 21.8[2]	A C	9.5 21.9	A C
Center/Weber (Signal)	AM PM	11.9 20.3	B C	12.1 26.6	B C
El Dorado/Weber (Signal)	AM PM	12.9 11.3	B B	12.9 11.3	B B

LOS = Level of Service

(1) Delay = Average control delay per vehicle in seconds for the entire intersection (unsignalized intersection).
(2) Delay = Control delay per vehicle in seconds (signalized intersection).
(3) LOS = Level of Service

Source: Crane Transportation Group

Table 9

95TH PERCENTILE VEHICLE QUEUING
YEAR 2013
PROPOSED WASHINGTON STREET COURTHOUSE SITE
AM PEAK HOUR

INTERSECTION	APPROACH	STORAGE (PER LANE) IN FEET	95TH PERCENTILE QUEUING (PER LANE) IN FEET	
			BASE CASE	BASE CASE + PROJECT
Center/Weber	WB Weber Through/left	290	35	39
Center/Washington	SB Center Left WB Washington	300 300	22 125	24 189
Center/Lafayette	SB Center Left SB Center Through	210 210	189 66	189 66
El Dorado/Lafayette	NB El Dorado EB Lafayette	330 330	96 113	97 113
El Dorado/Washington	NB El Dorado Through	210	233	254
El Dorado/Weber	NB El Dorado Through/EB Weber Through/Left	500 300	188 75	188 93

Year 2000 Highway Capacity Manual Analysis Methodology – Synchro Software Evaluation
Source: Crane Transportation Group

Table 10

95TH PERCENTILE VEHICLE QUEUING
YEAR 2013
PROPOSED WASHINGTON STREET COURTHOUSE SITE
PM PEAK HOUR

INTERSECTION	APPROACH	STORAGE (PER LANE) IN FEET	95TH PERCENTILE QUEUING (PER LANE) IN FEET	
			BASE CASE	BASE CASE + PROJECT
Center/Weber	WB Weber Through/left	290	102	76
Center/Washington	SB Center Left WB Washington	300 300	71 282	86 295
Center/Lafayette	SB Center Left SB Center Through	210 210	43 50	79 48
El Dorado/Lafayette	NB El Dorado EB Lafayette	330 330	128 177	138 182
El Dorado/Washington	NB El Dorado Through	210	155	155
El Dorado/Weber	NB El Dorado Through/EB Weber Through/Left	500 300	144 141	216 123

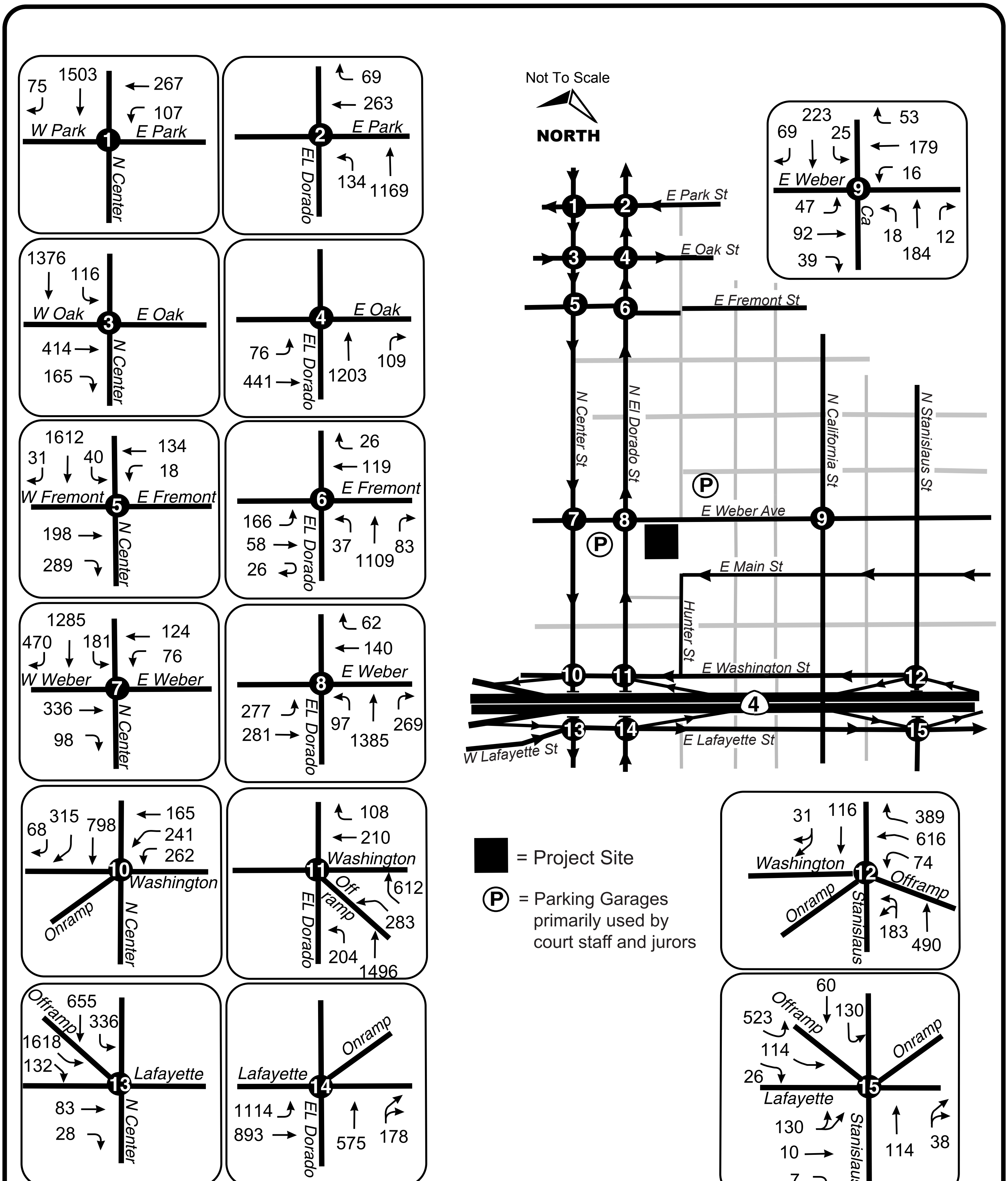
Year 2000 Highway Capacity Manual Analysis Methodology – Synchro Software Evaluation
Source: Crane Transportation Group

P = Project Site
A = Alternative Project Site

San Joaquin County Court Traffic Study - Stockton

Figure 1
Area Map

CRANE TRANSPORTATION GROUP

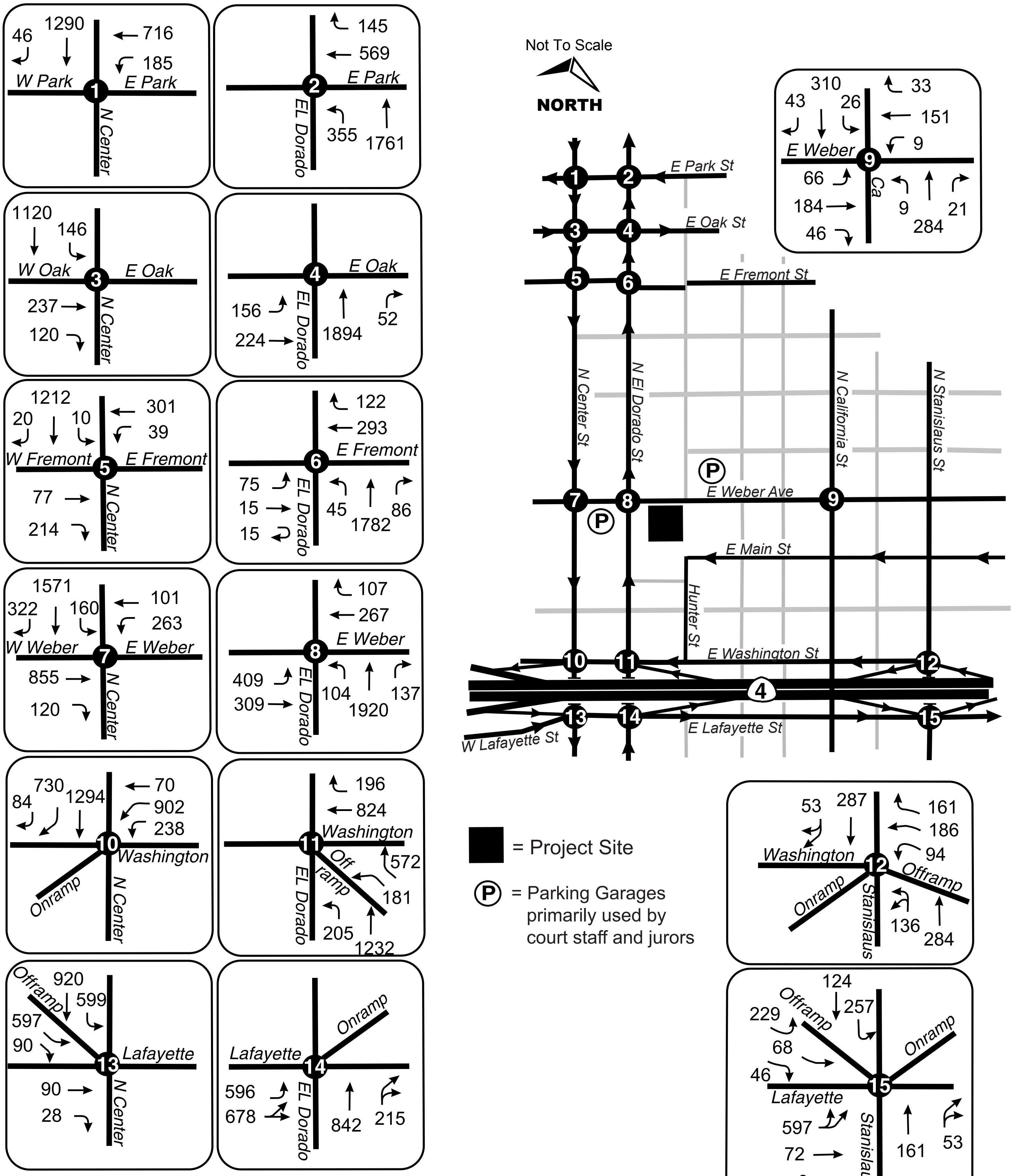


San Joaquin County Court Traffic Study - Stockton

CRANE TRANSPORTATION GROUP

Figure 2

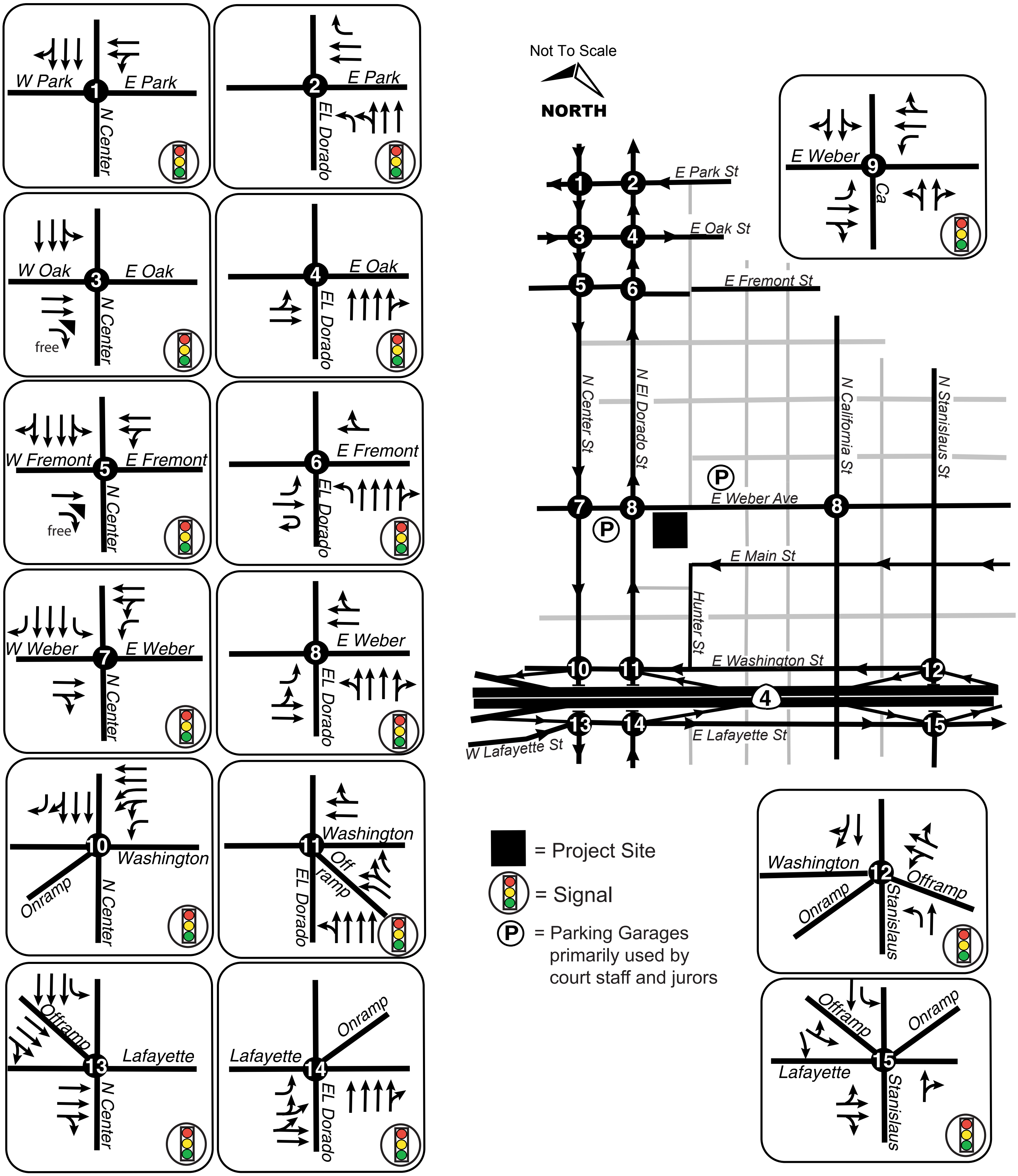
Year 2013 Base Case AM Peak Hour Volumes



CRANE TRANSPORTATION GROUP

Figure 3

Year 2013 Base Case PM Peak Hour Volumes



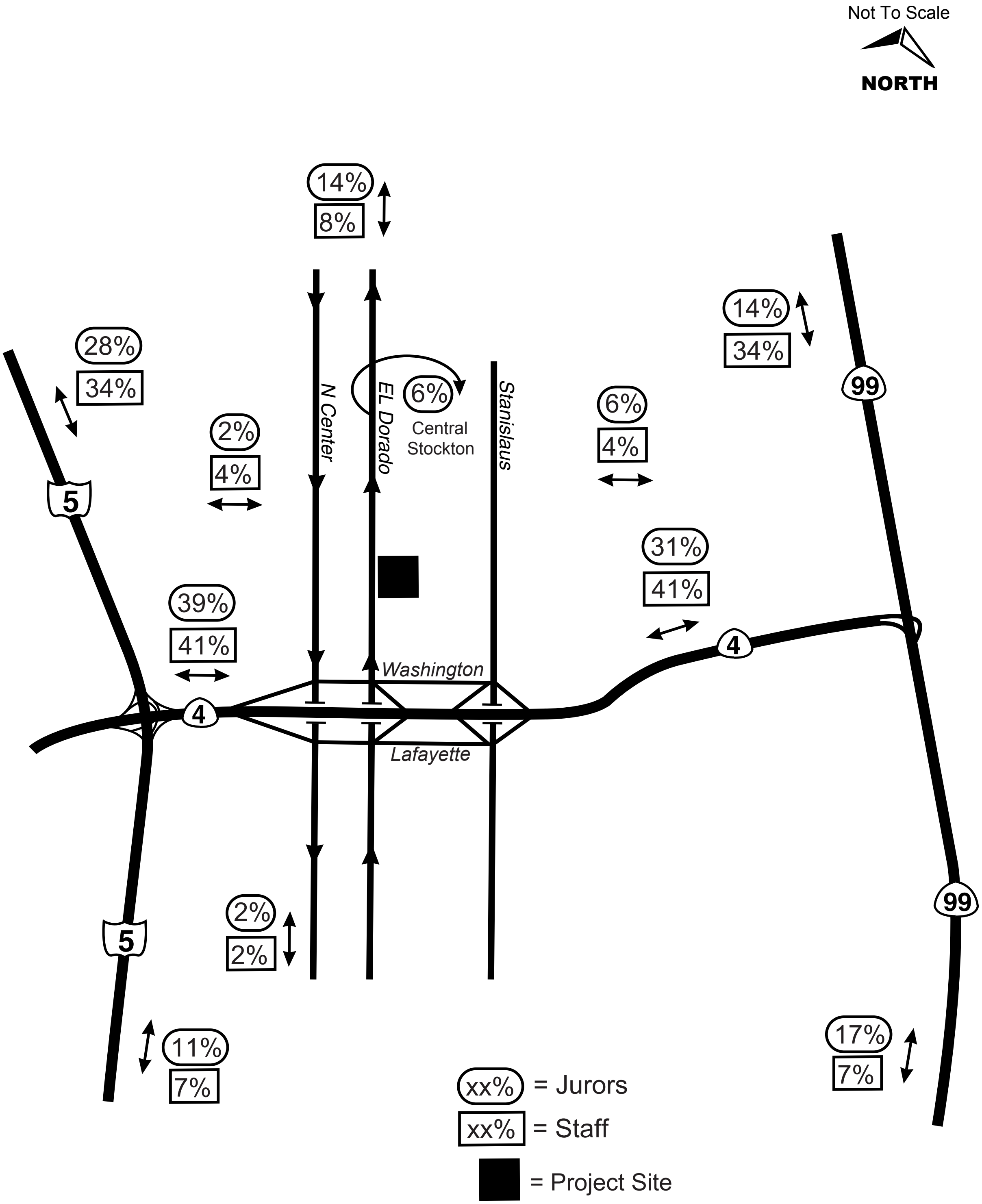
San Joaquin County Court Traffic Study - Stockton

Figure 4

Proposed Site Year 2013

Lane Geometrics and Intersection Control

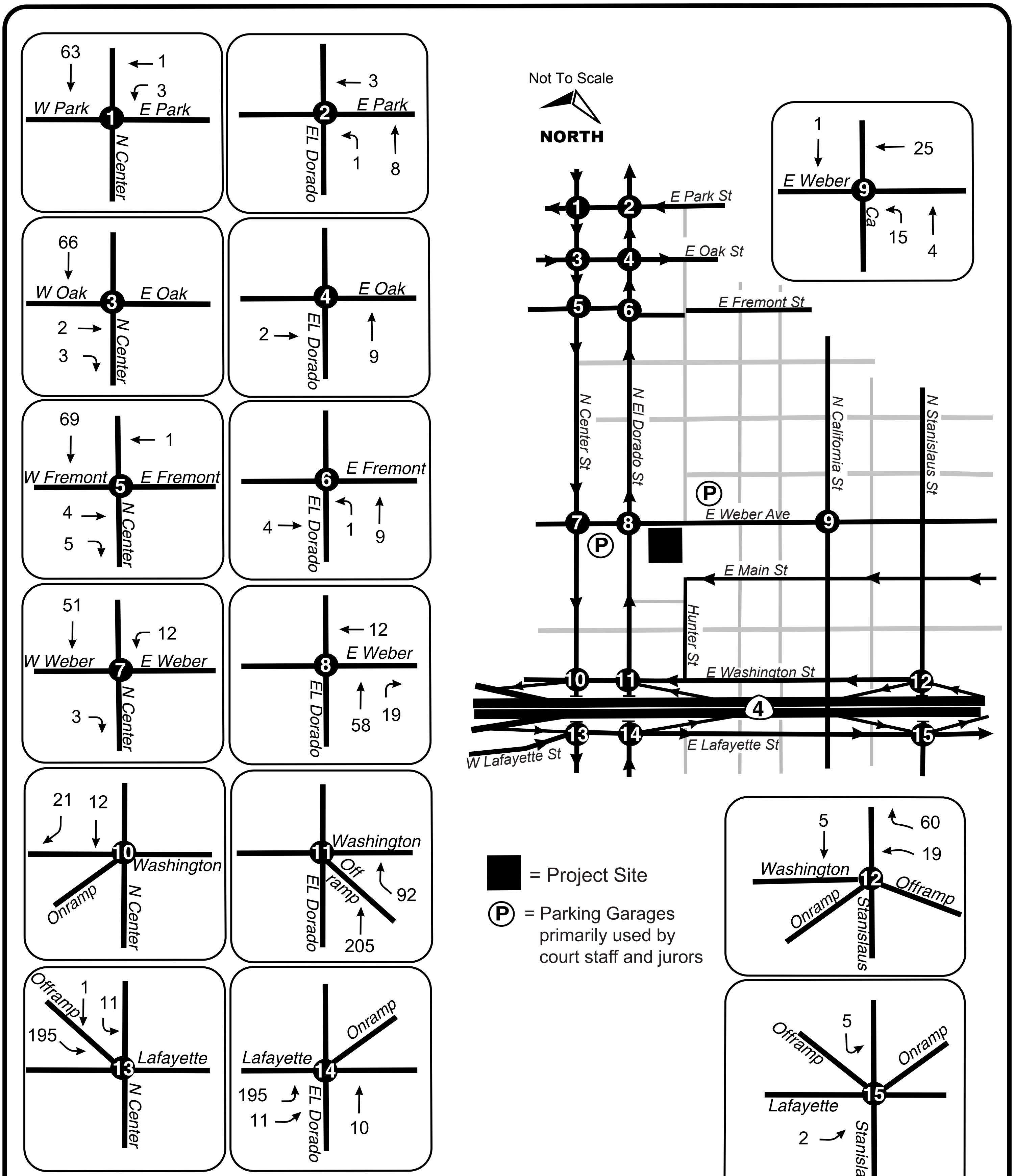
CRANE TRANSPORTATION GROUP



Distribution percentages based upon surveys of staff and juror residential ZIP codes at existing County courthouse.

CRANE TRANSPORTATION GROUP

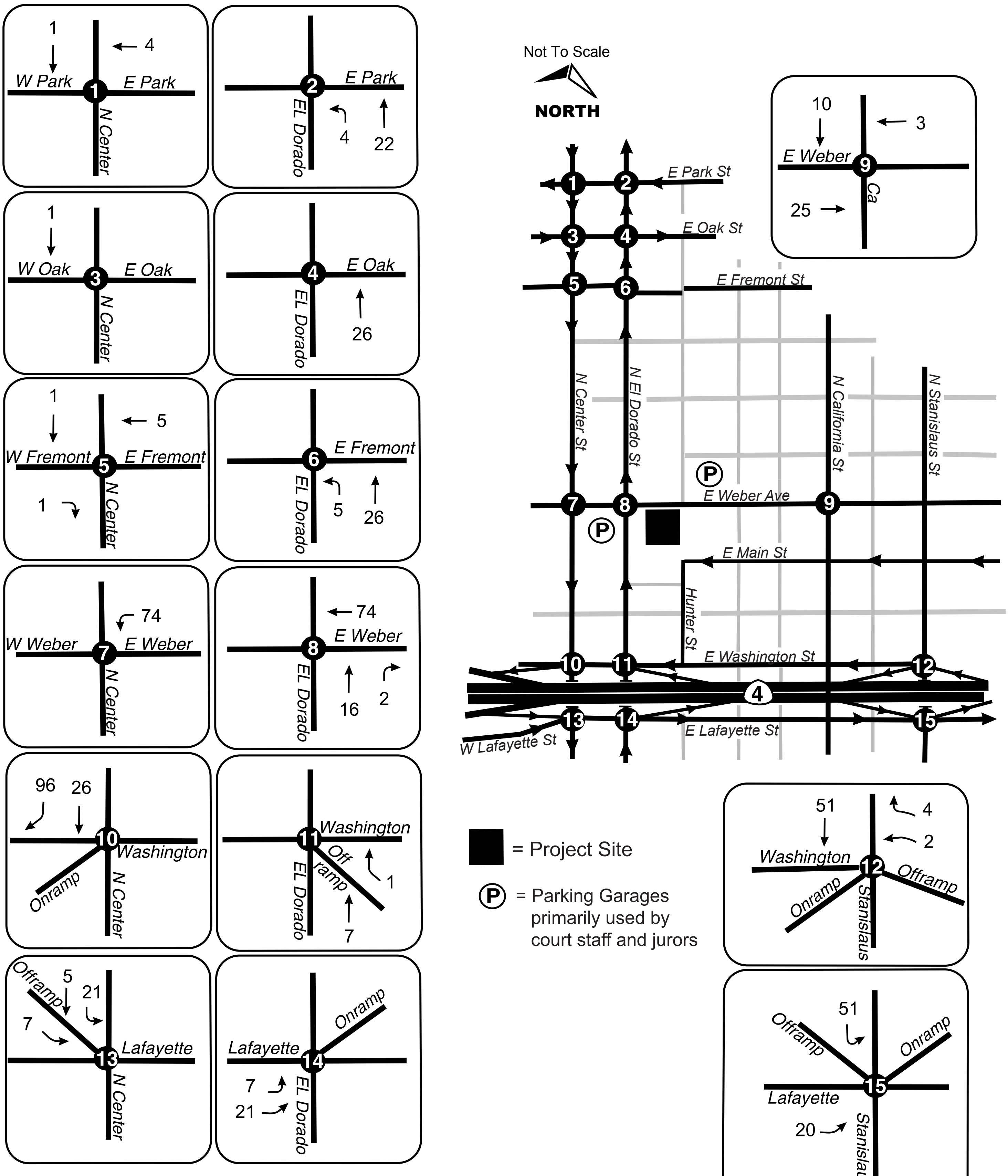
Figure 5
Staff and Juror % Traffic Distribution



San Joaquin County Court Traffic Study - Stockton

CRANE TRANSPORTATION GROUP

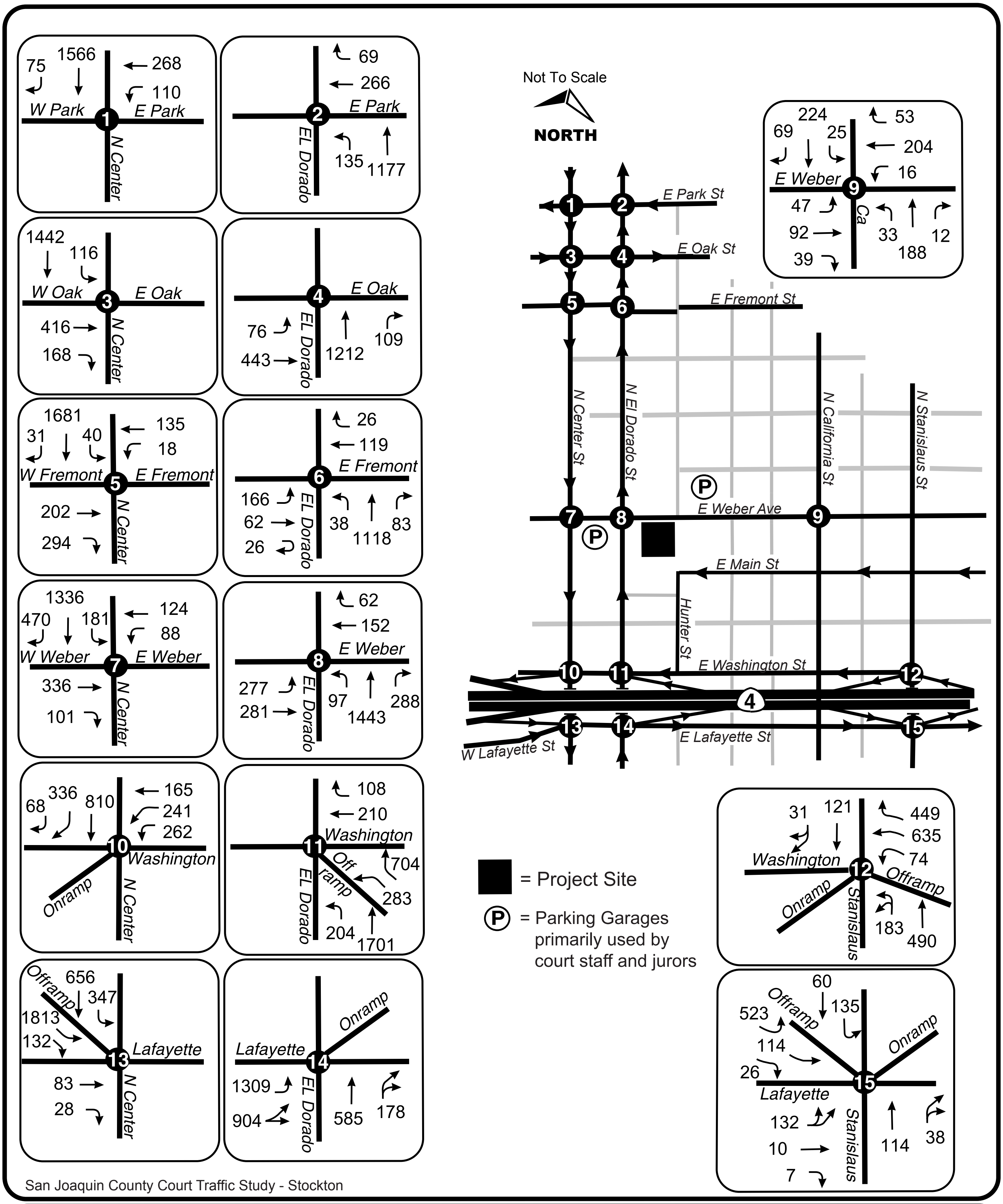
Figure 6
AM Peak Hour
Project Increment Volumes



San Joaquin County Court Traffic Study - Stockton

Figure 7
PM Peak Hour
Project Increment Volumes

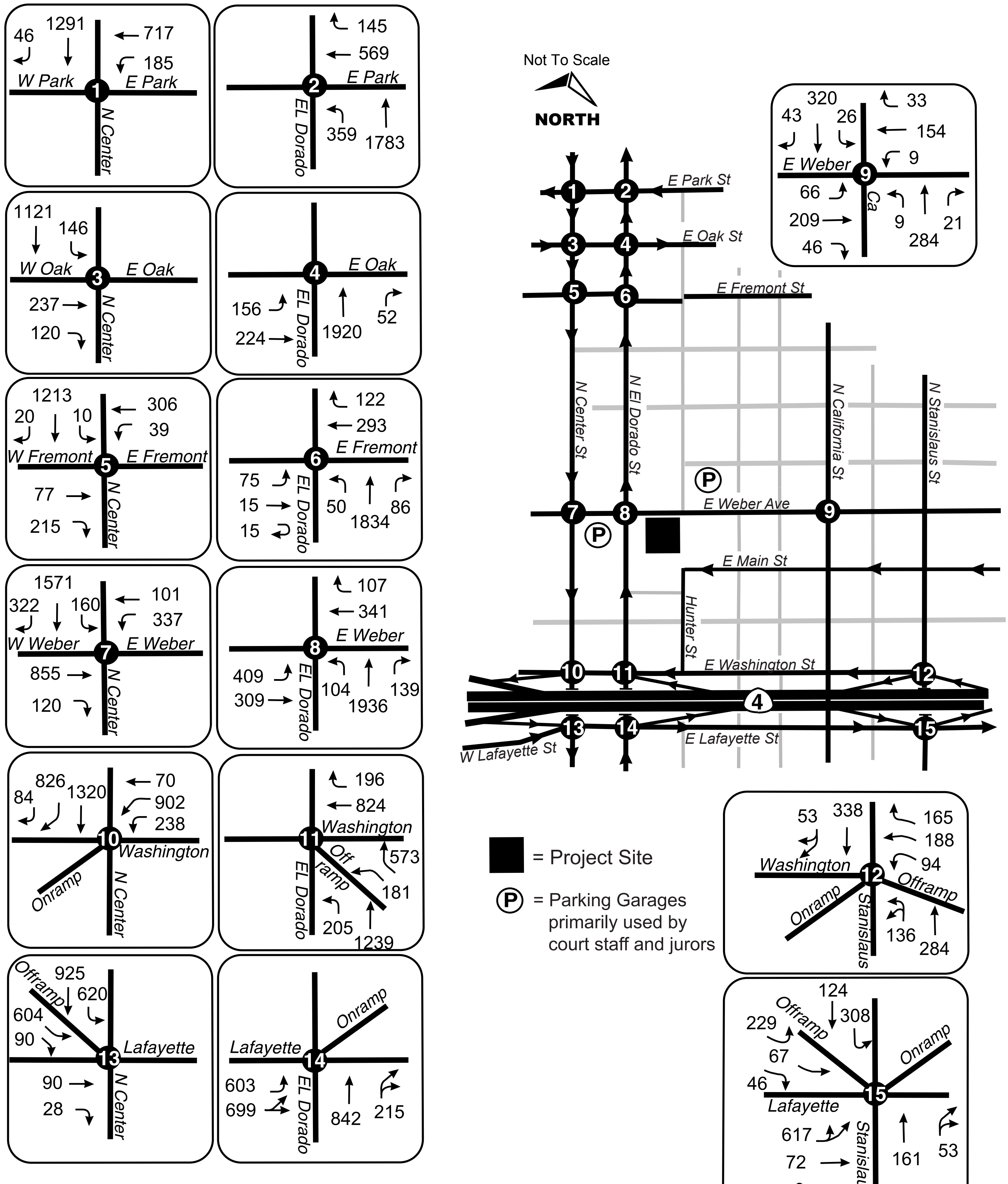
CRANE TRANSPORTATION GROUP



CRANE TRANSPORTATION GROUP

Figure 8

Year 2013 Base Case + Project AM Peak Hour Volumes

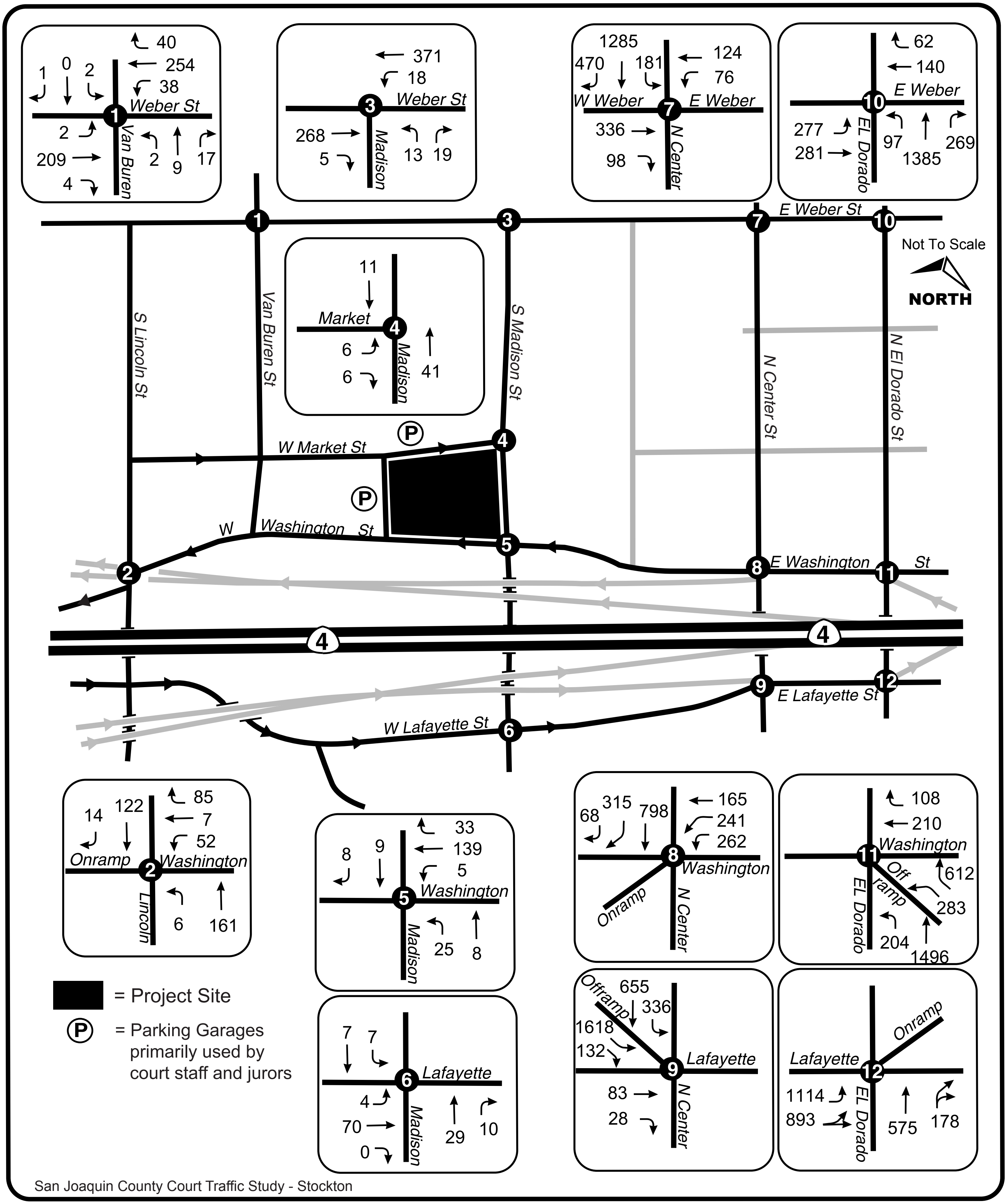


San Joaquin County Court Traffic Study - Stockton

Figure 9

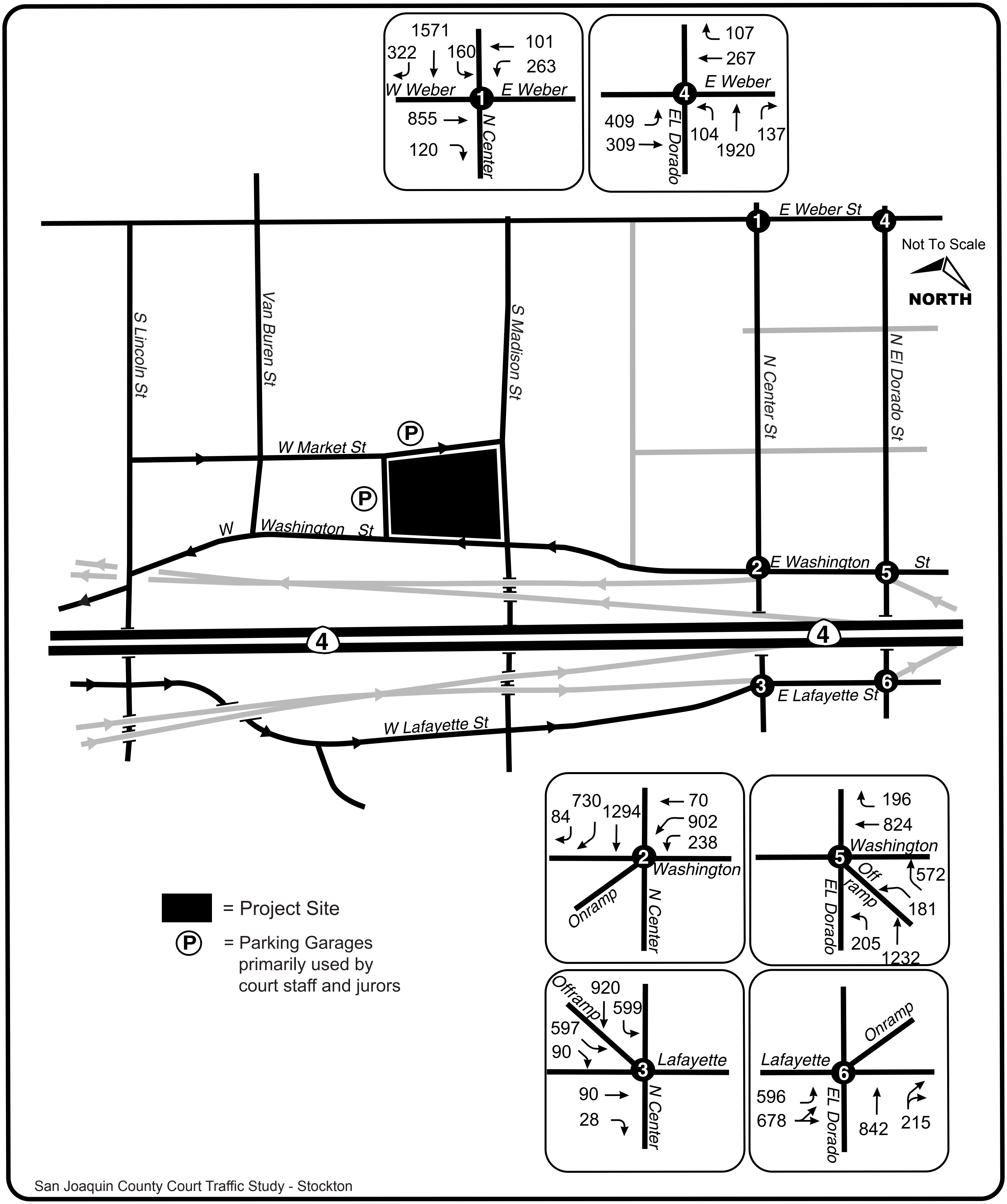
Year 2013 Base Case + Project PM Peak Hour Volumes

CRANE TRANSPORTATION GROUP



CRANE TRANSPORTATION GROUP

Figure 10
Alternative Site
Year 2013 Base Case
AM Peak Hour Volumes



CRANE TRANSPORTATION GROUP

Figure 11
Alternative Site
Year 2013 Base Case
PM Peak Hour Volumes

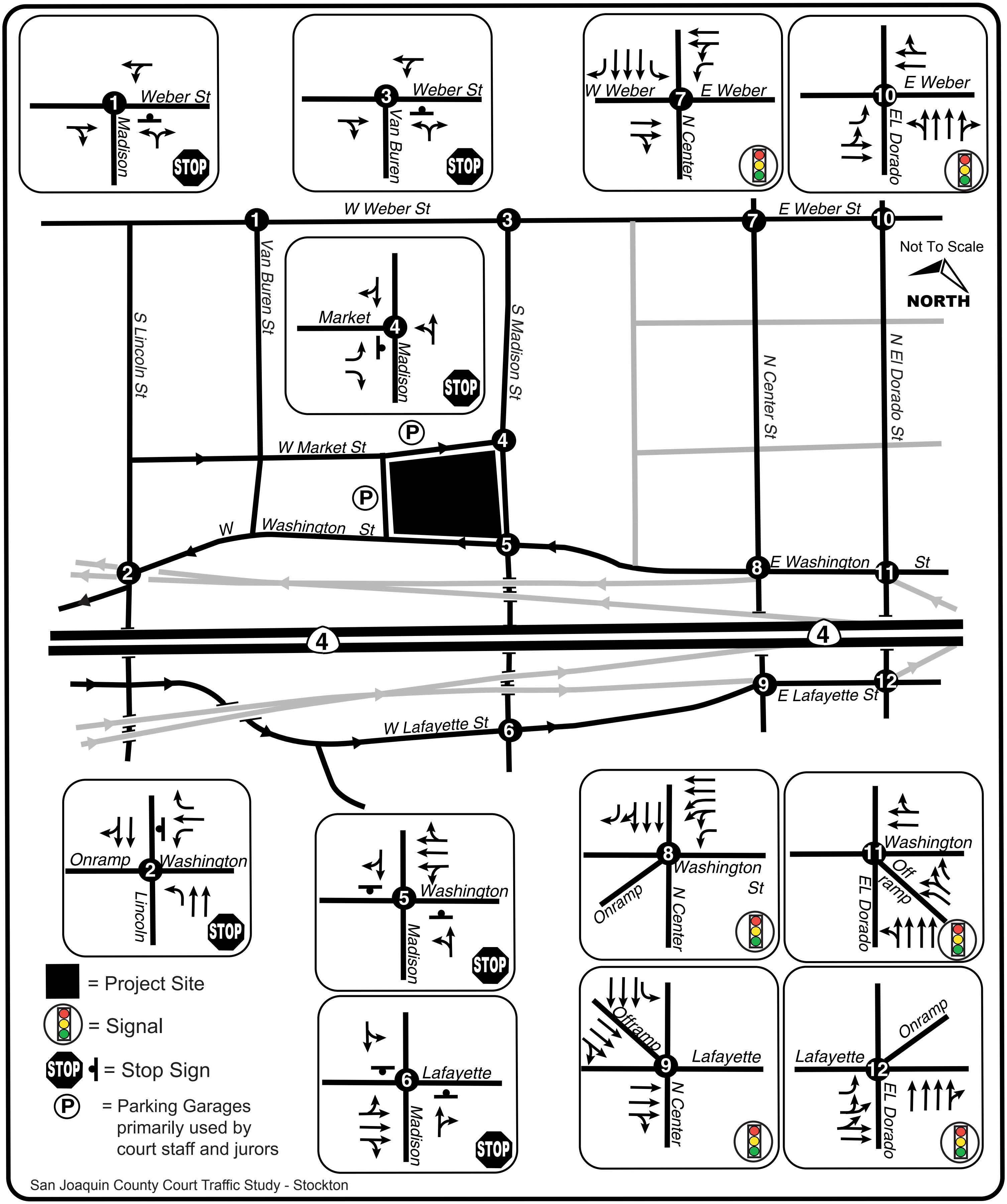
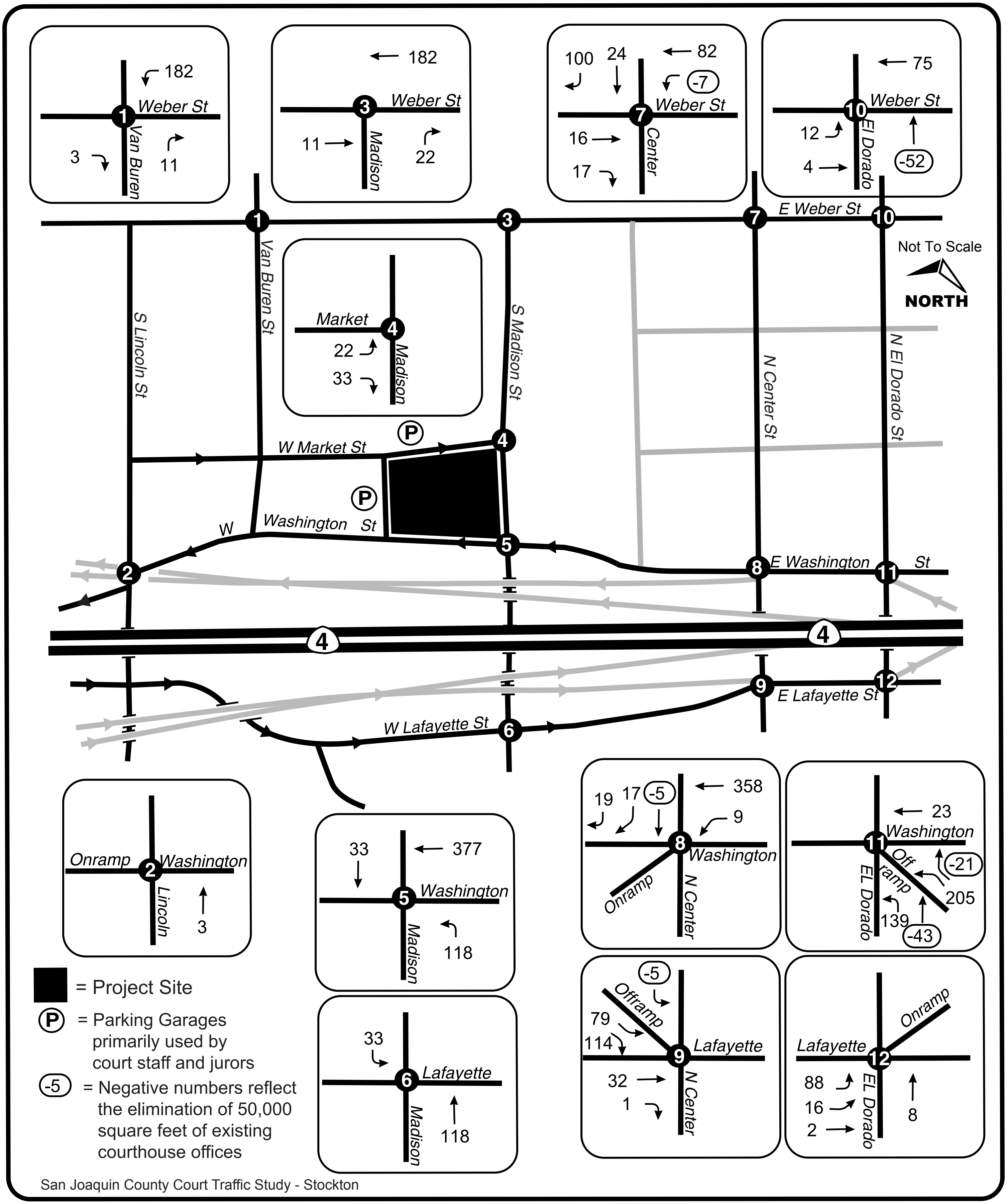


Figure 12

Alternative Site Year 2013

Lane Geometrics and Intersection Control

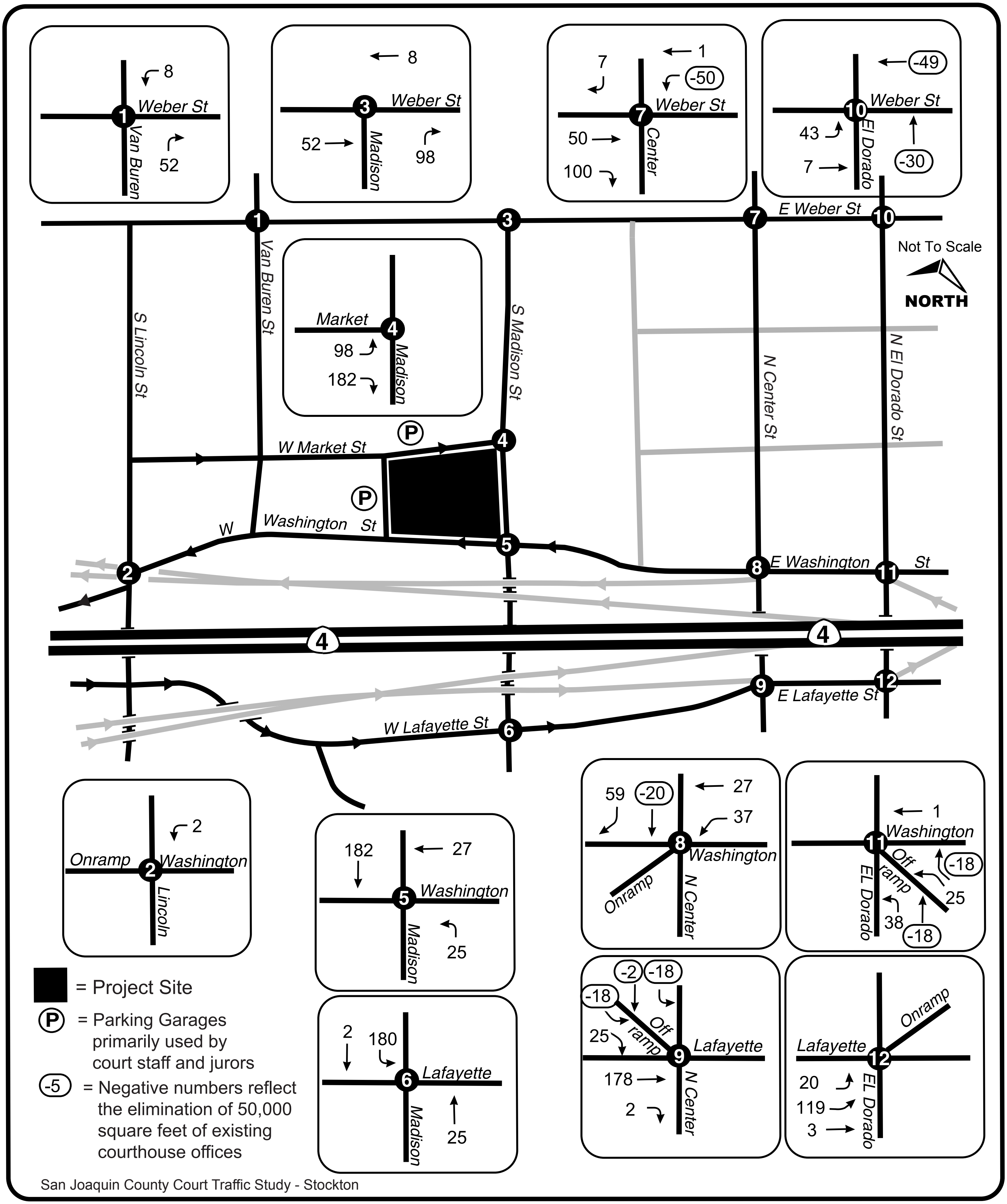
CRANE TRANSPORTATION GROUP



San Joaquin County Court Traffic Study - Stockton

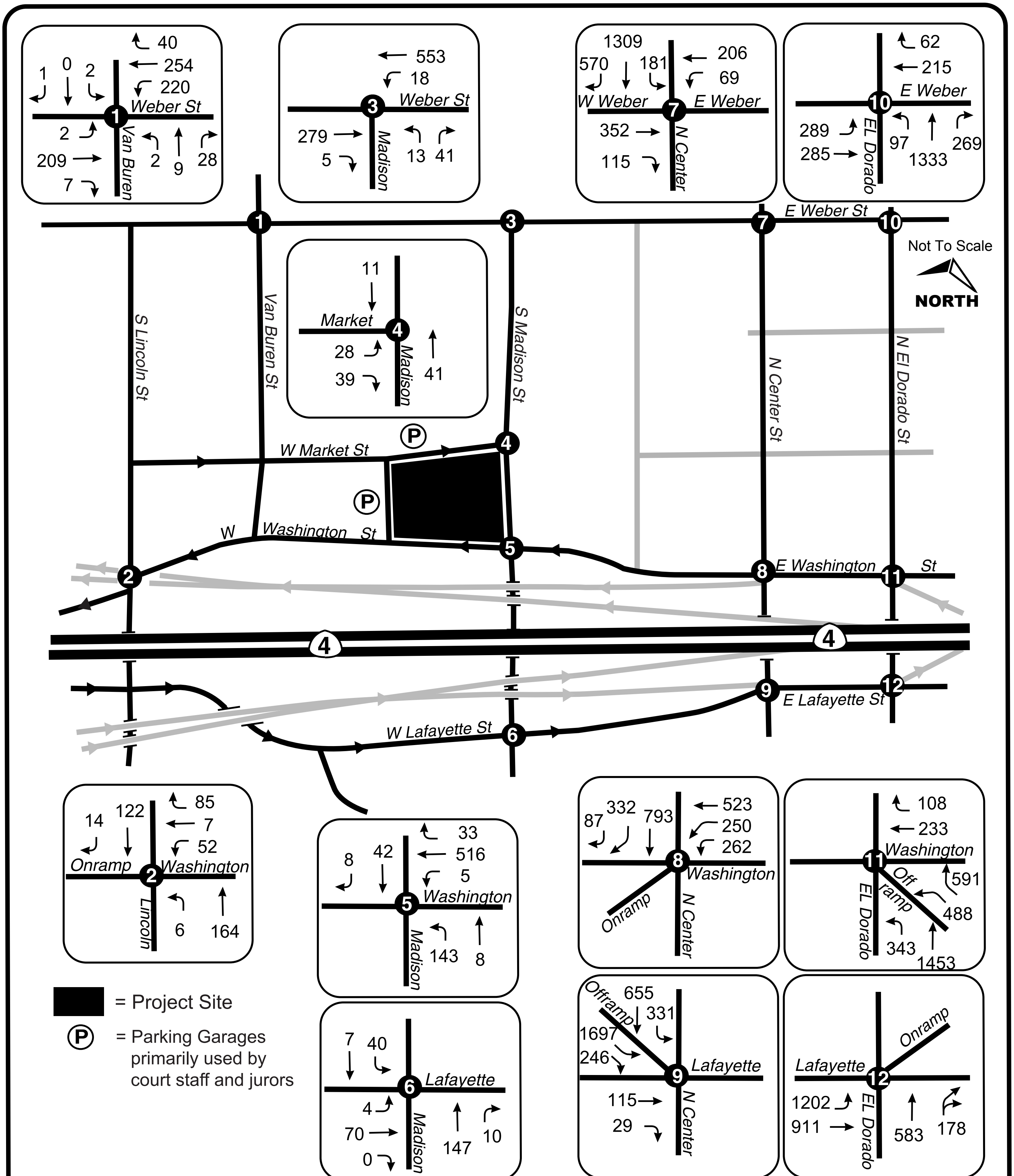
CRANE TRANSPORTATION GROUP

Figure 13
Alternative Site
AM Peak Hour
Project Increment Volumes



CRANE TRANSPORTATION GROUP

Figure 14
Alternative Site
PM Peak Hour
Project Increment Volumes



San Joaquin County Court Traffic Study - Stockton

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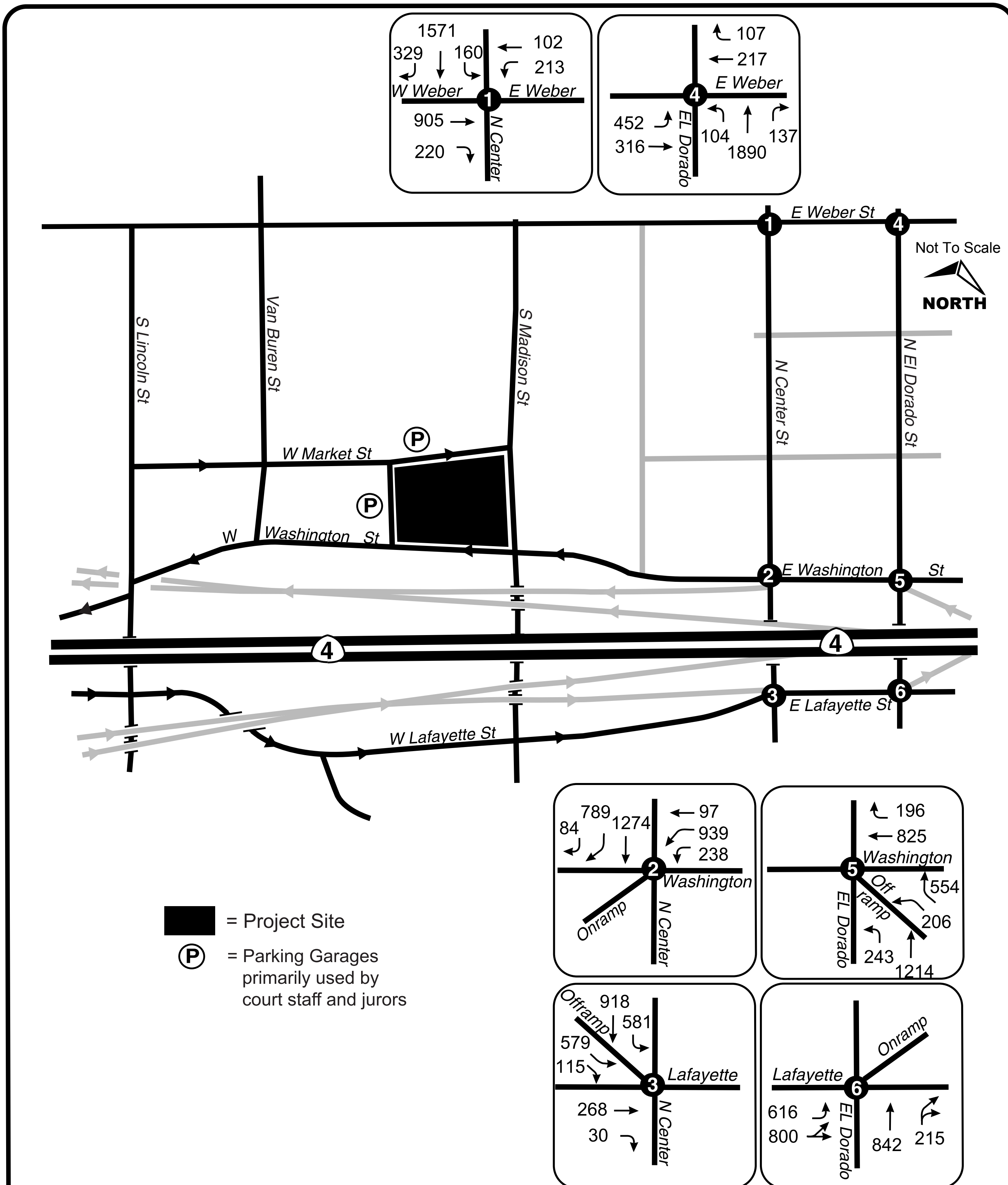
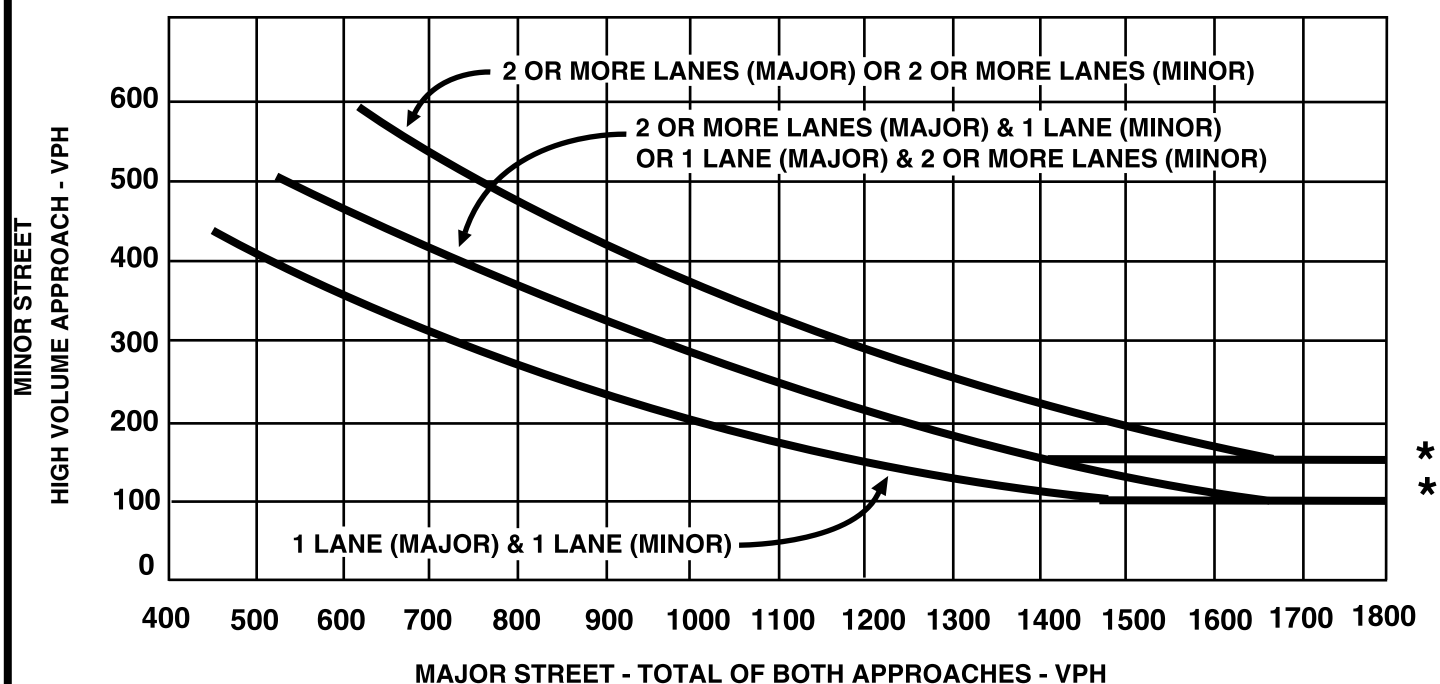
Figure 15
Alternative Site
Year 2013 Base Case + Project
AM Peak Hour Volumes



CRANE TRANSPORTATION GROUP

Figure 16
Alternative Site
Year 2013 Base Case + Project
PM Peak Hour Volumes

PEAK HOUR VOLUME WARRANT #3
(Urban Area)



* **NOTE**

150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE

Source: Year 2003 Manual or Uniform Traffic Control Devices, Federal Highway Administration

TRAFFIC IMPACT STUDY

SAN JOAQUIN COUNTY COURT BUILDING IN STOCKTON, CA TRAFFIC STUDY ADDENDUM

NEAR TERM HORIZON (YEAR 2013) REVISED TRAFFIC ANALYSIS

TECHNICAL APPENDIX

February 26, 2009

Prepared for: AOC

Prepared by: Mark D. Crane, P.E.
California Registered Traffic Engineer (#1381)
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Elk Grove, CA 95758
(916) 647-3406

Table 4 Worksheets

HCM Signalized Intersection Capacity Analysis
1: Park & Center
27/02/2009

Lane Grp Cap (vph)		1544		2319
v/s Ratio Prot		c0.28		c0.29
v/s Ratio Perm				
v/c Ratio		0.62		0.62
Uniform Delay, d1		18.8		17.4
Progression Factor		1.18		1.00
Incremental Delay, d2		1.4		1.2
Delay (s)		23.1		18.7
Level of Service		C		B
Approach Delay (s)	0.0	23.1	0.0	18.7
Approach LOS	A	C	A	B

Intersection Summary

HCM Average Control Delay	20.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	61.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
2: Park & El Dorado
27/02/2009

Intersection Summary: HCM Average Control Delay 9.2, HCM Level of Service A

HCM Signalized Intersection Capacity Analysis
3: Oak & Center
27/02/2009

Intersection Summary: HCM Average Control Delay 5.4, HCM Level of Service A

HCM Signalized Intersection Capacity Analysis
4: Oak & El Dorado
27/02/2009

Intersection Summary: HCM Average Control Delay 5.2, HCM Level of Service A

HCM Signalized Intersection Capacity Analysis
5: Fremont & Center
27/02/2009

Intersection Summary: HCM Average Control Delay 5.1, HCM Level of Service A

HCM Signalized Intersection Capacity Analysis
6: Fremont & El Dorado
27/02/2009

Intersection Summary: HCM Average Control Delay 10.9, HCM Level of Service B

HCM Signalized Intersection Capacity Analysis
7: Weber & Center
27/02/2009

Intersection Summary: HCM Average Control Delay 29.3, HCM Level of Service C

HCM Signalized Intersection Capacity Analysis
8: Weber & El Dorado
27/02/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	[illegible]	[illegible]			[illegible]			[illegible]	[illegible]			
Volume (vph)	409	309	0	0	267	107	104	1920	137	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0			4.0	4.0			
Lane Util. Factor	0.91	0.91			0.95			0.91	1.00			
Frpb, ped/bikes	1.00	1.00			0.99			1.00	0.98			
Flpb, ped/bikes	1.00	1.00			1.00			1.00	1.00			
Frt	1.00	1.00			0.96			1.00	0.85			
Flt Protected	0.95	0.98			1.00			1.00	1.00			
Satd. Flow (prot)	1607	3322			3364			5072	1548			
Flt Permitted	0.42	0.64			1.00			1.00	1.00			
Satd. Flow (perm)	708	2150			3364			5072	1548			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	445	336	0	0	290	116	113	2087	149	0	0	0
RTOR Reduction (vph)	0	0	0	0	16	0	0	0	75	0	0	0
Lane Group Flow (vph)	236	545	0	0	390	0	0	2200	74	0	0	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Turn Type	pm+pt						Split		Perm			
Protected Phases	7	4			8		2	2				
Permitted Phases	4								2			
Actuated Green, G (s)	35.0	35.0			21.0			42.0	42.0			
Effective Green, g (s)	36.0	35.0			21.0			42.0	42.0			
Actuated g/C Ratio	0.41	0.41			0.25			0.49	0.49			
Clearance Time (s)	4.0	4.0			4.0			4.0	4.0			
Lane Grp Cap (vph)	387	1029			831			2506	765			
v/s Ratio Prot	c0.07	0.06			0.12			c0.43				
v/s Ratio Perm	c0.17	0.10							0.05			
v/c Ratio	0.61	0.53			0.47			0.88	0.10			
Uniform Delay, d1	24.2	18.8			27.3			19.2	11.4			
Progression Factor	0.39	0.30			0.93			0.03	0.00			
Incremental Delay, d2	4.1	1.2			1.6			3.3	0.2			
Delay (s)	13.8	7.0			27.1			3.9	0.2			
Level of Service	B	A			C			A	A			
Approach Delay (s)		9.0			27.1			3.8			0.0	
Approach LOS		A			C			A			A	

Intersection Summary			
HCM Average Control Delay	11.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	64.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
9: Weber & California
27/02/2009

[illegible]

Intersection Summary			
HCM Average Control Delay	11.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.21		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	61.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
10: Washington & Center
27/02/2009

[illegible]

Intersection Summary			
HCM Average Control Delay	6.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	73.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
11: Washington & El Dorado
27/02/2009

[illegible]

Intersection Summary			
HCM Average Control Delay	46.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	84.3%	ICU Level of Service	E
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
12: Washington & Stanislaus
27/02/2009

[illegible]

Intersection Summary			
HCM Average Control Delay	17.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	61.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
13: Lafayette & Center
27/02/2009

Movement	EBT	EBR	SBL	SBT	SBR	SBR2
Lane Configurations	[illegible]		[illegible]	[illegible]	[illegible]	
Volume (vph)	90	28	599	920	597	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.9		3.4	3.4	3.4	
Lane Util. Factor	0.91		1.00	0.91	0.94	
Frpb, ped/bikes	0.99		1.00	1.00	0.96	
Flpb, ped/bikes	1.00		1.00	1.00	0.99	
Frt	0.96		1.00	1.00	0.85	
Flt Protected	1.00		0.95	1.00	0.95	
Satd. Flow (prot)	4880		1770	5085	4854	
Flt Permitted	1.00		0.95	1.00	0.95	
Satd. Flow (perm)	4880		1770	5085	4854	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	98	30	651	1000	649	96
RTOR Reduction (vph)	27	0	69	0	0	0
Lane Group Flow (vph)	101	0	582	1000	745	0
Confl. Peds. (#/hr)		10	10		10	10
Turn Type			Prot			
Protected Phases	4		5	2		
Permitted Phases					5	
Actuated Green, G (s)	8.2		46.7	46.7	18.1	
Effective Green, g (s)	8.2		47.3	47.3	18.1	
Actuated g/C Ratio	0.10		0.56	0.56	0.21	
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	482		985	2830	1036	
v/s Ratio Prot	c0.02		c0.32	0.20		
v/s Ratio Perm					c0.15	
v/c Ratio	0.21		0.57	0.35	0.70	
Uniform Delay, d1	36.2		12.3	10.4	30.6	
Progression Factor	1.00		0.25	0.42	1.00	
Incremental Delay, d2	0.2		0.8	0.3	2.0	
Delay (s)	36.5		3.8	4.7	32.6	
Level of Service	D		A	A	C	
Approach Delay (s)	36.5			4.3	32.6	
Approach LOS	D			A	C	

Intersection Summary			
HCM Average Control Delay	14.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	75.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
14: Lafayette & El Dorado
27/02/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	[illegible]	[illegible]						[illegible]				
Volume (vph)	593	678	0	0	0	0	0	842	215	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0						4.0				
Lane Util. Factor	0.86	0.86						0.86				
Frpb, ped/bikes	1.00	1.00						1.00				
Flpb, ped/bikes	1.00	1.00						1.00				
Frt	1.00	1.00						0.97				
Flt Protected	0.95	0.99						1.00				
Satd. Flow (prot)	1527	4736						4842				
Flt Permitted	0.95	0.99						1.00				
Satd. Flow (perm)	1527	4736						4842				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	645	737	0	0	0	0	0	915	234	0	0	0
RTOR Reduction (vph)	33	33	0	0	0	0	0	39	0	0	0	0
Lane Group Flow (vph)	304	1015	0	0	0	0	0	1110	0	0	0	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Turn Type	Split											
Protected Phases	4	4						2				
Permitted Phases												
Actuated Green, G (s)	28.7	28.7						48.3				
Effective Green, g (s)	28.9	28.9						48.9				
Actuated g/C Ratio	0.34	0.34						0.58				
Clearance Time (s)	4.0	4.0						4.0				
Vehicle Extension (s)	3.0	3.0						3.0				
Lane Grp Cap (vph)	517	1610						2856				
v/s Ratio Prot	0.20	c0.21						c0.23				
v/s Ratio Perm												
v/c Ratio	0.59	0.63						0.39				
Uniform Delay, d1	23.1	23.6						9.3				
Progression Factor	1.38	1.32						1.00				
Incremental Delay, d2	1.4	0.7						0.4				
Delay (s)	32.8	31.8						9.8				
Level of Service	C	C						A				
Approach Delay (s)		32.0			0.0			9.6			0.0	
Approach LOS		C			A			A			A	

Intersection Summary			
HCM Average Control Delay	21.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	7.2
Intersection Capacity Utilization	47.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
15: Lafayette & Stanislaus
27/02/2009

Movement	EBL	EBT	EBR	NBT	NBR	SBL	SBT	[illegible]	[illegible]	[illegible]
Lane Configurations		[illegible]		[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	
Volume (vph)	597	73	9	161	53	257	124	229	68	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0		4.0	4.0	4.0	4.0	
Lane Util. Factor		0.95		1.00		1.00	1.00	1.00	1.00	
Frpb, ped/bikes		1.00		0.96		1.00	1.00	1.00	0.96	
Flpb, ped/bikes		1.00		1.00		1.00	1.00	0.99	1.00	
Frt		1.00		0.97		1.00	1.00	1.00	0.85	
Flt Protected		0.96		1.00		0.95	1.00	0.95	1.00	
Satd. Flow (prot)		3341		1780		1770	1863	1745	1488	
Flt Permitted		0.96		1.00		0.95	1.00	0.95	1.00	
Satd. Flow (perm)		3341		1780		1770	1863	1745	1488	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	649	79	10	175	58	279	135	249	74	50
RTOR Reduction (vph)	0	1	0	14	0	0	0	0	28	0
Lane Group Flow (vph)	0	736	0	219	0	279	135	249	96	0
Confl. Peds. (#/hr)	10		10		10	10		10	10	10
Turn Type	Split					Prot			custom	
Protected Phases	4	4		2		1	6			
Permitted Phases								3	3	
Actuated Green, G (s)		20.8		21.4		14.0	39.4	13.0	13.0	
Effective Green, g (s)		20.8		21.4		14.0	39.4	13.0	13.0	
Actuated g/C Ratio		0.24		0.25		0.16	0.46	0.15	0.15	
Clearance Time (s)		4.0		4.0		4.0	4.0	4.0	4.0	
Vehicle Extension (s)		3.0		3.0		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		819		450		292	864	267	228	
v/s Ratio Prot		c0.22		c0.12		c0.16	0.07			
v/s Ratio Perm								c0.14	0.06	
v/c Ratio		1.51dl		0.49		0.96	0.16	0.93	0.42	
Uniform Delay, d1		31.2		27.1		35.2	13.2	35.6	32.8	
Progression Factor		1.00		1.00		0.68	0.70	1.00	1.00	
Incremental Delay, d2		12.6		3.7		39.1	0.1	37.2	1.2	
Delay (s)		43.8		30.8		63.4	9.3	72.8	33.8	
Level of Service		D		C		E	A	E	C	
Approach Delay (s)		43.8		30.8			45.7	58.8		
Approach LOS		D		C			D	E		

Intersection Summary			
HCM Average Control Delay	45.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	96.3%	ICU Level of Service	F
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.
c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1: Park & Center
27/02/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					[illegible]						[illegible]	
Volume (vph)	0	0	0	107	267	0	0	0	0	0	1500	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0						4.0	
Lane Util. Factor					0.95						0.91	
Frpb, ped/bikes					1.00						1.00	
Flpb, ped/bikes					1.00						1.00	
Frt					1.00						0.99	
Flt Protected					0.99						1.00	
Satd. Flow (prot)					3480						5043	
Flt Permitted					0.99						1.00	
Satd. Flow (perm)					3480						5043	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	116	290	0	0	0	0	0	1634	82
RTOR Reduction (vph)	0	0	0	0	12	0	0	0	0	0	6	0
Lane Group Flow (vph)	0	0	0	0	394	0	0	0	0	0	1710	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Turn Type				Split								
Protected Phases				8	8						6	
Permitted Phases												
Actuated Green, G (s)					26.0						51.0	
Effective Green, g (s)					26.0						51.0	
Actuated g/C Ratio					0.31						0.60	
Clearance Time (s)					4.0						4.0	
Lane Grp Cap (vph)					1067						3026	
v/s Ratio Prot					c0.11						c0.34	
v/s Ratio Perm												
v/c Ratio					0.38						0.57	
Uniform Delay, d1					23.0						10.3	
Progression Factor					0.59						1.00	
Incremental Delay, d2					0.3						0.8	
Delay (s)					14.0						11.1	
Level of Service					B						B	
Approach Delay (s)		0.0			14.0			0.0			11.1	
Approach LOS		A			B			A			B	

Intersection Summary			
HCM Average Control Delay	11.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	54.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
2: Park & El Dorado

27/02/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑	↱	↰	↑↑↑				
Volume (vph)	0	0	0	0	263	69	134	1169	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0	4.0	4.0				
Lane Util. Factor					0.95	1.00	0.95	0.91				
Frpb, ped/bikes					1.00	0.98	1.00	1.00				
Flpb, ped/bikes					1.00	1.00	1.00	1.00				
Frt					1.00	0.85	1.00	1.00				
Flt Protected					1.00	1.00	0.95	1.00				
Satd. Flow (prot)					3539	1546	1522	4803				
Flt Permitted					1.00	1.00	0.95	1.00				
Satd. Flow (perm)					3539	1546	1522	4805				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.87
Adj. Flow (vph)	0	0	0	0	286	75	146	1271	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	40	[illegible]	1	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	286	35	77	1270	0	0	0	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Turn Type						Perm	Split					
Protected Phases					4		2	2				
Permitted Phases						4						
Actuated Green, G (s)					27.0	27.0	50.0	50.0				
Effective Green, g (s)					27.0	27.0	50.0	50.0				
Actuated g/C Ratio					0.32	0.32	0.59	0.59				
Clearance Time (s)					4.0	4.0	4.0	4.0				
Lane Grp Cap (vph)					1124	491	895	2825				
v/s Ratio Prot					c0.08		0.05	c0.27				
v/s Ratio Perm						0.02						
v/c Ratio					0.25	0.07	0.09	0.45				
Uniform Delay, d1					21.5	20.3	7.6	9.8				
Progression Factor					1.00	1.00	[illegible]	[illegible]				
Incremental Delay, d2					0.6	0.3	0.3	0.5				
Delay (s)					22.1	20.6	0.2	2.0				
Level of Service					C	C	A	A				
Approach Delay (s)		0.0			21.8			1.9			0.0	
Approach LOS		A			C			A			A	

Intersection Summary			
HCM Average Control Delay	5.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	71.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
3: Oak & Center

27/02/2009

Intersection Summary			
HCM Average Control Delay	8.1	HCM Level of Service	A
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	56.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
4: Oak & El Dorado

27/02/2009

Intersection Summary			
HCM Average Control Delay	4.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	43.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
5: Fremont & Center

27/02/2009

Intersection Summary			
HCM Average Control Delay	5.2	HCM Level of Service	A
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	50.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
6: Fremont & El Dorado

27/02/2009

Intersection Summary			
HCM Average Control Delay	10.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	54.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
7: Weber & Center

27/02/2009

Intersection Summary			
HCM Average Control Delay	11.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	54.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
8: Weber & El Dorado

27/02/2009

Intersection Summary			
HCM Average Control Delay	12.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	64.2%	ICU Level of Service	[illegible]
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
9: Weber & California

27/02/2009

Intersection Summary			
HCM Average Control Delay	13.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	59.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
10: Washington & Center

27/02/2009

Intersection Summary			
HCM Average Control Delay	13.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	7.2
Intersection Capacity Utilization	52.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
11: Washington & El Dorado

27/02/2009

Intersection Summary

HCM Average Control Delay	24.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.6
Intersection Capacity Utilization	77.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
12: Washington & Stanislaus

27/02/2009

Lane Group							
Frt		0.95		1.00	1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00	1.00	1.00
Satd. Flow (prot)		3268		1770	1863	1863	1520
Flt Permitted		1.00		0.95	1.00	1.00	1.00
Satd. Flow (perm)		3268		1770	1863	1863	1520
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	80	870	423	199	833	128	34
RTOR Reduction (vph)	0	97	0	0	4	0	0
Lane Group Flow (vph)	0	1076	0	199	833	128	34
Confl. Peds. (#/hr)	10		10	10			10
Turn Type	Split			Prot			Perm
Protected Phases	8	8		5	2	6	
Permitted Phases							6
Actuated Green, G (s)		32.6		15.0	44.4	25.4	25.4
Effective Green, g (s)		33.5		15.0	44.8	25.8	25.8
Actuated g/C Ratio		0.39		0.18	0.52	0.30	0.30
Clearance Time (s)		4.0		4.0	4.8	4.8	4.8
Vehicle Extension (s)		3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		1289		312	978	561	458
v/s Ratio Prot		c0.33		0.11	c0.29	0.07	
v/s Ratio Perm							0.02
v/c Ratio		0.83		0.64	0.54	0.22	0.07
Uniform Delay, d1		23.2		32.5	13.4	22.3	21.2
Progression Factor		1.00		0.81	0.72	1.00	1.00
Incremental Delay, d2		4.7		4.2	2.2	0.9	0.3
Delay (s)		27.9		30.8	11.8	23.2	21.5
Level of Service		C		C	B	C	C
Approach Delay (s)		27.9			15.3	22.8	
Approach LOS		C			B	C	

Intersection Summary

HCM Average Control Delay	23.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.9
Intersection Capacity Utilization	77.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
13: Lafayette & Center

27/02/2009

Lane Group						
Volume (vph)	33	28	336?	655?	1616?	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.8		3.4	3.4	3.4	
Lane Util. Factor	0.91		1.00	0.91	0.91	
Frpb, ped/bikes	0.98		1.00	1.00	1.00	
Flpb, ped/bikes	1.00		1.00	1.00	0.98	
Frt	0.96		1.00	1.00	0.98	
Flt Protected	1.00		0.95	1.00	0.98	
Satd. Flow (prot)	4867		1770	5085	4891	
Flt Permitted	1.00		0.95	1.00	0.94	
Satd. Flow (perm)	4867		1770	5085	4891	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	38	30	365	712	1758	143
RTOR Reduction (vph)	28	0	15	0	0	0
Lane Group Flow (vph)	38	0	350	712	1907	0
Confl. Peds. (#/hr)		10	10		10	10
Turn Type			Prot			
Protected Phases	4		5	2		
Permitted Phases					2	
Actuated Green, G (s)	6.0		33.8	33.0	34.0	
Effective Green, g (s)	6.2		33.8	33.6	34.8	
Actuated g/C Ratio	0.07		0.40	0.40	0.41	
Clearance Time (s)	4.0		4.0	4.5	4.0	
Lane Grp Cap (vph)	355		700	2010	1991	
v/s Ratio Prot	c0.02		c0.20	0.14		
v/s Ratio Perm					c0.39	
v/c Ratio	0.28		0.50	0.35	0.96	
Uniform Delay, d1	37.2		19.4	18.1	24.4	
Progression Factor	1.00		0.58	0.56	1.00	
Incremental Delay, d2	1.6		2.4	0.5	12.1	
Delay (s)	39.8		13.8	10.6	36.6	
Level of Service	D		B	B	D	
Approach Delay (s)	38.8			11.6	36.5	
Approach LOS	D			B	D	

Intersection Summary

HCM Average Control Delay	28.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	10.8
Intersection Capacity Utilization	83.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
14: Lafayette & El Dorado

27/02/2009

Intersection Summary

HCM Average Control Delay	9.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	7.2
Intersection Capacity Utilization	81.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
15: Lafayette & Stanislaus

27/02/2009

Intersection Summary

HCM Average Control Delay	47.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	81.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1: Park & Center

27/02/2009

Intersection Summary

HCM Average Control Delay	12.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	55.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
2: Park & El Dorado

27/02/2009

Intersection Summary

HCM Average Control Delay	5.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	71.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: Oak & Center

27/02/2009

Intersection Summary

HCM Average Control Delay	8.1	HCM Level of Service	A
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	54.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
4: Oak & El Dorado

27/02/2009

Intersection Summary

HCM Average Control Delay	4.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	85.5	Sum of lost time (s)	8.0
Intersection Capacity Utilization	43.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
5: Fremont & Center
27/02/2009

[illegible]

Intersection Summary

HCM Average Control Delay	5.2	HCM Level of Service	A
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	61.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
6: Fremont & El Dorado
27/02/2009

[illegible]

Intersection Summary

HCM Average Control Delay	10.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	54.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
7: Weber & Center
27/02/2009

[illegible]

Intersection Summary

HCM Average Control Delay	11.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	54.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
8: Weber & El Dorado
27/02/2009

[illegible]

Intersection Summary

HCM Average Control Delay	12.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	54.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
9: Weber & California
27/02/2009

[illegible]

Intersection Summary

HCM Average Control Delay	13.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.19		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	61.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
10: Washington & Center
27/02/2009

[illegible]

Intersection Summary

HCM Average Control Delay	13.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	7.2
Intersection Capacity Utilization	50.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
11: Washington & El Dorado
27/02/2009

[illegible]

Intersection Summary

HCM Average Control Delay	28.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	9.6
Intersection Capacity Utilization	84.5%	ICU Level of Service	E
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
12: Washington & Stanislaus
27/02/2009

[illegible]

Intersection Summary

HCM Average Control Delay	24.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	85.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
13: Lafayette & Center
27/02/2009

[illegible]

Intersection Summary

HCM Average Control Delay	45.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	10.6
Intersection Capacity Utilization	87.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
14: Lafayette & El Dorado
27/02/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1309	904	0	0	0	0	0	585	178	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.8	3.8						3.4				
Lane Util. Factor	0.95	0.86						0.95				
Frpb, ped/bikes	1.00	1.00						0.99				
Flpb, ped/bikes	1.00	1.00						1.00				
Frt	1.00	1.00						0.97				
Flt Protected	0.95	0.96						1.00				
Satd. Flow (prot)	1622	4707						5150				
Flt Permitted	0.95	1.00						1.00				
Satd. Flow (perm)	1622	4707						5150				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1423	983	0	0	0	0	0	636	193	0	0	0
RTOR Reduction (vph)	76	76	0	0	0	0	0	38	0	0	0	0
Lane Group Flow (vph)	635	1619	0	0	0	0	0	796	0	0	0	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Turn Type	Split											
Protected Phases	4	4						2				
Permitted Phases												
Actuated Green, G (s)	41.0	41.0						36.0				
Effective Green, g (s)	41.2	41.2						36.6				
Actuated g/C Ratio	0.48	0.48						0.43				
Clearance Time (s)	4.0	4.0						4.0				
Lane Grp Cap (vph)	736	2282						2646				
v/s Ratio Prot	c0.42	0.34						c0.15				
v/s Ratio Perm												
v/c Ratio	0.86	0.71						0.30				
Uniform Delay, d1	19.4	17.2						15.8				
Progression Factor	0.36	0.34						1.00				
Incremental Delay, d2	4.5	0.8						0.3				
Delay (s)	11.5	6.4						16.1				
Level of Service	B	A						B				
Approach Delay (s)		7.9			0.0			16.1			0.0	
Approach LOS		A			A			B			A	

Intersection Summary

HCM Average Control Delay	10.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	7.2
Intersection Capacity Utilization	67.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
15: Lafayette & Stanislaus
27/02/2009

Movement										
Lane Configurations										
Volume (vph)	132	10	[illegible]	116	[illegible]	135	60	523	114	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0		4.0	4.0	4.0	4.0	
Lane Util. Factor		0.95		1.00		1.00	1.00	1.00	1.00	
Frpb, ped/bikes		1.00		0.99		1.00	1.00	1.00	0.96	
Flpb, ped/bikes		1.00		1.00		1.00	1.00	0.99	1.00	
Frt		0.99		0.97		1.00	1.00	1.00	0.85	
Flt Protected		0.96		1.00		0.95	1.00	0.95	1.00	
Satd. Flow (prot)		3358		1790		1779	1863	1748	1480	
Flt Permitted		0.96		1.00		0.95	1.00	0.95	1.00	
Satd. Flow (perm)		3358		1790		1779	1863	1746	1480	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	143	11	8	126	41	147	65	558	124	20
RTOR Reduction (vph)	0	5	0	14	0	0	0	0	0	0
Lane Group Flow (vph)	0	157	0	131	0	147	65	568	144	0
Confl. Peds. (#/hr)	10		10		10	10		10	10	10
Turn Type	Split					Prot			custom	
Protected Phases	4	4		2		1	6			
Permitted Phases								3	3	
Actuated Green, G (s)		11.1		22.0		6.0	32.0	29.9	29.9	
Effective Green, g (s)		11.1		22.0		5.8	32.0	29.9	29.9	
Actuated g/C Ratio		0.13		0.26		0.07	0.38	0.35	0.35	
Clearance Time (s)		4.0		4.0		4.0	4.0	4.0	4.0	
Vehicle Extension (s)		3.0		3.0		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		439		463		125	701	615	524	
v/s Ratio Prot		c0.05		c0.08		c0.08	0.03			
v/s Ratio Perm								c0.32	0.10	
v/c Ratio		0.36		0.33		1.18	0.09	0.92	0.27	
Uniform Delay, d1		33.7		25.5		39.5	17.1	26.5	19.8	
Progression Factor		1.00		1.00		0.56	0.41	1.00	1.00	
Incremental Delay, d2		0.5		1.9		131.4	0.1	19.6	0.3	
Delay (s)		34.2		27.4		153.0	7.1	46.1	20.0	
Level of Service		C		C		F	A	D	C	
Approach Delay (s)		34.2		27.4			106.3	40.6		
Approach LOS		C		C			F	D		

Intersection Summary

HCM Average Control Delay	49.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	82.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1: Park & Center
27/02/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Satd. Flow (prot)		3503									5286	
Satd. Flow (perm)		3503									5286	
Lane Grp Cap (vph)		1546									2310	
[illegible]												

Intersection Summary

HCM Average Control Delay	20.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	61.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
2: Park & El Dorado
27/02/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Grp Cap (vph)					1082	672	913	2581				
Uniform Delay, d1					24.8	22.7	8.5	11.5				
Incremental Delay, d2					2.2	1.8	0.9	1.2				
[illegible]												

Intersection Summary

HCM Average Control Delay	5.1	HCM Level of Service	A
HCM Volume to Capacity ratio	[illegible]		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	[illegible]	ICU Level of Service	[illegible]
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: Oak & Center
27/02/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated Green, G (s)		27.8	86.0								[illegible]	
Lane Grp Cap (vph)		1124	1560								[illegible]	
Uniform Delay, d1		21.3	0.0								[illegible]	
Incremental Delay, d2		0.5	0.1								[illegible]	
[illegible]												

Intersection Summary

HCM Average Control Delay	5.4	HCM Level of Service	A
HCM Volume to Capacity ratio	[illegible]		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	[illegible]	ICU Level of Service	[illegible]
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
4: Oak & El Dorado
27/02/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
[illegible]												

Intersection Summary

HCM Average Control Delay	5.1	HCM Level of Service	A
HCM Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	[illegible]	ICU Level of Service	[illegible]
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
5: Fremont & Center
27/02/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	77	216	39	306	5	0	0	0	10	1213	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0						4.0	
Lane Util. Factor		1.00	1.00		0.95						0.86	
Frpb, ped/bikes		1.00	0.99		1.00						1.00	
Flpb, ped/bikes		1.00	1.00		1.00						1.00	
Frt		1.00	0.85		1.00						1.00	
Flt Protected		1.00	1.00		0.99						1.00	
Satd. Flow (prot)		1863	1580		3413						6387	
Flt Permitted		1.00	1.00		0.92						1.00	
Satd. Flow (perm)		1863	1580		3243						6387	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	84	234	42	333	5	0	0	0	11	1318	22
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	84	234	0	375	0	0	0	0	0	1348	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Turn Type			Free	Perm						Split		
Protected Phases		4			8					6	6	
Permitted Phases			Free	8								
Actuated Green, G (s)		33.0	86.0		33.0						44.0	
Effective Green, g (s)		33.0	86.0		33.0						44.0	
Actuated g/C Ratio		0.38	1.00		0.38						0.52	
Clearance Time (s)		4.0			4.0						4.0	
Lane Grp Cap (vph)		723	1580		1259						3306	
v/s Ratio Prot		0.05									c0.21	
v/s Ratio Perm			0.15		c0.12							
v/c Ratio		0.12	0.16		0.30						0.41	
Uniform Delay, d1		16.7	0.0		18.8						12.5	
Progression Factor		1.00	1.00		0.48						0.31	
Incremental Delay, d2		0.3	0.2		0.5						0.3	
Delay (s)		17.0	0.2		9.5						4.2	
Level of Service		B	A		A						A	
Approach Delay (s)		4.6			9.1			0.0			4.2	
Approach LOS		A			A			A			A	

Intersection Summary

HCM Average Control Delay	5.2	HCM Level of Service	A
HCM Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	43.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
6: Fremont & El Dorado
27/02/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	76	30	0	0	291	122	60	1834	89	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0				
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95				
Frpb, ped/bikes	1.00	1.00			0.98		1.00	1.00				
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00				
Frt	1.00	1.00			0.96		1.00	0.99				
Flt Protected	0.95	1.00			1.00		0.95	1.00				
Satd. Flow (prot)	1781	1863			1778		1770	5354				
Flt Permitted	0.34	1.00			1.00		0.95	1.00				
Satd. Flow (perm)	628	1863			1778		1770	5354				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	82	33	0	0	316	133	64	1993	95	0	0	0
RTOR Reduction (vph)	0	0	0	0	2	0	0	4	0	0	0	0
Lane Group Flow (vph)	82	33	0	0	448	0	64	2079	0	0	0	0
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Turn Type	Perm						Split					
Protected Phases		4			4		2	2				
Permitted Phases	4											
Actuated Green, G (s)	37.0	37.0			37.0		40.0	40.0				
Effective Green, g (s)	37.0	37.0			37.0		40.0	40.0				
Actuated g/C Ratio	0.44	0.44			0.44		0.47	0.47				
Clearance Time (s)	4.0	4.0			4.0		4.0	4.0				
Lane Grp Cap (vph)	273	811			773		833	2990				
v/s Ratio Prot		0.02			c0.25		0.03	c0.37				
v/s Ratio Perm	0.13											
v/c Ratio	0.30	0.04			0.58		0.08	0.70				
Uniform Delay, d1	15.6	13.8			18.1		12.3	17.7				
Progression Factor	0.56	0.55			1.00		0.45	0.45				
Incremental Delay, d2	2.8	0.1			3.2		0.1	0.7				
Delay (s)	11.5	7.7			21.3		5.6	8.7				
Level of Service	B	A			C		A	A				
Approach Delay (s)		10.4			21.3			8.6			0.0	
Approach LOS		B			C			A			A	

Intersection Summary

HCM Average Control Delay	10.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	65.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
7: Weber & Center
27/02/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	865	120	337	101	0	0	0	0	160	1571	322
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0					4.0	4.0	4.0
Lane Util. Factor		0.95		0.91	0.91					1.00	0.91	1.00
Frpb, ped/bikes		1.00		1.00	1.00					1.00	1.00	0.98
Flpb, ped/bikes		1.00		1.00	1.00					1.00	1.00	1.00
Frt		0.98		1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00		0.95	0.97					0.95	1.00	1.00
Satd. Flow (prot)		3464		1610	3204					1770	5085	1546
Flt Permitted		1.00		0.12	0.60					0.95	1.00	1.00
Satd. Flow (perm)		3464		199	2031					1770	5085	1546
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	929	130	366	110	0	0	0	0	174	1708	350
RTOR Reduction (vph)	0	13	0	0	0	0	0	0	0	0	0	210
Lane Group Flow (vph)	0	1046	0	183	293	0	0	0	0	174	1708	140
Confl. Peds. (#/hr)	10		10	10		10	10		10	10		10
Turn Type				pm+pt						Split		Perm
Protected Phases		4		3	8					6	6	
Permitted Phases				8								6
Actuated Green, G (s)		30.0		43.0	43.0					34.0	34.0	34.0
Effective Green, g (s)		30.0		43.0	43.0					34.0	34.0	34.0
Actuated g/C Ratio		0.35		0.51	0.51					0.40	0.40	0.40
Clearance Time (s)		4.0		4.0	4.0					4.0	4.0	4.0
Lane Grp Cap (vph)		1223		250	1181					708	2034	618
v/s Ratio Prot		c0.30		c0.08	0.03					0.10	c0.34	
v/s Ratio Perm				0.29	0.10							0.09
v/c Ratio		0.86		0.73	0.25					0.25	0.84	0.23
Uniform Delay, d1		25.5		19.5	11.9					17.5	23.0	16.8
Progression Factor		1.00		2.19	0.75					0.47	0.58	0.00
Incremental Delay, d2		7.8		13.5	0.4					0.8	4.3	0.8
Delay (s)		33.3		48.5	9.3					8.8	17.8	0.8
Level of Service		C		D	A					A	B	A
Approach Delay (s)		33.3			24.7			0.0			14.5	
Approach LOS		C			C			A			B	

Intersection Summary

HCM Average Control Delay	21.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	64.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
8: Weber & El Dorado
27/02/2009

2013 PM Peak Hour 19/02/2009 Base Case + Project
%user_name%
Synchro 7 - Report
Page 8

HCM Signalized Intersection Capacity Analysis
9: Weber & California
27/02/2009

2013 PM Peak Hour 19/02/2009 Base Case + Project
%user_name%
Synchro 7 - Report
Page 9

HCM Signalized Intersection Capacity Analysis
10: Washington & Center
27/02/2009

2013 PM Peak Hour 19/02/2009 Base Case + Project
%user_name%
Synchro 7 - Report
Page 10

HCM Signalized Intersection Capacity Analysis
11: Washington & El Dorado
27/02/2009

2013 PM Peak Hour 19/02/2009 Base Case + Project
%user_name%
Synchro 7 - Report
Page 11

HCM Signalized Intersection Capacity Analysis
12: Washington & Stanislaus
27/02/2009

2013 PM Peak Hour 19/02/2009 Base Case + Project
%user_name%
Synchro 7 - Report
Page 12

HCM Signalized Intersection Capacity Analysis
13: Lafayette & Center
27/02/2009

2013 PM Peak Hour 19/02/2009 Base Case + Project
%user_name%
Synchro 7 - Report
Page 13

HCM Signalized Intersection Capacity Analysis
14: Lafayette & El Dorado
27/02/2009

2013 PM Peak Hour 19/02/2009 Base Case + Project
%user_name%
Synchro 7 - Report
Page 14

HCM Signalized Intersection Capacity Analysis
15: Lafayette & Stanislaus
27/02/2009

2013 PM Peak Hour 19/02/2009 Base Case + Project
%user_name%
Synchro 7 - Report
Page 15

Table 5 Worksheets

Please disregard worksheets for intersections 9 (Weber/California), 12 (Washington/Stanislaus) and 15 (Lafayette/Stanislaus) as they have not been incorporated into this traffic report.

Queues
1: Park & Center
27/02/2009

Lane Group	[illegible]	[illegible]
Lane Group Flow (vph)	406	1716
v/c Ratio	0.32	0.57
Control Delay	14.1	11.5
Queue Delay	0.0	0.0
Total Delay	14.1	11.5
Queue Length 50th (ft)	45	183
Queue Length 95th (ft)	71	223
Internal Link Dist (ft)	331	466
Turn Bay Length (ft)		
Base Capacity (vph)	1085	3033
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.37	0.57

Intersection Summary

Queues
2: Park & El Dorado
27/02/2009

Lane Group	[illegible]	[illegible]	[illegible]	[illegible]
Lane Group Flow (vph)	294	75	121	1286
v/c Ratio	0.25	0.14	0.16	0.40
Control Delay	22.3	9.0	0.3	7.5
Queue Delay	0.0	0.0	0.0	0.3
Total Delay	22.3	9.0	0.3	7.1
Queue Length 50th (ft)	58	6	0	197
Queue Length 95th (ft)	98	36	0	22
Internal Link Dist (ft)	354			500
Turn Bay Length (ft)				
Base Capacity (vph)	1124	530	949	3325
Starvation Cap Reductn	0	0	0	72
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.26	0.14	0.14	0.47

Intersection Summary

Queues
3: Oak & Center
27/02/2009

Lane Group	[illegible]	[illegible]	[illegible]
Lane Group Flow (vph)	138	172	1822
v/c Ratio	0.40	0.11	0.54
Control Delay	24.0	0.2	4.6
Queue Delay	0.0	0.0	0.1
Total Delay	24.0	0.2	4.7
Queue Length 50th (ft)	57	0	52
Queue Length 95th (ft)	140	0	57
Internal Link Dist (ft)	381		251
Turn Bay Length (ft)			
Base Capacity (vph)	1124	1540	2591
Starvation Cap Reductn	0	0	183
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.40	0.11	0.55

Intersection Summary

Queues
4: Oak & El Dorado
27/02/2009

Lane Group	[illegible]	[illegible]
Lane Group Flow (vph)	542	1426
v/c Ratio	0.38	0.45
Control Delay	6.8	3.5
Queue Delay	0.0	0.0
Total Delay	6.8	3.5
Queue Length 50th (ft)	33	34
Queue Length 95th (ft)	45	38
Internal Link Dist (ft)	312	323
Turn Bay Length (ft)		
Base Capacity (vph)	1443	3136
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.38	0.45

Intersection Summary

Queues
5: Fremont & Center
27/02/2009

Lane Group	[illegible]	[illegible]	[illegible]	[illegible]
Lane Group Flow (vph)	215	314	166	1829
v/c Ratio	0.34	0.20	0.15	0.51
Control Delay	22.7	0.3	15.6	3.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	22.7	0.3	15.6	3.2
Queue Length 50th (ft)	64	0	38	30
Queue Length 95th (ft)	142	0	82	34
Internal Link Dist (ft)	352		351	335
Turn Bay Length (ft)				
Base Capacity (vph)	838	1580	1101	3806
Starvation Cap Reductn	0	0	0	271
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.34	0.20	0.15	0.55

Intersection Summary

Queues
6: Fremont & El Dorado
27/02/2009

Lane Group	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Lane Group Flow (vph)	180	81	157	43	1295
v/c Ratio	0.34	0.11	0.19	0.05	0.44
Control Delay	11.5	8.9	13.4	5.1	9.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	11.5	8.9	13.4	5.1	9.8
Queue Length 50th (ft)	31	15	43	5	138
Queue Length 95th (ft)	61	29	81	m12	140
Internal Link Dist (ft)		311	304		1438
Turn Bay Length (ft)					
Base Capacity (vph)	536	833	819	842	2916
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	0.34	0.11	0.19	0.05	0.44

Intersection Summary

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

Queues
7: Weber & Center
27/02/2009

Lane Group	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Lane Group Flow (vph)	472	61	157	197	1397	511
v/c Ratio	0.48	0.17	0.12	0.23	0.57	0.51
Control Delay	24.6	14.9	15.7	2.9	5.8	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.9	15.9	15.7	3.3	5.8	3.2
Queue Length 50th (ft)	86	19	26	29	91	3
Queue Length 95th (ft)	144	m35	m38	38	117	53
Internal Link Dist (ft)	903		332		1410	
Turn Bay Length (ft)						
Base Capacity (vph)	992	364	1321	854	2403	1010
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	0.48	0.17	0.12	0.23	0.57	0.51

Intersection Summary

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

Queues
8: Weber & El Dorado
27/02/2009

Lane Group	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Lane Group Flow (vph)	190	416	219	1619	292
v/c Ratio	0.41	0.34	0.25	0.06	0.33
Control Delay	12.5	10.2	14.0	13.7	1.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	12.5	10.2	14.0	13.7	1.5
Queue Length 50th (ft)	47	61	33	134	4
Queue Length 95th (ft)	75	70	61	148	m17
Internal Link Dist (ft)		332	1479	1061	
Turn Bay Length (ft)					
Base Capacity (vph)	464	1217	876	2445	898
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	0.41	0.34	0.25	0.66	0.33

Intersection Summary

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

Queues
9: Weber & California
27/02/2009

Lane Group	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Lane Group Flow (vph)	51	142	17	253	233	344
v/c Ratio	0.11	0.10	0.03	0.18	0.15	0.22
Control Delay	12.3	7.7	15.3	12.6	11.5	10.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.3	7.7	15.3	12.6	11.5	10.4
Queue Length 50th (ft)	10	4	3	33	32	42
Queue Length 95th (ft)	26	17	16	57	52	67
Internal Link Dist (ft)		1479		823	315	675
Turn Bay Length (ft)						
Base Capacity (vph)	453	1486	583	1435	1591	1560
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	0.10	0.03	0.18	0.15	0.22

Intersection Summary

Queues
10: Washington & Center

27/02/2009

Lane Group					
Lane Group Flow (vph)	162	385	179	997	286
v/c Ratio	0.28	0.32	0.15	0.37	0.37
Control Delay	14.8	26.2	28.2	2.4	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	14.9	26.2	29.2	2.4	2.4
Queue Length 50th (ft)	30	82	45	13	0
Queue Length 95th (ft)	m80	m125	m64	22	12
Internal Link Dist (ft)			348	1162	
Turn Bay Length (ft)					
Base Capacity (vph)	646	1151	1216	2684	768
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	0.25	0.32	0.15	0.37	0.37

Intersection Summary

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

Queues
11: Washington & El Dorado

27/02/2009

Lane Group				
Lane Group Flow (vph)	345	1848	641	332
v/c Ratio	0.75	0.58	0.72	0.88
Control Delay	27.6	15.1	34.4	55.4
Queue Delay	0.0	0.2	0.0	0.0
Total Delay	27.6	15.3	34.4	55.4
Queue Length 50th (ft)	92	264	180	185
Queue Length 95th (ft)	m119	233	221	#351
Internal Link Dist (ft)	2284	345	781	
Turn Bay Length (ft)				
Base Capacity (vph)	483	3109	888	379
Starvation Cap Reductn	0	458	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.71	0.70	0.72	0.88

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
12: Washington & Stanislaus

27/02/2009

Lane Group					
Lane Group Flow (vph)	1173	198	530	126	34
v/c Ratio	0.86	0.64	0.56	0.22	0.07
Control Delay	20.3	36.5	12.8	24.7	23.6
Queue Delay	0.0	0.0	0.6	0.3	0.0
Total Delay	20.3	36.5	13.3	24.7	23.6
Queue Length 50th (ft)	247	92	158	52	13
Queue Length 95th (ft)	326	#146	251	97	35
Internal Link Dist (ft)	553		341	1109	
Turn Bay Length (ft)					
Base Capacity (vph)	1462	312	976	562	458
Starvation Cap Reductn	0	0	171	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.79	0.64	0.66	0.22	0.07

Intersection Summary

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

Queues
13: Lafayette & Center

27/02/2009

Lane Group				
Lane Group Flow (vph)	120	385	712	1902
v/c Ratio	0.34	0.81	0.36	0.56
Control Delay	30.3	13.2	10.7	37.4
Queue Delay	0.0	0.3	0.0	0.7
Total Delay	30.3	13.6	10.7	38.1
Queue Length 50th (ft)	16	17	64	42
Queue Length 95th (ft)	35	181	65	#453
Internal Link Dist (ft)	565		386	632
Turn Bay Length (ft)				
Base Capacity (vph)	365	745	2016	3382
Starvation Cap Reductn	0	79	0	0
Spillback Cap Reductn	0	0	0	36
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.33	0.86	0.35	0.57

Intersection Summary

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

Queues
14: Lafayette & El Dorado

27/02/2009

Lane Group			
Lane Group Flow (vph)	605	1577	920
v/c Ratio	0.74	0.57	0.31
Control Delay	7.5	8.7	14.8
Queue Delay	0.2	1.2	0.0
Total Delay	12.6	9.9	14.8
Queue Length 50th (ft)	92	112	74
Queue Length 95th (ft)	m75	m113	96
Internal Link Dist (ft)		302	252
Turn Bay Length (ft)			
Base Capacity (vph)	815	2761	2950
Starvation Cap Reductn	158	517	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.81	0.38	0.31

Intersection Summary

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

Queues
15: Lafayette & Stanislaus

27/02/2009

Lane Group						
Lane Group Flow (vph)	180	165	141	65	668	132
v/c Ratio	0.38	0.35	1.13	0.09	0.92	0.29
Control Delay	33.3	25.0	143.8	7.3	51.8	21.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.3	25.0	143.8	7.3	51.8	21.8
Queue Length 50th (ft)	41	40	~100	10	278	30
Queue Length 95th (ft)	80	118	m#158	m16	#603	120
Internal Link Dist (ft)	650	312		341	646	
Turn Bay Length (ft)						
Base Capacity (vph)	434	477	125	701	618	533
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	0.35	1.13	0.09	0.92	0.25

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
1: Park & Center

27/02/2009

Lane Group		
Lane Group Flow (vph)	411	1794
v/c Ratio	0.38	0.59
Control Delay	14.4	11.4
Queue Delay	0.0	0.0
Total Delay	14.4	11.4
Queue Length 50th (ft)	60	184
Queue Length 95th (ft)	73	235
Internal Link Dist (ft)	331	465
Turn Bay Length (ft)		
Base Capacity (vph)	1085	3002
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.38	0.59

Intersection Summary

Queues
2: Park & El Dorado

27/02/2009

Lane Group				
Lane Group Flow (vph)	298	75	132	1294
v/c Ratio	0.26	0.14	0.14	0.46
Control Delay	27.3	9.2	0.3	2.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	27.3	9.2	0.3	2.1
Queue Length 50th (ft)	80	7	0	14
Queue Length 95th (ft)	91	36	0	27
Internal Link Dist (ft)	334			300
Turn Bay Length (ft)				
Base Capacity (vph)	1126	538	950	2825
Starvation Cap Reductn	0	0	0	72
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.26	0.14	0.14	0.47

Intersection Summary

Queues
3: Oak & Center

27/02/2009

Lane Group			
Lane Group Flow (vph)	452	140	1650
v/c Ratio	0.40	0.12	0.52
Control Delay	24.0	0.2	4.7
Queue Delay	0.0	0.0	0.1
Total Delay	24.0	0.2	4.8
Queue Length 50th (ft)	88	0	54
Queue Length 95th (ft)	141	0	60
Internal Link Dist (ft)	301		291
Turn Bay Length (ft)			
Base Capacity (vph)	1126	1166	2960
Starvation Cap Reductn	0	0	142
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.40	0.12	0.55

Intersection Summary

4: Oak & El Dorado

Lane Group	[illegible]	[illegible]
Lane Group Flow (vph)	590	1435
v/c Ratio	0.39	0.46
Control Delay	6.5	3.5
Queue Delay	0.0	0.0
Total Delay	6.5	3.5
Queue Length 50th (ft)	33	34
Queue Length 95th (ft)	45	38
Internal Link Dist (ft)	318	323
Turn Bay Length (ft)		
Base Capacity (vph)	1483	3130
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.39	0.46

Intersection Summary

5: Fremont & Center

Lane Group	[illegible]	[illegible]	[illegible]	[illegible]
Lane Group Flow (vph)	329	320	147	1964
v/c Ratio	0.39	0.35	0.15	0.53
Control Delay	22.5	0.3	15.9	3.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	22.5	0.3	15.9	3.2
Queue Length 50th (ft)	87	0	39	31
Queue Length 95th (ft)	145	0	62	34
Internal Link Dist (ft)	352		311	333
Turn Bay Length (ft)				
Base Capacity (vph)	838	1580	1101	3655
Starvation Cap Reductn	0	0	0	246
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.39	0.20	0.13	0.57

Intersection Summary

6: Fremont & El Dorado

Lane Group	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Lane Group Flow (vph)	190	96	157	41	1705
v/c Ratio	0.34	0.12	0.19	0.05	0.45
Control Delay	11.6	9.2	13.4	5.8	9.3
Queue Delay	0.0	0.0	0.0	0.3	0.0
Total Delay	11.6	9.2	13.4	6.1	9.3
Queue Length 50th (ft)	31	16	43	8	138
Queue Length 95th (ft)	41	32	41	m12	135
Internal Link Dist (ft)		311	334		1418
Turn Bay Length (ft)					
Base Capacity (vph)	536	833	819	812	3816
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	0.34	0.12	0.19	0.08	0.45

Intersection Summary

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

7: Weber & Center

Lane Group	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Lane Group Flow (vph)	475	86	185	197	1452	511
v/c Ratio	0.45	0.15	0.13	0.23	0.58	0.51
Control Delay	24.8	16.1	14.8	3.7	5.9	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.8	16.1	14.8	3.7	5.9	3.1
Queue Length 50th (ft)	96	20	25	19	72	7
Queue Length 95th (ft)	144	m35	m37	34	123	46
Internal Link Dist (ft)	993		302		1410	
Turn Bay Length (ft)						
Base Capacity (vph)	992	383	1288	854	2453	1010
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	0.46	0.18	0.15	0.23	0.59	0.51

Intersection Summary

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

8: Weber & El Dorado

Lane Group	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Lane Group Flow (vph)	147	419	232	1873	313
v/c Ratio	0.41	0.36	0.26	0.59	0.35
Control Delay	12.3	10.2	14.5	13.3	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	12.3	10.2	14.5	13.3	1.7
Queue Length 50th (ft)	46	52	38	142	5
Queue Length 95th (ft)	74	79	65	m178	m17
Internal Link Dist (ft)		302	1479	1061	
Turn Bay Length (ft)					
Base Capacity (vph)	453	1180	878	3446	907
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	0.41	0.35	0.26	0.54	0.35

Intersection Summary

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

9: Weber & California

Lane Group	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Lane Group Flow (vph)	51	142	17	290	253	345
v/c Ratio	0.12	0.10	0.03	0.26	0.17	0.22
Control Delay	12.5	7.6	15.3	13.6	11.8	10.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.5	7.6	15.3	13.6	11.8	10.4
Queue Length 50th (ft)	0	8	8	40	38	42
Queue Length 95th (ft)	27	17	18	65	57	87
Internal Link Dist (ft)		1479		973	315	675
Turn Bay Length (ft)						
Base Capacity (vph)	456	1400	580	1435	1521	1570
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	0.10	0.03	0.20	0.17	0.22

Intersection Summary

10: Washington & Center

Lane Group	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Lane Group Flow (vph)	142	365	179	1022	297
v/c Ratio	0.28	0.32	0.15	0.36	0.39
Control Delay	15.1	26.1	28.1	2.5	2.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	15.1	26.1	28.1	2.5	2.8
Queue Length 50th (ft)	31	84	44	15	8
Queue Length 95th (ft)	m46	m116	m59	23	12
Internal Link Dist (ft)			349	1102	
Turn Bay Length (ft)					
Base Capacity (vph)	643	1151	1205	2881	795
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	0.28	0.32	0.15	0.36	0.39

Intersection Summary

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

11: Washington & El Dorado

Lane Group	[illegible]	[illegible]	[illegible]	[illegible]
Lane Group Flow (vph)	345	2071	681	382
v/c Ratio	0.76	0.87	0.91dr	1.01
Control Delay	29.1	14.2	37.4	61.9
Queue Delay	0.0	0.4	0.0	0.0
Total Delay	29.1	16.5	37.4	61.9
Queue Length 50th (ft)	93	245	177	~227
Queue Length 95th (ft)	m107	284	#247	#424
Internal Link Dist (ft)	2284	345	785	
Turn Bay Length (ft)				
Base Capacity (vph)	456	3190	781	379
Starvation Cap Reductn	0	457	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.76	0.76	0.90	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.
m Volume for 95th percentile queue is metered by upstream signal.
dr Defacto Right Lane. Recode with 1 though lane as a right lane.

12: Washington & Stanislaus

Lane Group	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Lane Group Flow (vph)	1256	190	533	132	34
v/c Ratio	0.87	0.84	0.55	0.24	0.08
Control Delay	27.2	36.5	13.0	25.3	23.6
Queue Delay	0.0	0.0	0.6	0.0	0.0
Total Delay	27.2	36.5	13.6	25.3	23.6
Queue Length 50th (ft)	282	82	161	56	14
Queue Length 95th (ft)	356	#144	250	102	35
Internal Link Dist (ft)	553		361	1199	
Turn Bay Length (ft)					
Base Capacity (vph)	1501	312	967	546	445
Starvation Cap Reductn	0	0	169	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.84	0.64	0.66	0.24	0.08

Intersection Summary

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

Queues
13: Lafayette & Center

27/02/2009

Lane Group	[illegible]	[illegible]	[illegible]	[illegible]
Lane Group Flow (vph)	120	371	713	2314
v/c Ratio	0.31	0.53	0.36	1.06
Control Delay	30.3	13.5	10.7	64.9
Queue Delay	0.0	0.4	0.0	14.9
Total Delay	30.3	17.9	10.7	79.9
Queue Length 50th (ft)	18	57	42	~448
Queue Length 95th (ft)	35	196	86	#538
Internal Link Dist (ft)	553		305	532
Turn Bay Length (ft)				
Base Capacity (vph)	383	714	2010	1982
Starvation Cap Reductn	0	75	0	0
Spillback Cap Reductn	0	0	0	81
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.31	0.58	0.36	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.

Queues
14: Lafayette & El Dorado

27/02/2009

Lane Group	[illegible]	[illegible]	[illegible]
Lane Group Flow (vph)	711	1465	1629
v/c Ratio	0.87	0.72	0.31
Control Delay	12.0	6.0	14.8
Queue Delay	35.6	2.6	0.0
Total Delay	47.6	8.6	14.8
Queue Length 50th (ft)	0	28	74
Queue Length 95th (ft)	m154	m103	97
Internal Link Dist (ft)		1312	252
Turn Bay Length (ft)			
Base Capacity (vph)	853	2356	2587
Starvation Cap Reductn	147	519	0
Spillback Cap Reductn	11	0	43
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	1.07	0.82	0.31

Intersection Summary

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

Queues
15: Lafayette & Stanislaus

27/02/2009

Lane Group	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Lane Group Flow (vph)	192	146	147	61	392	152
v/c Ratio	0.58	0.35	0.58	0.09	0.99	0.29
Control Delay	33.4	25.0	158.9	7.4	51.7	21.8
Queue Delay	0.0	0.0	0.0	0.31	0.0	0.0
Total Delay	33.4	25.0	158.9	7.4	51.7	21.8
Queue Length 50th (ft)	41	63	~97	10	275	50
Queue Length 95th (ft)	68	118	m#161	m16	#503	120
Internal Link Dist (ft)	566	312		341	846	
Turn Bay Length (ft)						
Base Capacity (vph)	405	477	125	701	814	532
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	0.38	0.35	1.18	0.09	0.50	0.29

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.

Table 6 Worksheets

Please disregard worksheets for intersections 9 (Weber/California), 12 (Washington/Stanislaus) and 15 (Lafayette/Stanislaus) as they have not been incorporated into this traffic report.

Queues
1: Park & Center

27/02/2009

Lane Group	[illegible]	[illegible]
Lane Group Flow (vph)	979	1452
v/c Ratio	0.62	0.82
Control Delay	23.1	18.8
Queue Delay	0.9	0.0
Total Delay	24.0	18.8
Queue Length 50th (ft)	231	306
Queue Length 95th (ft)	306	253
Internal Link Dist (ft)	331	468
Turn Bay Length (ft)		
Base Capacity (vph)	1575	2534
Starvation Cap Reductn	313	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.78	0.82

Intersection Summary

Queues
2: Park & El Dorado

27/02/2009

Lane Group	[illegible]	[illegible]	[illegible]	[illegible]
Lane Group Flow (vph)	616	154	347	1953
v/c Ratio	0.67	0.33	0.37	0.86
Control Delay	27.5	23.1	1.8	3.7
Queue Delay	0.0	0.0	0.2	0.0
Total Delay	27.5	23.1	2.0	3.7
Queue Length 50th (ft)	114	59	3	45
Queue Length 95th (ft)	156	111	9	46
Internal Link Dist (ft)	334			503
Turn Bay Length (ft)				
Base Capacity (vph)	1085	460	940	2263
Starvation Cap Reductn	0	0	136	0
Spillback Cap Reductn	0	0	0	5
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.57	0.33	0.43	0.88

Intersection Summary

Queues
3: Oak & Center

27/02/2009

Lane Group	[illegible]	[illegible]	[illegible]
Lane Group Flow (vph)	256	130	1378
v/c Ratio	0.23	0.08	0.46
Control Delay	22.0	0.1	2.7
Queue Delay	0.0	0.0	0.2
Total Delay	22.0	0.1	2.9
Queue Length 50th (ft)	52	0	23
Queue Length 95th (ft)	82	0	29
Internal Link Dist (ft)	301		291
Turn Bay Length (ft)			
Base Capacity (vph)	1124	1540	2985
Starvation Cap Reductn	0	0	743
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.23	0.08	0.61

Intersection Summary

Queues
4: Oak & El Dorado

27/02/2009

Lane Group	[illegible]	[illegible]
Lane Group Flow (vph)	413	2118
v/c Ratio	0.37	0.58
Control Delay	19.8	2.4
Queue Delay	0.0	0.1
Total Delay	19.8	2.5
Queue Length 50th (ft)	96	28
Queue Length 95th (ft)	141	34
Internal Link Dist (ft)	312	320
Turn Bay Length (ft)		
Base Capacity (vph)	1107	3756
Starvation Cap Reductn	0	542
Spillback Cap Reductn	0	34
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.37	0.66

Intersection Summary

Queues
5: Fremont & Center

27/02/2009

Lane Group	[illegible]	[illegible]	[illegible]	[illegible]
Lane Group Flow (vph)	84	223	369	1350
v/c Ratio	0.12	0.16	0.29	0.41
Control Delay	17.3	0.2	8.9	4.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	17.3	0.2	8.9	4.2
Queue Length 50th (ft)	28	0	28	33
Queue Length 95th (ft)	57	0	36	34
Internal Link Dist (ft)	352		311	333
Turn Bay Length (ft)				
Base Capacity (vph)	723	1556	1256	3312
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.12	0.15	0.29	0.41

Intersection Summary

Queues
6: Fremont & El Dorado 27/02/2009

Lane Group					
Lane Group Flow (vph)	52	33	451	49	2034
v/c Ratio	0.30	0.04	0.56	0.06	0.84
Control Delay	12.1	7.6	21.6	5.0	8.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	12.1	7.6	21.6	5.0	8.8
Queue Length 50th (ft)	12	5	175	0	45
Queue Length 95th (ft)	26	m12	263	m8	50
Internal Link Dist (ft)		311	334		3416
Turn Bay Length (ft)					
Base Capacity (vph)	274	811	775	833	2997
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	0.30	0.04	0.58	0.06	0.68

Intersection Summary

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

Queues
7: Weber & Center 27/02/2009

Lane Group						
Lane Group Flow (vph)	1059	143	253	174	1708	350
v/c Ratio	0.86	0.57	0.22	0.25	0.84	0.44
Control Delay	33.5	34.6	6.5	5.9	18.1	1.5
Queue Delay	0.0	0.0	0.0	0.0	0.6	0.0
Total Delay	33.5	34.6	6.5	5.9	19.1	1.5
Queue Length 50th (ft)	287	58	12	27	304	0
Queue Length 95th (ft)	#365	m102	m34	44	394	0
Internal Link Dist (ft)	983		332		1419	
Turn Bay Length (ft)						
Base Capacity (vph)	1234	250	1129	708	2034	808
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	0.86	0.57	0.22	0.25	0.84	0.47

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: Weber & El Dorado 27/02/2009

Lane Group					
Lane Group Flow (vph)	238	545	406	2200	148
v/c Ratio	0.58	0.53	0.48	0.88	0.18
Control Delay	13.3	7.4	26.1	10.4	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	13.3	7.4	26.1	10.4	0.3
Queue Length 50th (ft)	17	29	96	133	1
Queue Length 95th (ft)	m25	m20	141	m144	m0
Internal Link Dist (ft)		332	1479	1061	
Turn Bay Length (ft)					
Base Capacity (vph)	397	1028	847	2505	838
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	0.59	0.53	0.48	0.88	0.18

Intersection Summary

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

Queues
9: Weber & California 27/02/2009

Lane Group						
Lane Group Flow (vph)	72	250	10	200	342	412
v/c Ratio	0.16	0.17	0.02	0.14	0.21	0.26
Control Delay	8.5	6.4	15.1	13.0	12.1	12.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.5	6.4	15.1	13.0	12.1	12.3
Queue Length 50th (ft)	0	8	3	27	40	50
Queue Length 95th (ft)	m0	23	13	48	74	88
Internal Link Dist (ft)		1479		323	315	875
Turn Bay Length (ft)						
Base Capacity (vph)	476	1453	454	1435	1634	1583
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	0.15	0.17	0.02	0.14	0.21	0.26

Intersection Summary

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

Queues
10: Washington & Center 27/02/2009

Lane Group					
Lane Group Flow (vph)	250	980	76	1772	519
v/c Ratio	0.42	0.86	0.06	0.66	0.67
Control Delay	14.4	25.8	13.2	3.9	6.1
Queue Delay	0.0	1.4	0.0	0.0	0.0
Total Delay	14.4	27.2	13.2	3.8	6.1
Queue Length 50th (ft)	95	270	15	67	45
Queue Length 95th (ft)	m112	m282	m14	71	m61
Internal Link Dist (ft)			346	1502	
Turn Bay Length (ft)					
Base Capacity (vph)	653	1170	1216	2696	775
Starvation Cap Reductn	0	73	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.41	0.89	0.06	0.66	0.67

Intersection Summary

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

Queues
11: Washington & El Dorado 27/02/2009

Lane Group				
Lane Group Flow (vph)	1109	1542	596	311
v/c Ratio	1.02	0.62	1.11dl	1.23
Control Delay	58.9	19.3	63.9	165.9
Queue Delay	0.0	0.0	11.2	0.0
Total Delay	58.9	19.3	95.1	165.9
Queue Length 50th (ft)	~324	210	136	~236
Queue Length 95th (ft)	#402	155	#225	#400
Internal Link Dist (ft)	2264	345	711	
Turn Bay Length (ft)				
Base Capacity (vph)	1092	2513	611	253
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	54	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.02	0.62	0.98	1.23

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.
dl Defacto Right Lane. Recode with 1 though lane as a right lane.

Queues
12: Washington & Stanislaus 27/02/2009

Lane Group					
Lane Group Flow (vph)	479	148	309	312	58
v/c Ratio	0.47	0.42	0.23	0.34	0.08
Control Delay	26.9	12.9	0.9	15.9	13.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	26.9	12.9	0.9	15.9	13.7
Queue Length 50th (ft)	85	19	2	97	16
Queue Length 95th (ft)	127	m27	m13	141	42
Internal Link Dist (ft)	553		341	1106	
Turn Bay Length (ft)					
Base Capacity (vph)	1085	354	1366	905	739
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	0.44	0.42	0.23	0.34	0.08

Intersection Summary

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

Queues
13: Lafayette & Center 27/02/2009

Lane Group				
Lane Group Flow (vph)	125	651	1009	747
v/c Ratio	0.26	0.61	0.36	0.70
Control Delay	27.2	4.5	5.9	34.3
Queue Delay	0.0	0.2	0.0	0.0
Total Delay	27.2	4.7	5.9	34.3
Queue Length 50th (ft)	18	22	41	126
Queue Length 95th (ft)	33	43	59	167
Internal Link Dist (ft)	351		395	532
Turn Bay Length (ft)				
Base Capacity (vph)	862	1074	2832	1144
Starvation Cap Reductn	0	77	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.15	0.65	0.36	0.64

Intersection Summary

Queues
14: Lafayette & El Dorado 27/02/2009

Lane Group			
Lane Group Flow (vph)	337	1048	1149
v/c Ratio	0.81	0.84	0.32
Control Delay	29.5	30.3	9.7
Queue Delay	0.0	0.0	0.0
Total Delay	29.5	30.3	9.7
Queue Length 50th (ft)	174	138	75
Queue Length 95th (ft)	177	157	128
Internal Link Dist (ft)		332	253
Turn Bay Length (ft)			
Base Capacity (vph)	798	2431	3582
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.42	0.43	0.32

Intersection Summary

Lane Group	→	↑	↘	↓	↘	↘
Lane Group Flow (vph)	737	233	279	135	249	124
v/c Ratio	1.14dl	0.54	0.86	0.16	0.53	0.49
Control Delay	46.5	29.3	69.5	9.7	74.3	31.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.5	29.3	69.5	9.7	74.3	31.2
Queue Length 50th (ft)	199	58	153	18	134	44
Queue Length 95th (ft)	#301	167	#279	44	#277	98
Internal Link Dist (ft)	680	312		341	644	
Turn Bay Length (ft)						
Base Capacity (vph)	638	465	282	864	269	257
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	0.88	0.50	0.99	0.16	0.93	0.48

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Lane Group	←	↓
Lane Group Flow (vph)	960	1453
v/c Ratio	0.62	0.63
Control Delay	22.0	18.6
Queue Delay	0.2	0.0
Total Delay	23.9	18.6
Queue Length 50th (ft)	231	208
Queue Length 95th (ft)	316	253
Internal Link Dist (ft)	335	484
Turn Bay Length (ft)		
Base Capacity (vph)	1575	2334
Starvation Cap Reductn	312	0
Spillback Cap Reductn	0	20
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.76	0.63

Intersection Summary

Lane Group	←	↘	↖	↑
Lane Group Flow (vph)	616	156	251	1977
v/c Ratio	0.57	0.33	0.57	0.89
Control Delay	27.3	23.3	1.8	5.5
Queue Delay	0.0	0.0	0.2	0.0
Total Delay	27.3	23.3	2.0	5.5
Queue Length 50th (ft)	144	59	2	43
Queue Length 95th (ft)	196	111	9	51
Internal Link Dist (ft)	334			303
Turn Bay Length (ft)				
Base Capacity (vph)	1085	481	940	2983
Starvation Cap Reductn	0	0	136	0
Spillback Cap Reductn	0	0	3	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.57	0.33	0.41	0.69

Intersection Summary

Lane Group	→	↘	↓
Lane Group Flow (vph)	254	130	1377
v/c Ratio	0.23	0.08	0.46
Control Delay	22.0	0.1	2.7
Queue Delay	0.0	0.0	0.2
Total Delay	22.0	0.1	2.9
Queue Length 50th (ft)	32	0	23
Queue Length 95th (ft)	82	0	29
Internal Link Dist (ft)	385		291
Turn Bay Length (ft)			
Base Capacity (vph)	1124	1568	2993
Starvation Cap Reductn	0	0	743
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.23	0.08	0.61

Intersection Summary

Lane Group	→	↑
Lane Group Flow (vph)	413	2144
v/c Ratio	0.37	0.57
Control Delay	19.6	2.3
Queue Delay	0.0	0.2
Total Delay	19.6	2.5
Queue Length 50th (ft)	95	70
Queue Length 95th (ft)	141	34
Internal Link Dist (ft)	312	323
Turn Bay Length (ft)		
Base Capacity (vph)	1107	3756
Starvation Cap Reductn	0	575
Spillback Cap Reductn	0	20
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.37	0.67

Intersection Summary

Lane Group	→	↘	←	↓
Lane Group Flow (vph)	84	224	375	1351
v/c Ratio	0.12	0.15	0.30	0.41
Control Delay	17.3	0.2	9.2	4.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	17.3	0.2	9.2	4.2
Queue Length 50th (ft)	26	0	27	33
Queue Length 95th (ft)	57	0	38	34
Internal Link Dist (ft)	352		311	333
Turn Bay Length (ft)				
Base Capacity (vph)	723	1540	1258	3313
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.12	0.15	0.30	0.41

Intersection Summary

Lane Group	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Lane Group Flow (vph)	82	33	451	54	2048
v/c Ratio	0.30	0.04	0.58	0.06	0.70
Control Delay	12.1	7.8	21.8	5.7	8.7
Queue Delay	0.0	0.0	0.0	0.0	0.9
Total Delay	12.1	7.8	21.9	5.7	9.7
Queue Length 50th (ft)	12	6	176	7	79
Queue Length 95th (ft)	20	m12	263	m8	82
Internal Link Dist (ft)		341	334		1418
Turn Bay Length (ft)					
Base Capacity (vph)	276	851	775	833	2897
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	0.30	0.04	0.58	0.06	0.70

Intersection Summary

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

Lane Group	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Lane Group Flow (vph)	1059	183	293	174	1798	356
v/c Ratio	0.86	0.73	0.25	0.25	0.84	0.42
Control Delay	33.5	46.1	9.0	6.9	10.1	1.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.5	46.1	9.0	6.9	10.1	1.5
Queue Length 50th (ft)	287	85	18	27	304	0
Queue Length 95th (ft)	#365	m#154	m49	44	366	0
Internal Link Dist (ft)	960		332		1610	
Turn Bay Length (ft)						
Base Capacity (vph)	1234	250	1161	706	2134	826
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	0.86	0.73	0.25	0.25	0.84	0.42

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	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Lane Group Flow (vph)	231	550	467	2217	151
v/c Ratio	0.64	0.56	0.57	0.89	0.18
Control Delay	16.1	8.0	28.3	10.6	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	16.1	8.0	28.3	10.6	0.3
Queue Length 50th (ft)	32	20	116	136	0
Queue Length 95th (ft)	m47	m28	170	m150	m0
Internal Link Dist (ft)		332	1479	1061	
Turn Bay Length (ft)					
Base Capacity (vph)	363	985	812	2508	848
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	0.56	0.57	0.89	0.18

Intersection Summary

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

Queues
9: Weber & California

27/02/2009

Lane Group	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Lane Group Flow (vph)	72	277	10	203	342	423
v/c Ratio	0.15	0.18	0.03	0.14	0.21	0.27
Control Delay	8.5	6.1	16.2	13.1	12.1	12.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.5	6.1	16.2	13.1	12.1	12.4
Queue Length 50th (ft)	0	15	3	28	49	62
Queue Length 95th (ft)	m0	26	13	55	74	91
Internal Link Dist (ft)		1479		825	315	675
Turn Bay Length (ft)						
Base Capacity (vph)	474	1434	437	1435	1638	1594
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	0.15	0.19	0.02	0.14	0.21	0.27

Intersection Summary

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

Queues
10: Washington & Center

27/02/2009

Lane Group	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Lane Group Flow (vph)	259	993	79	1873	549
v/c Ratio	0.42	0.86	0.06	0.70	0.71
Control Delay	14.7	25.8	13.2	4.5	7.8
Queue Delay	0.0	1.4	0.0	0.0	0.1
Total Delay	14.7	27.1	13.2	4.5	7.9
Queue Length 50th (ft)	97	269	12	75	58
Queue Length 95th (ft)	m113	m262	m14	87	m77
Internal Link Dist (ft)			348	1102	
Turn Bay Length (ft)					
Base Capacity (vph)	631	1179	1216	2682	772
Starvation Cap Reductn	0	73	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.41	0.90	0.06	0.70	0.71

Intersection Summary

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

Queues
11: Washington & El Dorado

27/02/2009

Lane Group	[illegible]	[illegible]	[illegible]	[illegible]
Lane Group Flow (vph)	1108	1570	309	311
v/c Ratio	1.02	0.62	1.11dl	1.23
Control Delay	37.1	19.4	54.3	169.9
Queue Delay	0.0	0.0	11.5	0.0
Total Delay	37.1	19.4	65.8	169.9
Queue Length 50th (ft)	~325	219	138	~226
Queue Length 95th (ft)	#461	158	#226	#409
Internal Link Dist (ft)	2264	345	711	
Turn Bay Length (ft)				
Base Capacity (vph)	1092	2513	571	253
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	54	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.01	0.62	0.58	1.23

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.

Queues
12: Washington & Stanislaus

27/02/2009

Lane Group	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Lane Group Flow (vph)	445	144	308	367	59
v/c Ratio	0.82	0.34	0.23	0.48	0.08
Control Delay	29.3	10.8	1.3	20.8	16.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	29.3	10.8	1.3	20.8	16.2
Queue Length 50th (ft)	90	19	0	132	17
Queue Length 95th (ft)	125	m26	m18	238	44
Internal Link Dist (ft)	550		341	519	
Turn Bay Length (ft)					
Base Capacity (vph)	1056	437	1340	814	667
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	0.48	0.34	0.23	0.45	0.09

Intersection Summary

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

Queues
13: Lafayette & Center

27/02/2009

Lane Group	[illegible]	[illegible]	[illegible]	[illegible]
Lane Group Flow (vph)	125	674	1005	755
v/c Ratio	0.25	0.63	0.36	0.71
Control Delay	27.2	5.1	5.4	34.4
Queue Delay	0.0	0.3	0.0	0.0
Total Delay	27.2	5.4	5.4	34.4
Queue Length 50th (ft)	15	35	42	130
Queue Length 95th (ft)	33	53	53	189
Internal Link Dist (ft)	551		306	332
Turn Bay Length (ft)				
Base Capacity (vph)	562	1073	2829	1065
Starvation Cap Reductn	0	86	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.36	0.68	0.36	0.71

Intersection Summary

Queues
14: Lafayette & El Dorado

27/02/2009

Lane Group	[illegible]	[illegible]	[illegible]
Lane Group Flow (vph)	337	1044	1149
v/c Ratio	0.60	0.64	0.33
Control Delay	29.2	30.2	9.7
Queue Delay	0.0	0.0	0.0
Total Delay	29.2	30.2	9.7
Queue Length 50th (ft)	79	188	27
Queue Length 95th (ft)	174	155	176
Internal Link Dist (ft)			253
Turn Bay Length (ft)			
Base Capacity (vph)	798	2451	3580
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.42	0.43	0.32

Intersection Summary

Queues
15: Lafayette & Stanislaus

27/02/2009

Lane Group	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Lane Group Flow (vph)	750	233	336	135	249	123
v/c Ratio	0.98	0.56	0.82	0.13	1.02	0.62
Control Delay	49.2	33.0	54.1	10.0	104.0	33.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.2	33.0	54.1	10.0	104.0	33.6
Queue Length 50th (ft)	297	102	164	18	148	44
Queue Length 95th (ft)	#316	175	#311	55	#251	100
Internal Link Dist (ft)	880	312		341	648	
Turn Bay Length (ft)						
Base Capacity (vph)	836	414	396	996	243	218
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	0.91	0.56	0.82	0.16	1.02	0.53

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.
dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Table 8 Worksheets

HCM Signalized Intersection Capacity Analysis
10: Washington & Center

27/02/2009

Movement	WBL2	WBL	WBT	SBT	SBR	SBR2
Lane Configurations	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
Volume (vph)	238	928	77	1294	730	84
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.8	3.8	3.8	3.4	3.4	
Lane Util. Factor	1.00	0.97	0.95	0.86	0.86	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	0.98	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	1.00	0.97	0.85	
Flt Protected	0.95	0.95	1.00	1.00	1.00	
Satd. Flow (prot)	1770	3433	3539	4634	1313	
Flt Permitted	0.95	0.95	1.00	1.00	1.00	
Satd. Flow (perm)	1770	3433	3539	4634	1313	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	259	1009	84	1407	793	91
RTOR Reduction (vph)	25	0	0	0	9	0
Lane Group Flow (vph)	234	1009	84	1772	610	0
Confl. Peds. (#/hr)	10	10			10	10
Turn Type	Split	Split			Perm	
Protected Phases	4	4	4	2		
Permitted Phases			4		2	
Actuated Green, G (s)	28.3	28.3	28.3	48.7	48.7	
Effective Green, g (s)	28.5	28.5	28.5	49.3	49.3	
Actuated g/C Ratio	0.34	0.34	0.34	0.58	0.58	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	593	1151	1187	2688	762	
v/s Ratio Prot	0.13	c0.29	0.02	0.38		
v/s Ratio Perm					c0.38	
v/c Ratio	0.39	0.88	0.07	0.66	0.67	
Uniform Delay, d1	21.8	26.8	19.2	12.1	12.5	
Progression Factor	0.75	0.85	0.71	0.25	0.24	
Incremental Delay, d2	0.2	3.1	0.0	0.8	2.8	
Delay (s)	16.4	25.8	13.8	3.8	6.1	
Level of Service	B	C	B	A	A	
Approach Delay (s)			23.3	4.3		
Approach LOS			C	A		

Intersection Summary

HCM Average Control Delay	11.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	7.2
Intersection Capacity Utilization	73.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
13: Lafayette & Center

27/02/2009

Movement	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Lane Configurations	[illegible]		[illegible]	[illegible]	[illegible]	
Volume (vph)	83	29	336	655	1618	132
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.8		3.4	3.4	3.4	
Lane Util. Factor	0.91		1.00	0.91	0.94	
Frpb, ped/bikes	0.98		1.00	1.00	1.00	
Flpb, ped/bikes	1.00		1.00	1.00	0.99	
Frt	0.98		1.00	1.00	0.99	
Flt Protected	1.00		0.95	1.00	0.96	
Satd. Flow (prot)	4847		1770	5085	4891	
Flt Permitted	1.00		0.95	1.00	0.96	
Satd. Flow (perm)	4847		1770	5085	4891	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	90	30	365	712	1759	143
RTOR Reduction (vph)	28	0	15	0	0	0
Lane Group Flow (vph)	92	0	350	712	1902	0
Confl. Peds. (#/hr)		10	10		10	10
Turn Type			Prot			
Protected Phases	4		5	2		
Permitted Phases					3	
Actuated Green, G (s)	6.0		33.0	33.0	34.0	
Effective Green, g (s)	8.2		33.8	33.8	34.8	
Actuated g/C Ratio	0.07		0.40	0.40	0.41	
Clearance Time (s)	4.0		4.0	4.0	4.0	
Lane Grp Cap (vph)	356		700	2010	1891	
v/s Ratio Prot	c0.02		c0.20	0.14		
v/s Ratio Perm					c0.38	
v/c Ratio	0.26		0.50	0.35	0.98	
Uniform Delay, d1	37.2		19.4	18.1	24.8	
Progression Factor	1.00		0.58	0.56	1.00	
Incremental Delay, d2	1.8		2.4	0.5	12.1	
Delay (s)	39.0		13.8	10.6	36.5	
Level of Service	D		B	B	D	
Approach Delay (s)	39.0			11.6	36.5	
Approach LOS	D			B	D	

Intersection Summary			
HCM Average Control Delay	29.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	10.6
Intersection Capacity Utilization	83.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
14: Lafayette & El Dorado

27/02/2009

Movement	[illegible]
[illegible]	[illegible]

Intersection Summary			
HCM Average Control Delay	9.4	HCM Level of Service	A
HCM Volume to Capacity ratio	[illegible]		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	7.2
Intersection Capacity Utilization	[illegible]	ICU Level of Service	[illegible]
Analysis Period (min)	15		
c Critical Lane Group			


```
MITIGA - AM Peak Hour      Fri Feb 27, 2009 12:10:[illegible]        Page 1-1
Base Case (without Project)
Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)
Intersection #4 Lafayette/Madison
[illegible]
Note: Queue reported is the number of cars per lane.
```

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MITIGA - AM Peak Hour      Fri Feb 27, 2009 12:0[illegible]        Page 1-1
Base Case (without Project)
Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)
Intersection #3 Market/Madison
[illegible]
Note: Queue reported is the number of cars per lane.
```

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```
MITIGA - AM Peak Hour      Fri Feb 27, 2009 12:07:15            Page 1-1
Base Case (without Project)
Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)
Intersection #2 Weber/Madison
Average Delay (sec/veh):   0.8    Worst Case Level Of Service: B[ 12.4]
Approach:    North Bound     South Bound     East Bound      West Bound
Movement:    L - T - R       L - T - R       L - T - R       L - T - R
Control:      Stop Sign       Stop Sign      Uncontrolled    Uncontrolled
Rights:        Include         Include         Include         Include
Lanes:       0 0 1! 0 0      0 0 0 0 0      0 0 0 1 0       0 1 0 0 0
Volume Module:
Base Vol:     13    0   19     0    0    0     0  266    5    16  371    0
Growth 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
Initial Bse:  13    0   19     0    0    0     0  266    5    16  371    0
User 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
PHF Adj:    0.92 0.92 0.92  0.92 0.92 0.92  0.92 0.92 0.92  0.92 0.92 0.92
PHF Volume:   14    0   21     0    0    0     0  291    5    17  403    0
Reduct Vol:    0    0    0     0    0    0     0    0    0     0    0    0
FinalVolume:  14    0   21     0    0    0     0  291    5    17  403    0
Critical Gap Module:
Critical Gp: 6.4  6.5  6.2 xxxxx xxxx xxxxx xxxxx xxxx xxxxx   4.1 xxxx xxxxx
FollowUpTim: 3.5  4.0  3.3 xxxxx xxxx xxxxx xxxxx xxxx xxxxx   2.2 xxxx xxxxx
Capacity Module:
Cnflict Vol: 736  736  314  xxxx xxxx xxxxx  xxxx xxxx xxxxx   297 xxxx xxxxx
Potent Cap.: 379  340  731  xxxx xxxx xxxxx  xxxx xxxx xxxxx  1265 xxxx xxxxx
Move Cap.:   366  339  719  xxxx xxxx xxxxx  xxxx xxxx xxxxx  1265 xxxx xxxxx
Volume/Cap: 0.04 0.00 0.03  xxxx xxxx  xxxx  xxxx xxxx  xxxx  0.02 xxxx  xxxx
Level Of Service Module:
2Way95thQ:  xxxx xxxx xxxxx xxxx xxxx xxxxx xxxx xxxx xxxxx   0.0 xxxx xxxxx
Control Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx 7.9 xxxx xxxxx
LOS by Move:   *    *    *     *    *    *     *    *    *     A    *    *
Movement:    LT - LTR - RT   LT - LTR - RT   LT - LTR - RT   LT - LTR - RT
Shared Cap.: xxxx  576 xxxxx xxxx xxxx xxxxx xxxx xxxx xxxxx xxxx xxxx xxxxx
SharedQueue:xxxxx  0.2 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx  0.0 xxxx xxxxx
Shrd ConDel:xxxxx 12.4 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx  7.9 xxxx xxxxx
Shared LOS:    *    B    *     *    *    *     *    *    *     A    *    *
ApproachDel:      12.4           xxxxxx          xxxxxx          xxxxxx
ApproachLOS:        B              *               *               *
Note: Queue reported is the number of cars per lane.
```

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MITIGA - AM Peak Hour      Fri Feb 27, 2009 12:09:2[illegible]        Page 1-1
Base Case (without Project)
Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)
Intersection #3 Washington/Madison
Average Delay (sec/veh):   2.1    Worst Case Level Of Service: A[  9.7]
Approach:    North Bound     South Bound     East Bound      West Bound
Movement:    L - T - R       L - T - R       L - T - R       L - T - R
Control:      Stop Sign       Stop Sign      Uncontrolled    Uncontrolled
Rights:        Include         Include         Include         Include
Lanes:       0 1 0 0 0      0 0 0 1 0      0 0 0 0 0       0 1 1 1 0
Volume Module:
Base Vol:     25    4    0     0    9    8     0    0    0     5  139   33
Growth 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
Initial Bse:  25    4    0     0    9    8     0    0    0     5  139   33
User 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
PHF Adj:    0.92 0.92 0.92  0.92 0.92 0.92  0.92 0.92 0.92  0.92 0.92 0.92
PHF Volume:   27    5    0     0   10    9     0    0    0     5  151   36
Reduct Vol:    0    0    0     0    0    0     0    0    0     0    0    0
FinalVolume:  27    5    0     0   10    9     0    0    0     5  151   36
Critical Gap Module:
Critical Gp: 7.1  6.5 xxxxx xxxxx  6.5  6.2 xxxxx xxxx xxxxx   4.1 xxxx xxxxx
FollowUpTim: 3.5  4.0 xxxxx xxxxx  4.0  3.3 xxxxx xxxx xxxxx   2.2 xxxx xxxxx
Capacity Module:
Cnflict Vol:  46  210 xxxxx  xxxx  200   46  xxxx xxxx xxxxx    10 xxxx xxxxx
Potent Cap.: 965  689 xxxxx  xxxx  700  375  xxxx xxxx xxxxx  1631 xxxx xxxxx
Move Cap.:   870  670 xxxxx  xxxx  686  353  xxxx xxxx xxxxx  1609 xxxx xxxxx
Volume/Cap: 0.03 0.01  xxxx  xxxx 0.01 0.01  xxxx xxxx  xxxx  0.00 xxxx  xxxx
Level Of Service Module:
2Way95thQ:  xxxx xxxx xxxxx xxxx xxxx xxxxx xxxx xxxx xxxxx   0.0 xxxx xxxxx
Control Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx 7.3 xxxx xxxxx
LOS by Move:   *    *    *     *    *    *     *    *    *     A    *    *
Movement:    LT - LTR - RT   LT - LTR - RT   LT - LTR - RT   LT - LTR - RT
Shared Cap.:  811 xxxx xxxxx xxxx xxxx  791 xxxx xxxx xxxxx xxxx xxxx xxxxx
SharedQueue:  0.1 xxxx xxxxx xxxxx xxxx  0.1 xxxxx xxxx xxxxx  0.0 xxxx xxxxx
Shrd ConDel:  9.6 xxxx xxxxx xxxxx xxxx  9.7 xxxxx xxxx xxxxx  7.3 xxxx xxxxx
Shared LOS:    A    *    *     *    *    A     *    *    *     A    *    *
ApproachDel:       9.6             9.7           xxxxxx          xxxxxx
ApproachLOS:        A               A              *               *
Note: Queue reported is the number of cars per lane.
```

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MITIGA - AM Peak Hour      Fri Feb 27, 2009 12:12:11            Page 1-1
Base Case (without Project)
Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)
Intersection #1 Weber/Van Buren
Average Delay (sec/veh):   1.2    Worst Case Level Of Service: B[ 13.5]
Approach:    North Bound     South Bound     East Bound      West Bound
Movement:    L - T - R       L - T - R       L - T - R       L - T - R
Control:      Stop Sign       Stop Sign      Uncontrolled    Uncontrolled
Rights:        Include         Include         Include         Include
Lanes:       0 0 1! 0 0      0 0 1! 0 0      0 0 1! 0 0      0 0 1! 0 0
Volume Module:
Base Vol:      3    8   17     3    0    1     2  209    4    38  254   40
Growth 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
Initial Bse:   3    8   17     3    0    1     2  209    4    38  254   40
User 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
PHF Adj:    0.92 0.92 0.92  0.92 0.92 0.92  0.92 0.92 0.92  0.92 0.92 0.92
PHF Volume:    3   10   18     3    0    1     2  227    4    41  276   43
Reduct Vol:    0    0    0     0    0    0     0    0    0     0    0    0
FinalVolume:   3   10   18     3    0    1     2  227    4    41  276   43
Critical Gap Module:
Critical Gp: 7.1  6.5  6.2   7.1  6.5  6.2   4.1 xxxx xxxxx   4.1 xxxx xxxxx
FollowUpTim: 3.5  4.0  3.3   3.5  4.0  3.3   2.2 xxxx xxxxx   2.2 xxxx xxxxx
Capacity Module:
Cnflict Vol: 625  656  349   664  674  229   320 xxxx xxxxx   243 xxxx xxxxx
Potent Cap.: 394  386  794   366  376  737  1241 xxxx xxxxx  1337 xxxx xxxxx
Move Cap.:   377  369  781   354  376  735  1231 xxxx xxxxx  1326 xxxx xxxxx
Volume/Cap: 0.01 0.03 0.02  0.01 0.00 0.00  0.00 xxxx  xxxx  0.03 xxxx  xxxx
Level Of Service Module:
2Way95thQ:  xxxx xxxx xxxxx xxxx xxxx xxxxx  0.0 xxxx xxxxx   0.1 xxxx xxxxx
Control Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx 7.9 xxxx xxxxx   7.6 xxxx xxxxx
LOS by Move:   *    *    *     *    *    *     A    *    *     A    *    *
Movement:    LT - LTR - RT   LT - LTR - RT   LT - LTR - RT   LT - LTR - RT
Shared Cap.: xxxx  544 xxxxx  xxxx  474 xxxxx xxxx xxxx xxxxx xxxx xxxx xxxxx
SharedQueue:xxxxx  0.2 xxxxx xxxxx  0.0 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx 12.0 xxxxx xxxxx 12.5 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    B    *     *    B    *     *    *    *     *    *    *
ApproachDel:      12.0            12.5           xxxxxx          xxxxxx
ApproachLOS:        B               B              *               *
Note: Queue reported is the number of cars per lane.
```

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HCM Signalized Intersection Capacity Analysis
10: Washington & Center

27/02/2009

Movement	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Lane Configurations	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
Volume (vph)	262	241	165	790	313	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.8	3.8	3.8	3.4	3.4	
Lane Util. Factor	0.91	0.91	0.95	0.86	0.86	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	0.96	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	1.00	0.98	0.85	
Flt Protected	0.95	0.96	1.00	1.00	1.00	
Satd. Flow (prot)	1610	3221	3539	4897	1313	
Flt Permitted	0.95	0.96	1.00	1.00	1.00	
Satd. Flow (perm)	1610	3221	3539	4897	1313	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	285	262	179	867	342	74
RTOR Reduction (vph)	95	45	0	0	15	0
Lane Group Flow (vph)	90	320	179	907	271	0
Confl. Peds. (#/hr)	10	10			10	10
Turn Type	Split	Split			Perm	
Protected Phases	4	4	4	2		
Permitted Phases					2	
Actuated Green, G (s)	29.0	29.0	29.0	48.0	48.0	
Effective Green, g (s)	29.2	29.2	29.2	48.8	48.8	
Actuated g/C Ratio	0.34	0.34	0.34	0.57	0.57	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)	553	1107	1216	2806	751	
v/s Ratio Prot	0.06	c0.10	0.05	c0.23		
v/s Ratio Perm					0.21	
v/c Ratio	0.16	0.29	0.15	0.37	0.36	
Uniform Delay, d1	19.4	20.3	19.3	9.9	9.8	
Progression Factor	2.28	1.54	1.44	0.21	0.10	
Incremental Delay, d2	0.4	0.5	0.2	0.3	1.1	
Delay (s)	44.5	31.7	27.9	2.4	2.5	
Level of Service	D	C	C	A	A	
Approach Delay (s)			34.5	2.4		
Approach LOS			C	A		

Intersection Summary			
HCM Average Control Delay	13.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	7.2
Intersection Capacity Utilization	32.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
11: Washington & El Dorado

27/02/2009

Movement	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Lane Configurations	[illegible]			[illegible]	[illegible]	[illegible]
Volume (vph)	210	108	204	1436	283	612
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.8			2.9	2.9	2.9
Lane Util. Factor	0.95			0.86	0.97	0.91
Frpb, ped/bikes	0.99			1.00	0.98	0.96
Flpb, ped/bikes	1.00			1.00	1.00	1.00
Frt	0.96			1.00	0.92	0.85
Flt Protected	1.00			0.99	0.96	1.00
Satd. Flow (prot)	3351			6370	3215	1406
Flt Permitted	1.00			0.99	0.96	1.00
Satd. Flow (perm)	3351			6370	3215	1406
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	228	117	222	1429	308	665
RTOR Reduction (vph)	16	0	0	29	0	0
Lane Group Flow (vph)	329	0	0	1619	941	332
Confl. Peds. (#/hr)		10	10		10	10
Turn Type			Split			Perm
Protected Phases	4		2	2	3	
Permitted Phases						3
Actuated Green, G (s)	11.2			40.0	21.8	21.8
Effective Green, g (s)	11.4			41.1	22.9	22.9
Actuated g/C Ratio	0.13			0.48	0.27	0.27
Clearance Time (s)	4.0			4.0	4.0	4.0
Lane Grp Cap (vph)	447			3080	866	379
v/s Ratio Prot	c0.10			c0.25	0.29	
v/s Ratio Perm						c0.24
v/c Ratio	0.74			0.53	0.75	0.88
Uniform Delay, d1	35.3			15.9	28.3	29.7
Progression Factor	0.59			0.93	1.00	1.00
Incremental Delay, d2	8.7			0.7	5.8	23.6
Delay (s)	27.9			15.4	34.0	53.3
Level of Service	C			B	C	D
Approach Delay (s)	27.9			15.4	40.6	
Approach LOS	C			B	D	

Intersection Summary			
HCM Average Control Delay	24.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.6
Intersection Capacity Utilization	77.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

MITIG6 - AM Peak Hour   Fri Feb 27, 2009 12:24:47   Page 1-1

Base Case (without Project)

Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)

Intersection #2 Washington/Lincoln/VB Onramp

Average Delay (sec/veh): 3.7   Worst Case Level Of Service: B[10.9]

Note: Queue reported is the number of cars per lane.

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HCM Signalized Intersection Capacity Analysis
13: Lafayette & Center
27/02/2009

c Critical Lane Group

2013 AM Peak Hour 19/02/2009 Base Case   Synchro 7 - Report
%user_name%   Page 1

HCM Signalized Intersection Capacity Analysis
14: Lafayette & El Dorado
27/02/2009

c Critical Lane Group

2013 AM Peak Hour 19/02/2009 Base Case   Synchro 7 - Report
%user_name%   Page 1

HCM Signalized Intersection Capacity Analysis
10: Washington & Center
27/02/2009

c Critical Lane Group

2013 AM Peak Hour 19/02/2009 Base Case   Synchro 7 - Report
%user_name%   Page 1

HCM Signalized Intersection Capacity Analysis
11: Washington & El Dorado
27/02/2009

dl Defacto Left Lane. Recode with 1 though lane as a left lane.
c Critical Lane Group

2013 AM Peak Hour 19/02/2009 Base Case   Synchro 7 - Report
%user_name%   Page 1

HCM Signalized Intersection Capacity Analysis
13: Lafayette & Center
27/02/2009

c Critical Lane Group

2013 AM Peak Hour 19/02/2009 Base case + Project Alternative Site   Synchro 7 - Report
%user_name%   Page 1

HCM Signalized Intersection Capacity Analysis
14: Lafayette & El Dorado
27/02/2009

c Critical Lane Group

2013 AM Peak Hour 19/02/2009 Base case + Project Alternative Site   Synchro 7 - Report
%user_name%   Page 1

MITIG6 - AM Peak Hour   Fri Feb 27, 2009 12:21:26   Page 1-1

2013 Base Case + Project

Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)

Intersection #6 Lafayette/Madison

Average Delay (sec/veh): 3.0   Worst Case Level Of Service: B[14.6]

Note: Queue reported is the number of cars per lane.

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MITIG6 - AM Peak Hour   Fri Feb 27, 2009 12:23:23   Page 1-1

2013 Base Case + Project

Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)

Intersection #4 Market/Madison

Average Delay (sec/veh): 5.1   Worst Case Level Of Service: A[9.8]

Note: Queue reported is the number of cars per lane.

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MITIGA - AM Peak Hour Fri Feb 27, 2009 13:21:27 Page 1-1

2013 Base Case + Project

Level Of Service Computation Report

2000 HCM Unsignalized Method (Base Volume Alternative)

Intersection #1 Weber/Madison

Average Delay (sec/veh): 4.4 Worst Case Level Of Service: B[13.9]

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:	Include			Include			Include			Include		
Lanes:	0 0 1! 0 0			0 0 0 0 0			0 0 0 1 0			0 1 0 0 0		
Volume Module:												
Base Vol:	13	0	41	0	0	0	0	279	5	16	553	0
Growth 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
Initial Bse:	13	0	41	0	0	0	0	279	5	16	553	0
User 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
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	14	0	45	0	0	0	0	303	5	20	601	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	14	0	45	0	0	0	0	303	5	20	601	0
Critical Gap Module:												
Critical Gp:	6.4	6.5	6.2	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	4.1	xxxx	xxxxx
FollowUpTim:	3.5	4.0	3.3	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	2.2	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	944	946	306	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	319	xxxx	xxxxx
Potent Cap.:	293	256	730	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	1252	xxxx	xxxxx
Move Cap.:	277	246	730	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	1241	xxxx	xxxxx
Volume/Cap:	0.05	0.00	0.06	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	0.02	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.0	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	7.9	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	*	*	*	A	*	*
Movement:	LT - LTR - RT			LT - LTR - RT			LT - LTR - RT			LT - LTR - RT		
Shared Cap.:	xxxx	515	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	0.4	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	0.0	xxxx	xxxxx
Shrd ConDel:	xxxxx	13.9	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	7.9	xxxx	xxxxx
Shared LOS:	*	B	*	*	*	*	*	*	*	A	*	*
ApproachDel:		13.9			xxxxxx			xxxxxx			xxxxxx	
ApproachLOS:		B			*			*			*	

Note: Queue reported is the number of cars per lane.

MITIGA - AM Peak Hour Fri Feb 27, 2009 13:27:57 Page 1-1

2013 Base Case + Project

Level Of Service Computation Report

2000 HCM Unsignalized Method (Base Volume Alternative)

Intersection #3 Washington/Madison

Average Delay (sec/veh): 3.4 Worst Case Level Of Service: B[14.6]

[illegible]

Note: Queue reported is the number of cars per lane.

MITIGA - AM Peak Hour Fri Feb 27, 2009 13:21:33 Page 1-1

2013 Base Case + Project

Level Of Service Computation Report

2000 HCM Unsignalized Method (Base Volume Alternative)

Intersection #1 Weber/Van Buren

Average Delay (sec/veh): 3.2 Worst Case Level Of Service: C[22.2]

[illegible]

Note: Queue reported is the number of cars per lane.

HCM Signalized Intersection Capacity Analysis

10: Washington & Center 27/02/2009

[illegible]

HCM Average Control Delay 17.0 HCM Level of Service B

HCM Signalized Intersection Capacity Analysis

11: Washington & El Dorado 27/02/2009

[illegible]

HCM Average Control Delay 29.8 HCM Level of Service C

MITIGA - AM Peak Hour Fri Feb 27, 2009 13:27:08 Page 1-1

2013 Base Case + Project

Level Of Service Computation Report

2000 HCM Unsignalized Method (Base Volume Alternative)

Intersection #3 Washington/Lincoln/SR Onramp

Average Delay (sec/veh): 3.3 Worst Case Level Of Service: A[10.0]

[illegible]

Note: Queue reported is the number of cars per lane.

HCM Signalized Intersection Capacity Analysis

13: Lafayette & Center 27/02/2009

[illegible]

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

14: Lafayette & El Dorado 27/02/2009

[illegible]

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

11: Washington & El Dorado 27/02/2009

[illegible]

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

c Critical Lane Group

Table 9 Worksheets

Queues
8: Weber & El Dorado — 27/02/2009

Lane Group	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Lane Group Flow (vph)	252	573	406	2250	148
v/c Ratio	0.63	0.56	0.48	0.88	0.10
Control Delay	13.2	7.4	25.3	11.0	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	13.2	7.4	25.3	11.0	0.4
Queue Length 50th (ft)	19	21	97	132	0
Queue Length 95th (ft)	m25	m27	142	m218	m0
Internal Link Dist (ft)		332	1479	1061	
Turn Bay Length (ft)					
Base Capacity (vph)	397	1019	845	2556	808
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	0.63	0.56	0.48	0.88	0.18

Intersection Summary

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

Queues
13: Lafayette & Center — 27/02/2009

Lane Group	[illegible]	[illegible]	[illegible]	[illegible]
Lane Group Flow (vph)	120	366	712	1992
v/c Ratio	0.31	0.51	0.35	0.95
Control Delay	30.5	13.2	10.7	37.4
Queue Delay	0.0	0.4	0.0	1.7
Total Delay	30.5	13.6	10.7	39.1
Queue Length 50th (ft)	18	84	42	340
Queue Length 95th (ft)	36	189	66	#455
Internal Link Dist (ft)	551		305	532
Turn Bay Length (ft)				
Base Capacity (vph)	383	714	2016	1982
Starvation Cap Reductn	0	79	0	0
Spillback Cap Reductn	0	0	0	35
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.31	0.57	0.36	0.97

Intersection Summary

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

Queues
10: Washington & Center — 27/02/2009

Lane Group	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Lane Group Flow (vph)	182	346	179	997	266
v/c Ratio	0.25	0.32	0.16	0.37	0.27
Control Delay	14.9	26.2	26.2	2.4	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	14.9	26.2	26.2	2.4	2.4
Queue Length 50th (ft)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Queue Length 95th (ft)	m80	m125	m44	22	12
Internal Link Dist (ft)			345	1160	
Turn Bay Length (ft)					
Base Capacity (vph)	848	1155	1216	2696	1003
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	0.26	0.32	0.15	0.37	0.27

Intersection Summary

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

Queues
14: Lafayette & El Dorado — 27/02/2009

Lane Group	[illegible]	[illegible]	[illegible]
Lane Group Flow (vph)	505	1577	829
v/c Ratio	0.34	0.87	0.31
Control Delay	7.8	5.7	14.8
Queue Delay	5.0	1.2	0.0
Total Delay	12.8	6.9	14.8
Queue Length 50th (ft)	[illegible]	17	74
Queue Length 95th (ft)	m15	m113	95
Internal Link Dist (ft)		332	252
Turn Bay Length (ft)			
Base Capacity (vph)	813	2561	2686
Starvation Cap Reductn	150	517	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.35	0.38	0.31

Intersection Summary

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

Queues
7: Weber & Center — 27/02/2009

Lane Group	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Lane Group Flow (vph)	472	81	157	192	1397	511
v/c Ratio	0.46	0.17	0.12	0.23	0.52	0.51
Control Delay	24.8	16.3	16.7	3.9	5.8	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.8	16.3	16.7	3.9	5.8	3.2
Queue Length 50th (ft)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Queue Length 95th (ft)	144	m30	m36	36	117	53
Internal Link Dist (ft)	903		332		1414	
Turn Bay Length (ft)						
Base Capacity (vph)	992	366	1321	856	2693	1016
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	0.48	0.17	0.12	0.23	0.52	0.51

Intersection Summary

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

Queues
8: Weber & El Dorado — 27/02/2009

Lane Group	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Lane Group Flow (vph)	190	418	219	1819	292
v/c Ratio	0.41	0.34	0.26	0.86	0.33
Control Delay	12.3	10.2	14.0	13.7	1.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	12.3	10.2	14.0	13.7	1.9
Queue Length 50th (ft)	47	51	33	134	6
Queue Length 95th (ft)	75	70	61	188	m17
Internal Link Dist (ft)		302	1479	1061	
Turn Bay Length (ft)					
Base Capacity (vph)	459	1227	870	2448	886
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	0.41	0.34	0.25	0.86	0.33

Intersection Summary

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

Queues
11: Washington & El Dorado — 27/02/2009

Lane Group	[illegible]	[illegible]	[illegible]	[illegible]
Lane Group Flow (vph)	345	1844	641	332
v/c Ratio	0.75	0.55	0.74	0.86
Control Delay	27.8	15.1	34.4	55.4
Queue Delay	0.0	0.2	0.0	0.0
Total Delay	27.8	15.3	34.4	55.4
Queue Length 50th (ft)	92	204	140	385
Queue Length 95th (ft)	m110	233	221	#351
Internal Link Dist (ft)	2284	345	781	
Turn Bay Length (ft)				
Base Capacity (vph)	463	3149	868	379
Starvation Cap Reductn	0	456	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.75	0.70	0.74	0.88

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
13: Lafayette & Center — 27/02/2009

Lane Group	[illegible]	[illegible]	[illegible]	[illegible]
Lane Group Flow (vph)	157	360	712	2112
v/c Ratio	0.41	0.51	0.35	1.07
Control Delay	33.2	13.5	10.5	67.5
Queue Delay	0.0	0.4	0.0	10.5
Total Delay	33.2	13.9	10.5	77.9
Queue Length 50th (ft)	23	84	38	~448
Queue Length 95th (ft)	44	189	64	#541
Internal Link Dist (ft)	551		305	532
Turn Bay Length (ft)				
Base Capacity (vph)	387	706	2010	1977
Starvation Cap Reductn	0	81	0	0
Spillback Cap Reductn	0	0	0	45
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.41	0.57	0.36	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.

Queues
14: Lafayette & El Dorado
27/02/2009

Lane Group			
Lane Group Flow (vph)	553	1644	827
v/c Ratio	0.80	0.70	0.31
Control Delay	2.7	5.9	14.9
Queue Delay	12.4	1.8	0.0
Total Delay	31.1	7.7	14.9
Queue Length 50th (ft)	0	79	74
Queue Length 95th (ft)	m73	m102	97
Internal Link Dist (ft)		332	252
Turn Bay Length (ft)			
Base Capacity (vph)	814	2368	2595
Starvation Cap Reductn	146	518	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.86	0.89	0.31

Intersection Summary

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

Queues
10: Washington & Center
27/02/2009

Lane Group					
Lane Group Flow (vph)	195	372	568	1021	297
v/c Ratio	0.29	0.32	0.47	0.36	0.38
Control Delay	14.8	26.6	32.4	2.7	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	14.8	26.6	32.4	2.7	2.4
Queue Length 50th (ft)	38	38	153	18	0
Queue Length 95th (ft)	m58	m118	m189	24	13
Internal Link Dist (ft)			348	1102	
Turn Bay Length (ft)					
Base Capacity (vph)	647	1147	1218	2875	771
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	0.29	0.32	0.47	0.36	0.38

Intersection Summary

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

Queues
7: Weber & Center
27/02/2009

Lane Group						
Lane Group Flow (vph)	506	67	232	157	[illegible]	[illegible]
v/c Ratio	0.51	0.19	0.17	0.25	[illegible]	[illegible]
Control Delay	34.3	12.9	11.7	4.5	9.8	5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.3	12.9	11.7	4.5	9.8	5.1
Queue Length 50th (ft)	106	45	28	24	98	10
Queue Length 95th (ft)	154	m28	36	42	134	79
Internal Link Dist (ft)	901		332		1416	
Turn Bay Length (ft)						
Base Capacity (vph)	994	349	1377	664	2453	1014
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	0.19	0.17	0.25	0.56	0.41

Intersection Summary

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

Queues
8: Weber & El Dorado
27/02/2009

Lane Group					
Lane Group Flow (vph)	192	432	301	1554	292
v/c Ratio	0.46	0.38	0.38	0.64	0.33
Control Delay	14.5	10.4	19.2	12.7	1.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	14.5	10.4	19.2	12.7	1.8
Queue Length 50th (ft)	47	62	57	122	3
Queue Length 95th (ft)	93	71	91	m156	m15
Internal Link Dist (ft)		332	1478	1061	
Turn Bay Length (ft)					
Base Capacity (vph)	420	1139	872	2446	886
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	0.46	0.38	0.35	0.64	0.33

Intersection Summary

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

Queues
11: Washington & El Dorado
27/02/2009

Lane Group				
Lane Group Flow (vph)	370	1952	800	372
v/c Ratio	0.79	0.83	0.90	0.98
Control Delay	30.0	15.3	45.2	75.3
Queue Delay	0.0	0.3	0.0	0.0
Total Delay	30.0	15.6	45.2	75.3
Queue Length 50th (ft)	86	222	212	216
Queue Length 95th (ft)	m#124	254	#319	#408
Internal Link Dist (ft)	2264	345	781	
Turn Bay Length (ft)				
Base Capacity (vph)	469	3108	887	379
Starvation Cap Reductn	0	452	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.79	0.73	0.90	0.98

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
13: Lafayette & Center
27/02/2009

Lane Group				
Lane Group Flow (vph)	126	651	1000	747
v/c Ratio	0.25	0.61	0.36	0.70
Control Delay	27.2	4.5	5.0	34.3
Queue Delay	0.0	0.2	0.0	0.0
Total Delay	27.2	4.7	5.0	34.3
Queue Length 50th (ft)	34	22	41	129
Queue Length 95th (ft)	33	43	50	167
Internal Link Dist (ft)	561		365	532
Turn Bay Length (ft)				
Base Capacity (vph)	662	1074	2832	1164
Starvation Cap Reductn	0	77	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.35	0.65	0.35	0.64

Intersection Summary

Queues
10: Washington & Center
27/02/2009

Lane Group					
Lane Group Flow (vph)	259	980	76	1772	519
v/c Ratio	0.42	0.86	0.06	0.66	0.67
Control Delay	14.4	25.8	13.2	3.8	8.1
Queue Delay	0.0	1.4	0.0	0.0	0.0
Total Delay	14.4	27.2	13.2	3.8	8.1
Queue Length 50th (ft)	95	270	13	67	43
Queue Length 95th (ft)	m112	m282	m14	71	m61
Internal Link Dist (ft)			348	1102	
Turn Bay Length (ft)					
Base Capacity (vph)	633	1179	1216	2696	773
Starvation Cap Reductn	0	75	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.41	0.89	0.06	0.66	0.67

Intersection Summary

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

Queues
14: Lafayette & El Dorado
27/02/2009

Lane Group			
Lane Group Flow (vph)	337	1048	1148
v/c Ratio	0.81	0.44	0.32
Control Delay	29.5	30.3	9.7
Queue Delay	0.0	0.0	0.0
Total Delay	29.5	30.3	9.7
Queue Length 50th (ft)	174	199	75
Queue Length 95th (ft)	177	157	128
Internal Link Dist (ft)		332	252
Turn Bay Length (ft)			
Base Capacity (vph)	786	2401	3652
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.43	0.43	0.32

Intersection Summary

Queues
7: Weber & Center
27/02/2009

Lane Group						
Lane Group Flow (vph)	1059	143	253	174	1708	350
v/c Ratio	0.84	0.57	0.22	0.25	0.84	0.42
Control Delay	33.5	34.8	6.5	8.9	18.1	1.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.5	34.8	6.5	8.9	18.1	1.5
Queue Length 50th (ft)	287	58	12	27	306	0
Queue Length 95th (ft)	#365	m102	m24	44	368	0
Internal Link Dist (ft)	901		332		1416	
Turn Bay Length (ft)						
Base Capacity (vph)	1236	250	1129	708	2034	828
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	0.86	0.57	0.22	0.25	0.84	0.42

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: Weber & El Dorado
27/02/2009

Lane Group	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Lane Group Flow (vph)	258	545	406	2290	149
v/c Ratio	0.59	0.53	0.48	0.88	0.18
Control Delay	13.3	7.4	26.1	10.4	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	13.3	7.4	26.1	10.4	0.3
Queue Length 50th (ft)	17	29	96	133	3
Queue Length 95th (ft)	m23	m28	141	m144	m0
Internal Link Dist (ft)		332	1479	1061	
Turn Bay Length (ft)					
Base Capacity (vph)	347	1026	847	2596	839
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	0.56	0.53	0.48	0.88	0.18

Intersection Summary

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

Queues
11: Washington & El Dorado
27/02/2009

Lane Group	[illegible]	[illegible]	[illegible]	[illegible]
Lane Group Flow (vph)	1109	1562	566	311
v/c Ratio	1.02	0.62	1.11dr	1.23
Control Delay	56.9	19.3	53.9	165.9
Queue Delay	0.0	0.0	11.2	0.0
Total Delay	56.9	19.3	65.1	165.9
Queue Length 50th (ft)	~324	218	138	~228
Queue Length 95th (ft)	#482	155	#225	#400
Internal Link Dist (ft)	2284	345	781	
Turn Bay Length (ft)				
Base Capacity (vph)	1092	2513	571	253
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	54	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.02	0.62	0.98	1.23

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.

Queues
13: Lafayette & Center
27/02/2009

Lane Group	[illegible]	[illegible]	[illegible]	[illegible]
Lane Group Flow (vph)	261	651	1009	754
v/c Ratio	0.43	0.66	0.37	0.71
Control Delay	33.0	7.3	5.2	34.4
Queue Delay	0.0	0.3	0.0	0.0
Total Delay	33.0	7.7	5.2	34.4
Queue Length 50th (ft)	43	36	41	130
Queue Length 95th (ft)	84	72	49	168
Internal Link Dist (ft)	551		305	532
Turn Bay Length (ft)				
Base Capacity (vph)	664	986	2727	1164
Starvation Cap Reductn	0	65	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.39	0.71	0.37	0.65

Intersection Summary

Queues
14: Lafayette & El Dorado
27/02/2009

Lane Group	[illegible]	[illegible]	[illegible]
Lane Group Flow (vph)	372	1144	1149
v/c Ratio	0.43	0.64	0.34
Control Delay	27.5	28.4	11.1
Queue Delay	0.0	0.0	0.0
Total Delay	27.5	28.4	11.1
Queue Length 50th (ft)	202	225	81
Queue Length 95th (ft)	172	151	136
Internal Link Dist (ft)		332	252
Turn Bay Length (ft)			
Base Capacity (vph)	796	2436	3411
Starvation Cap Reductn	16	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.45	0.47	0.34

Intersection Summary

Queues
13: Lafayette & Center
27/02/2009

Lane Group	[illegible]	[illegible]	[illegible]	[illegible]
Lane Group Flow (vph)	261	651	1009	754
v/c Ratio	0.43	0.66	0.37	0.71
Control Delay	33.0	7.3	5.2	34.4
Queue Delay	0.0	0.3	0.0	0.0
Total Delay	33.0	7.7	5.2	34.4
Queue Length 50th (ft)	43	36	41	130
Queue Length 95th (ft)	84	72	49	168
Internal Link Dist (ft)	551		305	532
Turn Bay Length (ft)				
Base Capacity (vph)	664	986	2727	1164
Starvation Cap Reductn	0	65	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.39	0.71	0.37	0.65

Intersection Summary

Queues
10: Washington & Center
27/02/2009

Lane Group	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Lane Group Flow (vph)	259	1009	84	1772	519
v/c Ratio	0.42	0.88	0.07	0.66	0.67
Control Delay	14.7	27.2	13.6	3.9	0.3
Queue Delay	0.0	1.9	0.0	0.0	0.0
Total Delay	14.7	29.1	13.6	3.9	0.3
Queue Length 50th (ft)	96	279	14	65	50
Queue Length 95th (ft)	m112	m293	m16	m80	m60
Internal Link Dist (ft)			348	1102	
Turn Bay Length (ft)					
Base Capacity (vph)	633	1179	1216	2686	770
Starvation Cap Reductn	0	72	0	0	0
Spillback Cap Reductn	0	0	0	17	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.41	0.91	0.07	0.66	0.67

Intersection Summary

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

Queues
11: Washington & El Dorado
27/02/2009

Lane Group	[illegible]	[illegible]	[illegible]	[illegible]
Lane Group Flow (vph)	1109	1579	515	311
v/c Ratio	1.02	0.63	1.11dr	1.23
Control Delay	56.9	16.5	56.3	165.9
Queue Delay	0.0	0.0	17.0	0.0
Total Delay	56.9	16.5	73.3	165.9
Queue Length 50th (ft)	~324	198	140	~228
Queue Length 95th (ft)	#482	148	#229	#400
Internal Link Dist (ft)	2284	345	781	
Turn Bay Length (ft)				
Base Capacity (vph)	1092	2513	572	253
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	1	64	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.02	0.63	1.01	1.23

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.