APPENDIX D

Traffic Impact Study for Proposed Madera Quarry, Peters Engineering Group, dated October 13, 2009

Traffic Impact Study

Proposed Madera Quarry

Road 209 West of State Route 41

Madera County, California

Prepared For:

Madera Quarry, Inc.
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Date:

October 13, 2009

Job No.:

08-066.01

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October 13, 2009

Subject: Traffic Impact Study
Proposed Madera Quarry
Road 209 West of State Route 41
Madera County, California

Introduction

This report presents the results of a traffic impact study for the proposed Madera Quarry (hereinafter referred to as "Project") in Madera County, California. This analysis focuses on the anticipated effect on vehicle traffic resulting from the Project. This report addresses the concerns expressed by the Court of Appeal in its opinion in Gray v. County of Madera et. al. The information presented in this report is intended to supplement the previous traffic analyses presented in an Environmental Impact Report (EIR) for the Madera Ranch Quarry dated June 2005 to the extent that assumptions, requirements, and data have changed since 2005.

To present an adequate update of the traffic analysis, the scope of the study and the baseline conditions were revisited and updated. The scope of the study was determined in coordination with County of Madera and Caltrans staff. The affected agencies did not require updated traffic analyses at certain locations that were analyzed in the June 2005 EIR and were found to have no Project impacts. The intersection analyses not updated herein include:

- State Route (SR) 41 / Road 406;
- SR 145 / Road 400;
- SR 145 / Cleveland Avenue;
- Cleveland Avenue / SR 99 northbound ramps; and
- Cleveland Avenue / SR 99 southbound ramps.

The road segment analyses not updated herein include:

- State Route 41 (Road 406 to Road 200);
- State Route 145 (Road 400 to Cleveland Avenue); and
- Cleveland Avenue (SR 145 to SR 99).

Differences between the previous analyses and those presented herein are primarily a result of the updated baseline conditions, which include (but are not limited to) new traffic counts, changes in intersection configurations, and the application of passenger car equivalents to the Project traffic volumes.

Project Description

The Project, which will employ 15 to 20 people, consists of a proposed 121-acre hardrock quarry including processing facilities and hot-mix asphalt plant. Maximum marketed output at the site will be 900,000 tons per year. Aggregate material produced at the Project site will typically be hauled in 25-ton-capacity trucks. It is estimated that the Project will produce approximately 3,825 tons of material on the average workday and 8,525 tons of material on the maximum workday. Typical operating hours of the processing facilities and hot-mix asphalt plant will be from 6:00 a.m. to 7:00 p.m., Monday through Friday. The Project is expected to realign and/or reconstruct a majority of Road 209 between the site and State Route (SR) 41. A Vicinity Map is presented as Figure 1 in Attachment 2.

Study Area and Time Period

The study intersections and road segments were determined in coordination with County of Madera and Caltrans staff based on the anticipated Project traffic distribution. This report includes analysis of the following intersections:

- SR 41 and Road 209;
- SR 41 and SR 145;
- SR 41 and Avenue 15;
- SR 41 and Avenue 14½ / Road 204; and
- SR 41 and Avenue 12.

This report also includes operational analysis of the following road segments:

- SR 41 between Road 209 and Road 406;
- SR 41 between SR 145 and Road 209;
- SR 41 between Avenue 15 and SR 145;
- SR 41 between Avenue 14½/Road 204 and Avenue 15
- SR 41 between Avenue 12 and Avenue 14½/Road 204; and
- SR 145 between SR 41 and Road 400.

The study time periods include the weekday a.m. and p.m. peak hours determined between 7:00 and 9:00 a.m. and between 4:00 and 6:00 p.m. The weekday peak hours represent the worst-case baseline conditions. The peak hours were analyzed for the following conditions:

- Existing Conditions;
- Existing Plus Project Conditions;
- 2030 Cumulative No-Project Conditions; and
- 2030 Cumulative With-Project Conditions.

Lane Configurations and Intersection Control

The existing lane configurations and intersection control at the study intersections are illustrated in Figure 2, Existing Lane Configurations. The assumed year 2030 lane configurations and intersection control are presented in Figure 3, Cumulative Lane Configurations.

Trip Generation

Aggregate material produced at the Project site will typically be hauled in 25-ton-capacity trucks. It is estimated that the Project will produce approximately 3,825 tons of marketed material on the average workday and 8,525 tons of marketed material on the maximum workday. The trip generation information is provided in Table 1, Project Trip Generation. The values presented in Table 1 include trucks accessing the asphalt batch plant.

Table 1
Project Trip Generation

Time Period	Entering Site	Trucks Exiting Site
Average Workday	153 trucks 20 employee vehicles	153 trucks 20 employee vehicles
Maximum Workday	341 trucks 20 employee vehicles	341 trucks 20 employee vehicles
Maximum Weekday A.M. Peak Hour	50 trucks	50 trucks
Maximum Weekday P.M. Peak Hour	20 trucks	20 trucks

The peak hour estimates do not include employee traffic, which is expected to occur during off-peak hours. The estimated percentage distribution of annual average project traffic is presented in Figure 4, Project Traffic Distribution Percentage. The project traffic volumes at each of the study intersections are presented in Figure 5, Opening Day Project Traffic Volumes, and Figure 6, Ultimate Project Traffic Volumes. The trip generation values represented in Figures 5 and 6 are the same. The difference between the two figures is the configuration of future interchanges.

Passenger car equivalents (PCE) represent the number of passenger cars displaced by a single heavy vehicle (trucks with 3 axles or more) under certain roadway, traffic, and control conditions. The use of PCEs compensates for the operational characteristics of heavy vehicles as well as the roadway space displaced. Use of PCEs in the traffic analysis generally results in recommendations for wider roadways and intersections, which increase the capacity of the facilities and provide for better operating conditions and enhanced safety for the traveling public.

The Transportation Research Board *Highway Capacity Manual*, 2000 (HCM) recommends a PCE factor of 2.0 for heavy vehicles, which is an average for all heavy vehicle sizes. Based on the type of aggregate transfer trucks that will be utilized for this operation (i.e. 25-ton capacity 5-axle truck), a greater PCE factor is reasonable because these trucks are long, heavy, accelerate more slowly, and require more distance to decelerate. A PCE of 2.5 was applied to the Project traffic volumes. The project traffic volumes, adjusted for PCEs, are presented in Figure 7, Opening Day PCE Project Traffic Volumes, and Figure 8, Ultimate PCE Project Traffic Volumes.

Existing and Existing-Plus-Project Traffic Volumes

Existing traffic volumes were determined by performing manual turning movement counts at the study intersections between 7:00 and 9:00 a.m. and between 4:00 and 6:00 p.m. on a weekday. The traffic count data sheets are included in Attachment 3. The existing peak-hour turning movement volumes are presented in Figure 9, Existing Peak-Hour Traffic

Volumes. Existing-plus-Project traffic volumes, with PCE adjustments, are presented in Figure 10, Existing Plus Project Peak-Hour Traffic Volumes.

Cumulative Year 2030 Traffic Volumes

Cumulative year 2030 traffic volume forecasts without the Project were estimated based on the cumulative 2030 Madera County travel model maintained by the Madera County Transportation Commission (MCTC) using an increment method. The MCTC is located at 2001 Howard Road, Suite 201, Madera, California 93637. The documentation for the Madera County travel model is presented in documents dated November 1, 2001 and October 6, 2006 which are available from the MCTC by request. The increment method projects future traffic volumes by adding the growth projected by the model to the existing traffic volumes. The year 2000 and 2030 model traffic volumes used in the increment method are included in Attachment 4. Future turning movements were estimated based on the methods presented in Chapter 8 of the Transportation Research Board National Cooperative Highway Research Program Report 255 entitled "Highway Traffic Data for Urbanized Area Project Planning and Design." Projected year 2030 cumulative no-Project traffic volumes are presented in Figure 11, Cumulative 2030 No-Project Peak-Hour Traffic Volumes. The 2030 cumulative-with-Project traffic volumes are presented in Figure 12, Cumulative 2030 With-Project Peak-Hour Traffic Volumes.

Significance Criteria

The HCM defines level of service (LOS) as a qualitative measure describing operational characteristics within a traffic stream, based on service measures such as speed and travel time, freedom to maneuver, traffic interruptions, comfort, and convenience. LOS characteristics for both unsignalized and signalized intersections are presented in Tables 2 and 3, respectively. Level-of-service characteristics for road segments are presented in Table 4.

Table 2
Level of Service Characteristics for Unsignalized Intersections

Level of Service	Description	Average Vehicle Delay (seconds)
A	Little or no delay.	0-10
B	Short traffic delays.	>10-15
C	Average traffic delays.	>15-25
D	Long traffic delays.	>25-35
E	Very long traffic delays.	>35-50
F	Stop-and-go conditions.	>50

Reference: *Highway Capacity Manual,* Transportation Research Board

Table 3
Level of Service Characteristics for Signalized Intersections

Level of Service	Description	Average Vehicle Delay (seconds)
A	Uncongested operations; all queues clear in a single cycle.	≤10
B	Very light congestion; an occasional phase is fully utilized.	>10-20
C	Light congestion; occasional queues on approaches.	>20-35
D	Significant congestion on critical approaches, but intersection is functional. Cars required to wait through more than one cycle during short peaks. No long-standing queues formed.	>35-55
E	Severe congestion with some long-standing queues on critical approaches. Traffic queue may block nearby intersection(s) upstream of critical approach(es).	>55-80
F	Total breakdown, stop-and-go conditions.	>80

Reference: *Highway Capacity Manual,* Transportation Research Board

Table 4
Level of Service Characteristics for Road Segments

Level of Service	Description
A	Primarily free flow operations
B	Reasonably unimpeded operations, ability to maneuver only slightly restricted
C	Stable operations, ability to maneuver and select operating speed affected
D	Unstable flow, speeds and ability to maneuver restricted
E	Significant delays, flow quite unstable
F	Extremely slow speeds

Reference: 1998 *Highway Capacity Manual,* Transportation Research Board

A traffic impact is considered significant if it renders an unacceptable LOS on a street segment or signalized intersection, or if it worsens already unacceptable conditions on a street or at a signalized intersection. According to LOS Policy 2.A.8 in the Transportation and Circulation Section of the General Plan Policy Document, the County shall develop and manage its roadway system to maintain a minimum LOS of D on all State and County roadways.

Caltrans typically requires that LOS C or better be maintained on State facilities. However, where an intersection experiences a LOS below C, warrants for all-way stop control or traffic signals as described in the State of California Department of Transportation *California Manual on Uniform Traffic Control Devices for Streets and Highways* dated September 26, 2006 (CMUTCD) must be satisfied before such improvements are allowed.

The CMUTCD presents criteria (warrants) for determining the need for traffic signals and provides criteria for eight-hour volume, four-hour volume, peak-hour volume, pedestrian volume, coordinated systems, crash experience, and roadway network. The CMUTCD also indicates that satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal. Significant engineering judgment is required by the CMUTCD in the application of the warrants. A traffic control signal should not be installed unless an engineering study indicates that installing a traffic control signal will improve the overall safety and/or operation of the intersection.

Caltrans does not allow installation of a traffic signal at an unsignalized intersection operating at substandard LOS if traffic signal warrants are not satisfied. Under these conditions, the only means to alleviate delays to stop-controlled vehicles may be to install a traffic signal. However, the unsatisfied signal warrants suggest that the reduction in delay for the stop-controlled vehicles does not justify the new delays that would be incurred by the major street traffic (which at one-way or two-way stop-controlled intersections is not currently required to stop). Under these circumstances, Caltrans does not recommend installation of a signal.

Intersection Analyses

The LOS at the study intersections was determined using the computer program Synchro 6 (Build 614), which is based on the HCM procedures for calculating LOS. The Caltrans *Guide for the Preparation of Traffic Impact Studies* dated December 2002 identifies Synchro as an acceptable analysis tool. Tables 5 through 8 present the results of the intersection analyses. The LOS is typically presented for the overall intersection. The HCM does not define the overall intersection LOS for one-way stop-sign controlled intersections. Therefore, the LOS for the approach with the greatest delay is presented for one-way stop-sign controlled intersections. The analysis output is included in Attachment 5. For the existing conditions and cumulative no-project conditions, deficient intersection LOS is indicated in bold type. For Project scenarios, only Project impacts are indicated in bold type.

The CMUTCD presents various warrant analyses to assist in evaluating the need for traffic signals at an intersection. Figure 4C-4, Warrant 3, Peak Hour (70% Factor), of the CMUTCD was utilized to evaluate the possibility that traffic signals may be warranted at deficient unsignalized study intersections. Peak-hour traffic signal warrant studies are performed only for cases in which the unsignalized intersection operates at a deficient LOS. The warrant analysis sheets are included in Attachment 6.

Key to Tables 5 through 8

OWS:	One-way stop control	DNE:	Does not exist
TWS:	Two-way stop control	n/r:	Analysis not required

Table 5
Intersection Analysis Summary - Existing Conditions

Intersection	Control Type	A.M. Peak Hour			P.M. Peak Hour		
		Delay (sec)	LOS	Peak Hour Warrant	Delay (sec)	LOS	Peak Hour Warrant
SR 41 / Road 209	OWS	14.2	B	n/r	11.1	B	n/r
SR 41 / SR 145	Signal	16.5	B	n/r	20.7	C	n/r
SR 41 / Ave 15	OWS	**42.6**	**E**	Not met*	**81.7**	**F**	Not met*
SR 41 / Ave 14½ / Road 204	TWS	**51.6**	**F**	Not met	**53.8**	**F**	Not met
SR 41 / Ave 12	Signal	**35.7**	**D**	n/r	**50.5**	**D**	n/r

* See discussion regarding right-turn volumes

Table 6
Intersection Analysis Summary - Existing Plus Project Conditions

Intersection	Control Type	A.M. Peak Hour			P.M. Peak Hour		
		Delay (sec)	LOS	Peak Hour Warrant	Delay (sec)	LOS	Peak Hour Warrant
SR 41 / Road 209	OWS	22.7	C	n/r	13.6	B	n/r
SR 41 / SR 145	Signal	16.5	B	n/r	19.9	B	n/r
SR 41 / Ave 15	OWS	**60.4**	**F**	Not met*	94.9	F	Not met*
SR 41 / Ave 14½ / Road 204	TWS	55.9	F	Not met	52.8	F	Not met
SR 41 / Ave 12	Signal	37.0	D	n/r	52.1	D	n/r

* See discussion regarding right-turn volumes

Table 7
Intersection Analysis Summary – 2030 Cumulative No-Project Conditions

Intersection	Control Type	A.M. Peak Hour			P.M. Peak Hour		
		Delay (sec)	LOS	Peak Hour Warrant	Delay (sec)	LOS	Peak Hour Warrant
SR 41 / Road 209	OWS	**301.7**	**F**	2/2	*****	**F**	2/2
SR 41 / SR 145	Signal	**251.0**	**F**	n/r	**433.6**	**F**	n/r
SR 41 SB / Ave 15	Signal	7.5	A	n/r	8.7	A	n/r
SR 41 NB / Ave 15	Signal	17.2	B	n/r	31.0	C	n/r
SR 41 / Ave 14½ / Road 204	DNE	-	-	n/r	-	-	n/r
SR 41 SB / Ave 12	Signal	29.3	C	n/r	**36.3**	**D**	n/r
SR 41 NB / Ave 12	Signal	18.3	B	n/r	28.8	C	n/r

* Excessive delays not reported

Table 8
Intersection Analysis Summary – 2030 Cumulative With-Project Conditions

Intersection	Control Type	A.M. Peak Hour			P.M. Peak Hour		
		Delay (sec)	LOS	Peak Hour Warrant	Delay (sec)	LOS	Peak Hour Warrant
SR 41 / Road 209	OWS	*****	**F**	2/2	*****	**F**	2/2
SR 41 / SR 145	Signal	**270.7**	**F**	n/r	**439.0**	**F**	n/r
SR 41 SB / Ave 15	Signal	7.6	A	n/r	8.8	A	n/r
SR 41 NB / Ave 15	Signal	17.2	B	n/r	31.0	C	n/r
SR 41 / Ave 14½ / Road 204	DNE	-	-	n/r	-	-	n/r
SR 41 SB / Ave 12	Signal	29.6	C	n/r	36.4	D	n/r
SR 41 NB / Ave 12	Signal	18.2	B	n/r	28.7	C	n/r

* Excessive delays not reported

Road Segment Analyses

Roadway LOS characteristics are presented in Table 9 and are taken from the Madera County General Plan Policy Document. The results of the road segment analyses are presented in Tables 10 through 13.

Table 9
Capacities Per Hour Per Lane for Various Highway Facilities in Madera County

Level of Service	Freeways	Two-Lane Rural Highway	Multi-Lane Rural Highway	Expressway	Arterial	Collector
A	700	120	470	720	450	300
B	1,100	240	945	840	525	350
C	1,550	395	1,285	960	600	400
D	1,850	675	1,585	1,080	675	450
E	2,000	1,145	1,800	1,200	750	500

Table 10
Road Segment LOS Summary – Existing Conditions

Road and Direction Segment	Facility Type	Lanes	A.M. Peak Hour		P.M. Peak Hour	
			Volume	LOS	Volume	LOS
SR 41 Northbound						
Rd 209 to Rd 406	2-Lane Rural Highway	1	243	C	634	**D**
SR 145 to Rd 209	2-Lane Rural Highway	1	316	C	920	**E**
Ave 15 to SR 145	2-Lane Rural Highway	1	264	C	815	**E**
Ave 14½ to Ave 15	2-Lane Rural Highway	1	344	C	1,045	**E**
Ave 12 to Ave 14½	2-Lane Rural Highway	1	373	C	1,146	**F**
SR 41 Southbound						
Rd 406 to Rd 209	2-Lane Rural Highway	1	627	**D**	435	**D**
Rd 209 to SR 145	2-Lane Rural Highway	1	811	**E**	456	**D**
SR 145 to Ave 15	2-Lane Rural Highway	1	797	**E**	422	**D**
Ave 15 to Ave 14½	2-Lane Rural Highway	1	1,013	**E**	520	**D**
Ave 14½ to Ave 12	2-Lane Rural Highway	1	1,195	**F**	554	**D**
SR 145 Westbound						
SR 41 to Rd 400	2-Lane Rural Highway	1	138	B	177	B
SR 145 Eastbound						
Rd 400 to SR 41	2-Lane Rural Highway	1	179	B	302	C

Table 11
Road Segment LOS Summary – Existing Plus Project Conditions

Road and Direction	Facility Type	Lanes	A.M. Peak Hour		P.M. Peak Hour	
Segment			Volume	LOS	Volume	LOS
SR 41 Northbound						
Rd 209 to Rd 406	2-Lane Rural Highway	1	248	C	636	D
SR 145 to Rd 209	2-Lane Rural Highway	1	361	C	938	E
Ave 15 to SR 145	2-Lane Rural Highway	1	296	C	828	E
Ave 14½ to Ave 15	2-Lane Rural Highway	1	376	C	1,058	F
Ave 12 to Ave 14½	2-Lane Rural Highway	1	402	D	1,158	F
SR 41 Southbound						
Rd 406 to Rd 209	2-Lane Rural Highway	1	632	D	437	D
Rd 209 to SR 145	2-Lane Rural Highway	1	856	E	474	D
SR 145 to Ave 15	2-Lane Rural Highway	1	829	E	435	D
Ave 15 to Ave 14½	2-Lane Rural Highway	1	1,045	E	534	D
Ave 14½ to Ave 12	2-Lane Rural Highway	1	1,224	F	566	D
SR 145 Westbound						
SR 41 to Rd 400	2-Lane Rural Highway	1	148	B	181	B
SR 145 Eastbound						
Rd 400 to SR 41	2-Lane Rural Highway	1	189	B	306	C

Table 12
Road Segment LOS Summary – Cumulative 2030 No-Project Conditions

Road and Direction	Facility Type	Lanes	A.M. Peak Hour		P.M. Peak Hour	
Segment			Volume	LOS	Volume	LOS
SR 41 Northbound						
Rd 209 to Rd 406	2-Lane Rural Highway	1	686	**E**	1,409	**F**
SR 145 to Rd 209	2-Lane Rural Highway	1	813	**E**	1,597	**F**
Ave 15 to SR 145	2-Lane Rural Highway	1	1,491	**F**	2,663	**F**
Ave 12 to Ave 15	Freeway	2	3,265	**D**	4,223	**F**
SR 41 Southbound						
Rd 406 to Rd 209	2-Lane Rural Highway	1	1,252	**F**	1,029	**E**
Rd 209 to SR 145	2-Lane Rural Highway	1	1,422	**F**	1,229	**F**
SR 145 to Ave 15	2-Lane Rural Highway	1	2,396	**F**	2,022	**F**
Ave 15 to Ave 12	Freeway	2	4,126	**F**	3,223	**D**
SR 145 Westbound						
SR 41 to Rd 400	2-Lane Rural Highway	1	719	**E**	912	**E**
SR 145 Eastbound						
Rd 400 to SR 41	2-Lane Rural Highway	1	761	**E**	940	**E**

Table 13
Road Segment LOS Summary – Cumulative 2030 With-Project Conditions

Road and Direction	Facility Type	Lanes	A.M. Peak Hour		P.M. Peak Hour	
Segment			Volume	LOS	Volume	LOS
SR 41 Northbound						
Rd 209 to Rd 406	2-Lane Rural Highway	1	691	E	1,411	F
SR 145 to Rd 209	2-Lane Rural Highway	1	858	E	1,608	F
Ave 15 to SR 145	2-Lane Rural Highway	1	1,523	F	2,676	F
Ave 12 to Ave 15	Freeway	2	3,294	D	4,235	F
SR 41 Southbound						
Rd 406 to Rd 209	2-Lane Rural Highway	1	1,257	F	1,031	E
Rd 209 to SR 145	2-Lane Rural Highway	1	1,467	F	1,224	F
SR 145 to Ave 15	2-Lane Rural Highway	1	2,428	F	2,035	F
Ave 15 to Ave 12	Freeway	2	4,158	F	3,234	D
SR 145 Westbound						
SR 41 to Rd 400	2-Lane Rural Highway	1	729	E	916	E
SR 145 Eastbound						
Rd 400 to SR 41	2-Lane Rural Highway	1	771	E	944	E

Discussion

Existing Conditions

The results of the existing-conditions analyses indicate that the following intersections are currently operating at deficient LOS:

- SR 41 and Avenue 15 (peak-hour traffic signal warrants not met, see below);
- SR 41 and Avenue 14½ / Road 204 (peak-hour traffic signal warrants not met); and
- SR 41 and Avenue 12.

The results of the existing-conditions analyses indicate that all of the study road segments on SR 41 are currently operating at deficient LOS.

Peak-hour traffic signals warrants appear to be satisfied at the intersection of SR 41 and Avenue 15 based on approach volumes. However, the CMUTCD provides the following discussions related to intersections such as SR 41 and Avenue 15 where a majority of the minor street traffic is making right turns:

- The study should consider the effects of the right-turn vehicles from the minor-street approaches. Engineering judgment should be used to determine what, if any, portion of the right-turn traffic is subtracted from the minor-street traffic count when evaluating the count against the signal warrants.

- Similar engineering judgment and rationale should be applied to a street approach with one lane plus a right-turn lane. In this case, the degree of conflict of minor-street right-turn traffic with traffic on the major street should be considered. Thus, right-turn traffic should not be included in the minor-street volume if the movement enters the major street with minimal conflict. The approach should be evaluated as a one-lane approach with only the traffic volume in the through/left-turn lane considered.

Considering these criteria the existing conditions at the intersection of SR 41 and Avenue 15 may be nearing the point at which traffic signals would be warranted. However, peak-hour traffic signal warrants are not clearly met and therefore traffic signals are not warranted at this time.

It is noted that the certain study locations that were included in the June 2005 EIR for Project were previously determined to operate at deficient LOS, but the affected agencies did not require updated traffic analyses since the June 2005 EIR found no Project impacts and the Project generates low traffic volumes at those locations. The previously deficient locations are:

- Intersection of SR 41 and Road 406;
- Intersection of Cleveland Avenue and SR 99 northbound ramps;
- State Route 41 road segment between Road 406 to Road 200);
- State Route 145 (Road 400 to Cleveland Avenue); and
- Cleveland Avenue (SR 145 to SR 99).

Existing Plus Project Conditions

The existing-plus-Project conditions represent the anticipated conditions if the Project were to open immediately with maximum production. The results of the existing-plus-Project conditions analyses indicate that the Project will create a significant impact at the intersection of SR 41 and Avenue 15 by reducing the LOS from E to F. The Project does not create significant impacts at the other study locations.

There are no feasible mitigation measures to mitigate the Project's impact at the intersection of SR 41 and Avenue 15. Installation of all-way stop control is not feasible due to the significant delays that would result on SR 41. The addition of lanes is not feasible since it would not alleviate the delays for stop-controlled vehicles turning across traffic from Avenue 15 to SR 41. Finally, traffic signal warrants are not clearly satisfied and would cause new delays on the SR 41 mainline, rendering the installation of traffic signals an infeasible mitigation. Therefore, this impact is considered significant and unavoidable. Eventually, as traffic volumes in the region increase as a result of further development, warrants for traffic signals are expected to be satisfied and traffic signals will be required to be installed by future development projects. The Project can mitigate its equitable share of the impact with payment of an equitable share contribution as discussed later in this report.

Year 2030 Cumulative No-Project Conditions

The results of the year 2030 cumulative no-Project conditions analyses are based on the lane configurations and intersection control presented in Figure 3. These improvements include an interchange on SR 41 at Avenue 15, an interchange on SR 41 at Avenue 12, and elimination of the intersection of SR 41 and Avenue 14½.

The following intersections are expected to operate at deficient LOS:

- SR 41 and Road 209 (peak-hour traffic signal warrants met);
- SR 41 and SR 145; and
- SR 41 southbound ramps and Avenue 12.

The traffic volumes projected at the intersection of SR 41 and SR 145 suggest that an interchange will be required at this location.

It should be noted that the analysis suggests that the assumed lane configurations at the SR 41 southbound ramps at Avenue 12 will operate near the transition between LOS C and LOS D. The actual design criteria acceptable to Caltrans may differ from that assumed herein and a LOS D may be considered acceptable to Caltrans if the intersection is designed to accommodate the associated queues.

The results of the 2030 cumulative no-Project conditions road segment analyses indicate that all of the study road segments on SR 41 and SR 145 are expected to operate at deficient LOS.

It should be noted that Caltrans has indicated that traffic signals are not desirable at the intersection of SR 41 and Road 209 due to the close spacing between Road 209 and SR 145. Therefore, future signalization of the intersection is recommended only if the need is well established based on future studies.

Year 2030 Cumulative With-Project Conditions

The results of the year 2030 cumulative with-Project conditions analyses indicate that the Project will create a significant impact at the intersection of SR 41 and Road 209 by exacerbating conditions that are expected to be deficient without the Project. Since Caltrans has indicated that traffic signals are not desirable at the intersection of SR 41 and Road 209 due to the close spacing between Road 209 and SR 145, traffic signals are not recommended as a feasible mitigation. Further, since the need for traffic signals at the intersection is caused almost entirely by hypothetical commercial development near the intersection, the Project's share of the cumulative impact is minimal and will become significant and unavoidable if the LOS at the intersection ever drops below LOS C. The Project can mitigate its share of the cumulative significant impacts by paying an equitable share of the cost of improvements required by Caltrans.

The Project will also be responsible to mitigate its equitable share of the cumulative significant impacts that can be mitigated with construction of the future interchanges on SR 41 at Avenue 12, Avenue 15, and SR 145. The Project can mitigate its equitable share with payment of the appropriate County and Caltrans traffic impact fees. The Project can also mitigate its impact by constructing a portion of the improvements described in Table 14. The cost of the construction shall be credited against the Project's equitable share. If any of the mitigations are not fully funded by the fee program then the impact at that location would remain significant and unavoidable. Equitable share calculations are presented later in this report.

The Project will contribute traffic to cumulative significant impacts to road segments that will require the following mitigations:

- SR 41 between Road 209 and Road 406: widen to four lanes.
- SR 41 between SR 145 and Road 209: widen to four lanes.
- SR 41 between Avenue 15 and SR 145: convert to four-lane freeway.
- SR 41 between Avenue 12 and Avenue 15: convert to four-lane freeway.
- SR 145 between SR 41 and Road 400: widen to four lanes.

The mitigated road segment LOS are presented in Table 14.

Table 14
Mitigated Road Segment LOS Summary – Cumulative 2030 With-Project Conditions

Road and Direction	Facility Type	Lanes	A.M. Peak Hour		P.M. Peak Hour	
Segment			Volume	LOS	Volume	LOS
SR 41 Northbound						
Rd 209 to Rd 406	4-Lane Rural Highway	2	691	A	1,411	B
SR 145 to Rd 209	4-Lane Rural Highway	2	858	A	1,608	B
Ave 15 to SR 145	4-Lane Freeway	2	1,523	B	2,676	C
Ave 12 to Ave 15	6-Lane Freeway	3	3,294	B	4,235	C
SR 41 Southbound						
Rd 406 to Rd 209	4-Lane Rural Highway	2	1,257	B	1,031	B
Rd 209 to SR 145	4-Lane Rural Highway	2	1,467	B	1,224	B
SR 145 to Ave 15	4-Lane Freeway	2	2,428	C	2,035	B
Ave 15 to Ave 12	6-Lane Freeway	3	4,158	C	3,234	B
SR 145 Westbound						
SR 41 to Rd 400	4-Lane Rural Highway	2	729	A	916	A
SR 145 Eastbound						
Rd 400 to SR 41	4-Lane Rural Highway	2	771	A	944	B

Since the Project contributes to the cumulative regional significant impacts to road segments, the Project can mitigate its equitable share with payment of the appropriate County and Caltrans traffic impact fees. If any of these mitigations are not fully funded by the fee program then the impact at that location would remain significant and unavoidable. Equitable share calculations are presented later in this report.

Equitable Share Calculations

Where required future mitigations are not included in established development fees and are not the sole responsibility of a particular project, but rather a cumulative result of regional growth, the responsibility for mitigations is determined based on equitable share calculations as presented in the Caltrans *Guide for the Preparation of Traffic Impact Studies*. Caltrans recommends the following equation to determine a project's equitable share of the cost of improvements:

$$P = \frac{T}{T_B - T_E}$$

where:

P = The equitable share of the project's traffic impact;
T = The project trips generated during the peak hour of the adjacent State Highway facility;
T_B = The forecasted (future with project) traffic volume on the impacted State highway facility;
T_E = The existing traffic on the State Highway facility plus approved projects traffic.

Table 15 presents equitable share responsibility calculations for the Project.

Table 15
Equitable Share Responsibility Calculations – Weekday A.M. Peak Hour

Location	Mitigation	Project Traffic	Existing Traffic	Future Traffic	Equitable Share
SR 41 / Avenue 12	Interchange	24	2,765	14,799	0.20%
SR 41 / Avenue 15	Interchange	26	1,559	7,847	0.41%
SR 41 / SR 145	Interchange	36	1,694	6,423	0.76%
SR 41 / Road 209	Intersection Improvements	40	1,089	2,946	2.15%
SR 41 – Avenue 12 to Avenue 15	6-Lane Freeway	24	1,700	7,469	0.42%
SR 41 – Avenue 15 to SR 145	4-Lane Freeway	26	1,237	4,711	0.75%
SR 41 – SR 145 to Road 209	4-Lane Highway	36	1,376	2,832	2.47%
SR 41 – Road 209 to Road 406	4-Lane Highway	4	1,069	2,442	0.29%

Regional Vehicle-Miles Traveled

The Project is expected to result in a regional reduction in total vehicle-miles traveled. Since there is a limited number of sites that produce aggregate, much of the aggregate used in Madera County is currently hauled from Fresno County or Merced County. The Project will not increase the demand for aggregate or asphalt, which are required anywhere that development is occurring and roads are being constructed, repaired, or improved. However, the proximity of the proposed quarry to the greater Madera area, the Rio Mesa area, and the mountain areas including Coarsegold and Oakhurst will result in shorter trips by trucks hauling aggregate.

The existing aggregate sources in the region (from Central Fresno County to southern Merced County, including Madera County) include the following:

Cemex: Permitted for up to 1,200,000 tons of aggregate per year. Located adjacent to the San Joaquin River with access from Friant Road in Fresno County. Reserves are expected to be exhausted by approximately 2011 based on information provided in the *Update of Mineral Land Classification: Aggregate Materials in the Fresno Production-Consumption Region, California* by Leslie G. Youngs and Russel V. Miller, DMG Open-File Report 99-02, 1999, California Department of Conservation, Division of Mines and Geology (DOC report).

Vulcan: Permitted for up to 1,600,000 tons of aggregate per year. Located adjacent to the San Joaquin River with access from Friant Road in Fresno County. Reserves are expected to be exhausted by approximately 2011 based on information provided in the DOC report.

Vulcan Sanger: Permitted for up to 2,500,000 tons of aggregate per year. Located adjacent to the Kings River with access from State Route 180 northeast of Sanger, Fresno County, California.

CMI: Approved in August 2008; however, not yet in operation. Permitted for up to 1,000,000 tons of aggregate per year. Located adjacent to the Kings River with access from Goodfellow Avenue southeast of Sanger, Fresno County, California.

Jaxon Le Grand: Permitted for up to 500,000 tons of aggregate per year. Located northeast of Le Grand, in southeastern Merced County. This aggregate source is not

considered to be a major supplier in the Fresno/Madera area because of its limited supply primarily expected to be utilized in Merced County.

The aggregate sources listed above are permitted for a total of 6,800,000 tons of aggregate per year. Once the reserves in the two sites on the San Joaquin River are exhausted, the permitted supply will drop to 4,000,000 tons per year. The DOC report projects that the demand for aggregate during the period of 2013 to 2017 will be approximately 8,480,000 tons per year, resulting in a shortfall of approximately 4,480,000 tons per year. The DOC report indicates that an aggregate source in Coalinga, which is outside the Fresno Production-Consumption Area, has historically provided aggregate to the Fresno Production-Consumption Area to make up for shortfalls.

If the Project is permitted, it would provide an additional 900,000 tons of aggregate within the Fresno-Madera Production-Consumption Area, thereby reducing by 900,000 tons the amount of material that would need to be transported from the Coalinga area to adequately service existing and projected demand.

To estimate the potential reduction in vehicle-miles traveled by on-road haul trucks as a result of the Project, the average travel distance to various locations was compared. Table 16 presents a comparison of distances traveled for the Project and the Coalinga site to points in Madera and downtown Fresno, which is assumed to represent an average haul distance.

Table 16
Average Haul Distance

Destination	Distance to Quarry (miles)		One-Way Project Benefit
	Coalinga	Proposed Madera Quarry	
Madera	63	23	40
Fresno	60	26	34

Data available from the State of California, Department of Finance, E-1 Population Estimates for Cities, Counties and the State with Annual Percent Change - January 1, 2007 and 2008, Sacramento, California, May 2008 indicates that approximately 15 percent of the combined population of Fresno and Madera Counties will reside in Madera County and approximately 85 percent will reside in Fresno County. Assuming that aggregate demand is proportional to the population, the weighted average miles saved per trip from the Project is calculated as follows:

Miles saved per delivery (one direction) = 0.15 * 40 + 0.85 * 34 = 35 miles.

Considering round trips, the combined miles saved per delivery is 70 miles. At a capacity of 25 tons per haul truck, the number of deliveries per year is calculated as 900,000 / 25 = 36,000. Therefore, the average reduction in haul truck miles traveled per year as a result of the Project is expected to be on the order of 36,000 * 70 = 2,520,000 miles.

Conclusions

Standard traffic engineering principles and methods, as described herein, were employed to estimate the amount of traffic expected to be generated by the Project and to analyze the traffic conditions expected to exist in the future. The conclusion of this traffic impact study is that the Project will create one opening-day impact. This impact is the exacerbation of an

existing substandard LOS at the intersection of SR 41 and Avenue 15. Delays are experienced by traffic on Avenue 15 that is delayed while awaiting gaps in traffic on SR 41. There are no feasible mitigations, primarily because traffic signal warrants are not satisfied. Therefore, the opening-day impact is significant and unavoidable. Eventually, as traffic volumes in the region increase as a result of further development, warrants for traffic signals are expected to be satisfied and traffic signals will be required to be installed by future development projects. Therefore, the impact is not expected to be permanent.

The Project will also contribute to cumulative significant impacts requiring mitigation by the year 2030. Mitigations will consist of the payment of transportation impacts fees. The Project can also mitigate its impact by constructing a portion of the required cumulative mitigations. The cost of the construction shall be credited against the Project's equitable share. If any of these mitigations are not fully funded by the fee program then the impact at that location would remain significant and unavoidable.

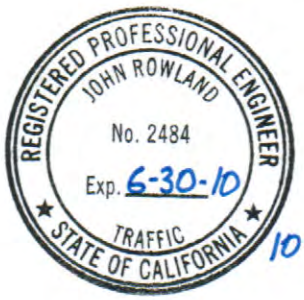
The LOS at the intersection of SR 41 and Road 209 may drop below C based on the cumulative year 2030 conditions, particularly if commercial development occurs near the intersection. Since Caltrans has indicated that traffic signals are not desirable at the intersection of SR 41 and Road 209 due to the close spacing between Road 209 and SR 145, traffic signals are not recommended as a feasible mitigation. Further, since the need for traffic signals at the intersection is caused almost entirely by hypothetical commercial development near the intersection, the Project's share of the cumulative impact is minimal and will become significant and unavoidable if the LOS at the intersection ever drops below LOS C. The Project can mitigate its share of the cumulative significant impacts by paying an equitable share of the cost of improvements required by Caltrans.

The study also concludes that the Project is likely to result in a substantial reduction in regional vehicle-miles traveled by aggregate haul trucks.

Thank you for the opportunity to perform this traffic impact study. Please feel free to call our office if you have any questions.

PETERS ENGINEERING GROUP

John Rowland, PE, TE



10-13-09

Attachments:
Attachment 1: List of References
Attachment 2: Figures
Attachment 3: Traffic Count Data Sheets
Attachment 4: 2000 and 2030 Madera County Travel Model
Attachment 5: Intersection Analyses
Attachment 6: Peak Hour Traffic Signal Warrants

ATTACHMENT 1
LIST OF REFERENCES

LIST OF REFERENCES

County of Madera. *Madera County General Plan Policy Document*, October 24, 1995.

Madera County Transportation Commission, 2001 Howard Road, Suite 201, Madera, California 93637.

Resource Design Technology, Inc. *Madera Ranch Quarry Draft Environmental Impact Report*, June 2005.

State of California Department of Transportation. *California Manual on Uniform Traffic Control Devices for Streets and Highways*, September 26, 2006.

State of California, Department of Finance, *E-1 Population Estimates for Cities, Counties and the State with Annual Percent Change - January 1, 2007 and 2008*, Sacramento, California, May 2008.

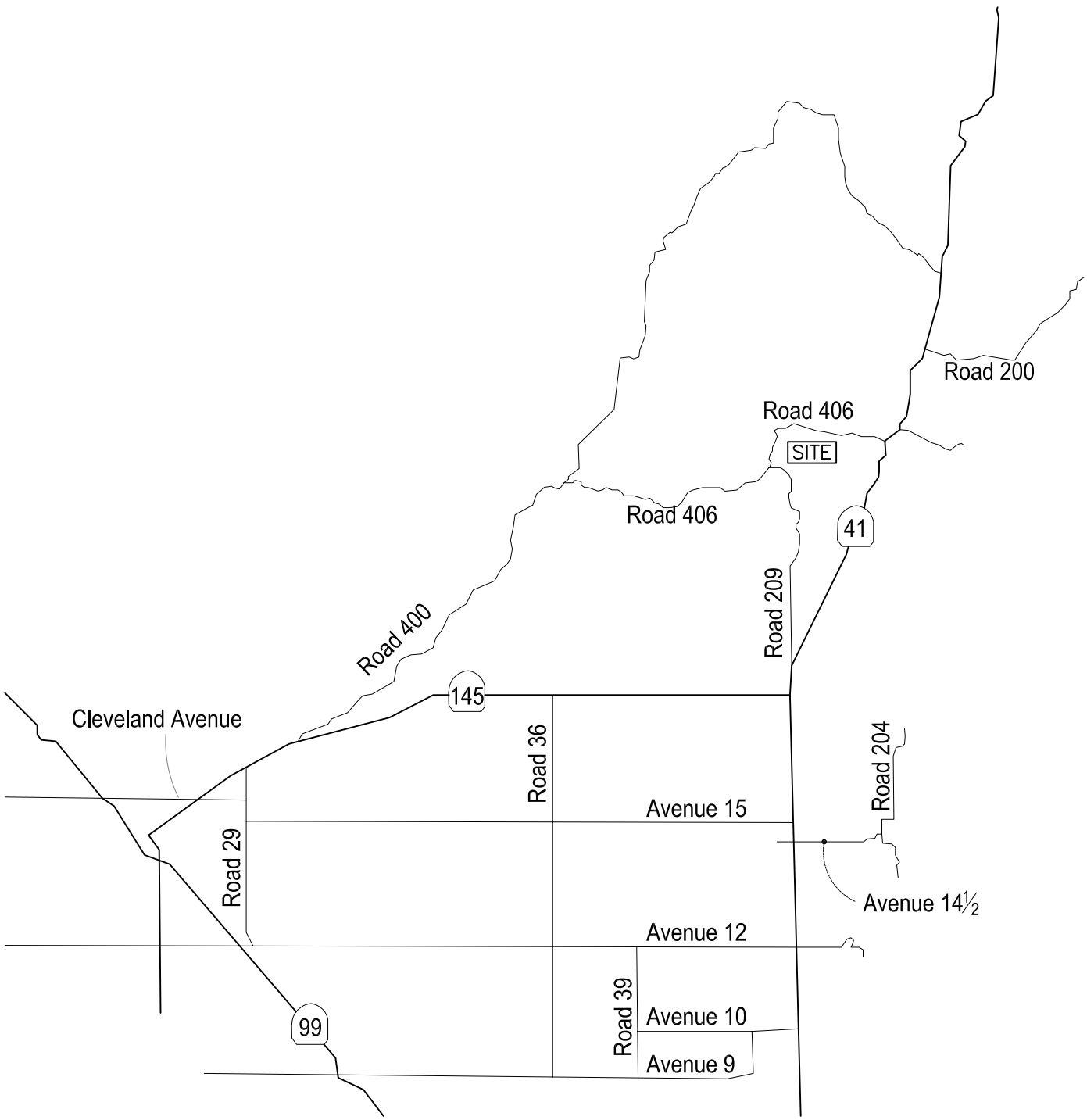
State of California Department of Transportation. *Guide for the Preparation of Traffic Impact Studies*, December 2002.

Transportation Research Board. *Highway Capacity Manual*, 2000.

Transportation Research Board, National Cooperative Highway Research Program. *Report 255: Highway Traffic Data for Urbanized Area Project Planning and Design*. December 1982.

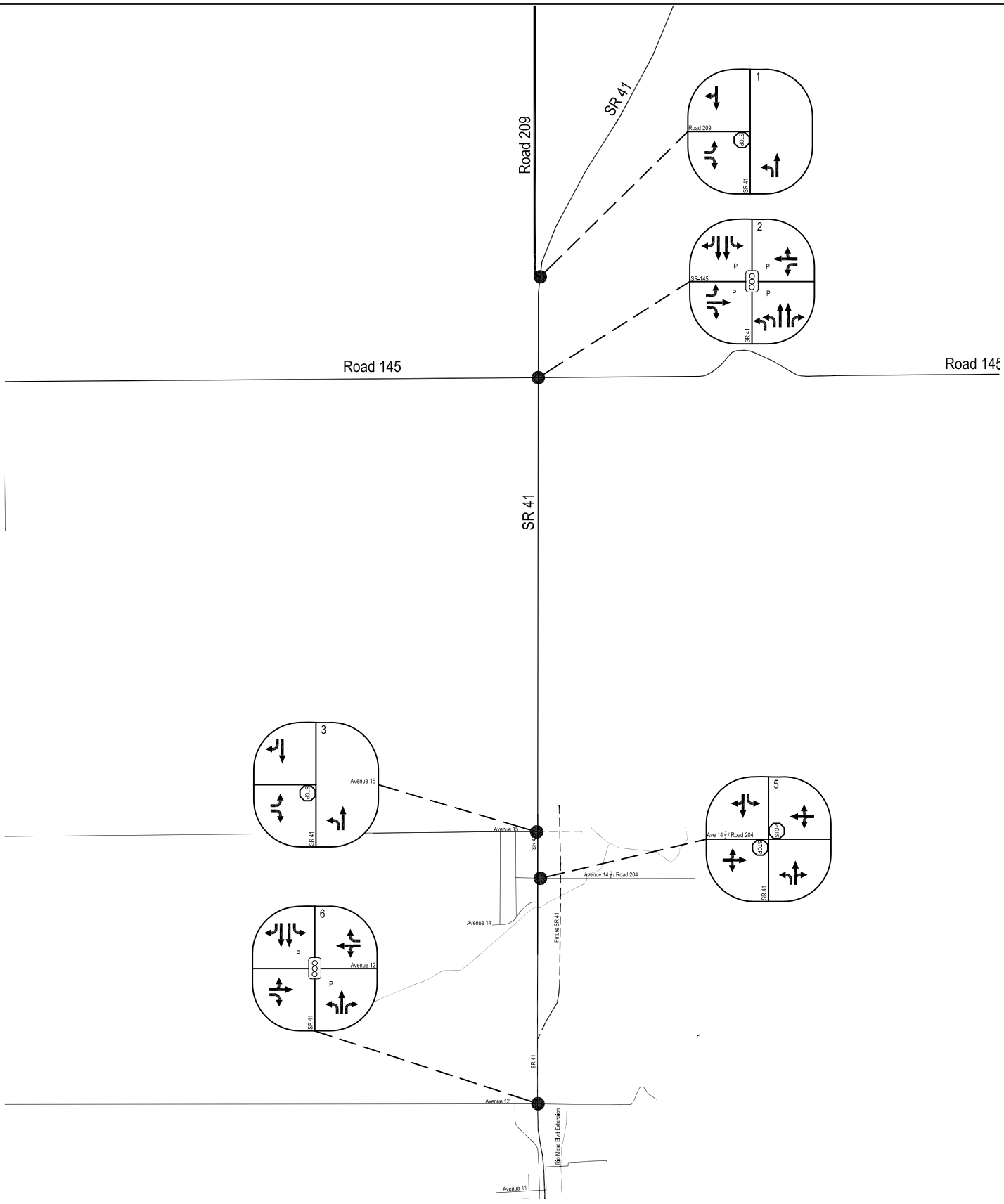
Youngs, Leslie G. and Russel V. Miller. California Department of Conservation, Division of Mines and Geology, *Update of Mineral Land Classification: Aggregate Materials in the Fresno Production-Consumption Region, California*, DMG Open-File Report 99-02, 1999.

ATTACHMENT 2
FIGURES



VICINITY MAP
Proposed Madera Ranch Quarry
Madera County, California

Not to Scale

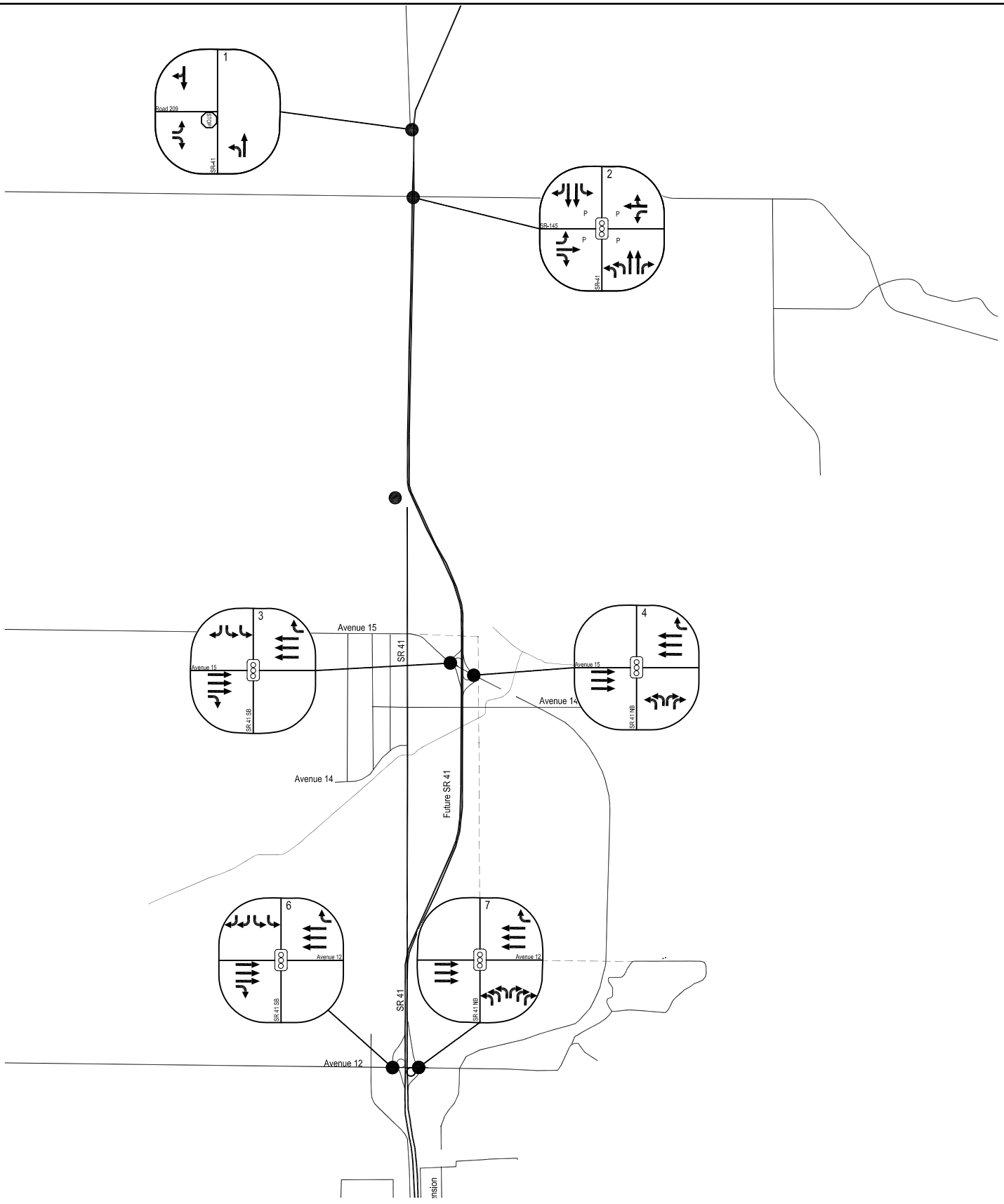


LEGEND

- SIGNALIZED INTERSECTION
- STOP SIGN
- DIRECTION OF TRAVEL
- P PROTECTED LEFT-TURN PHASE

EXISTING LANE CONFIGURATIONS
Proposed Madera Ranch Quarry
Madera County, California

Not to Scale

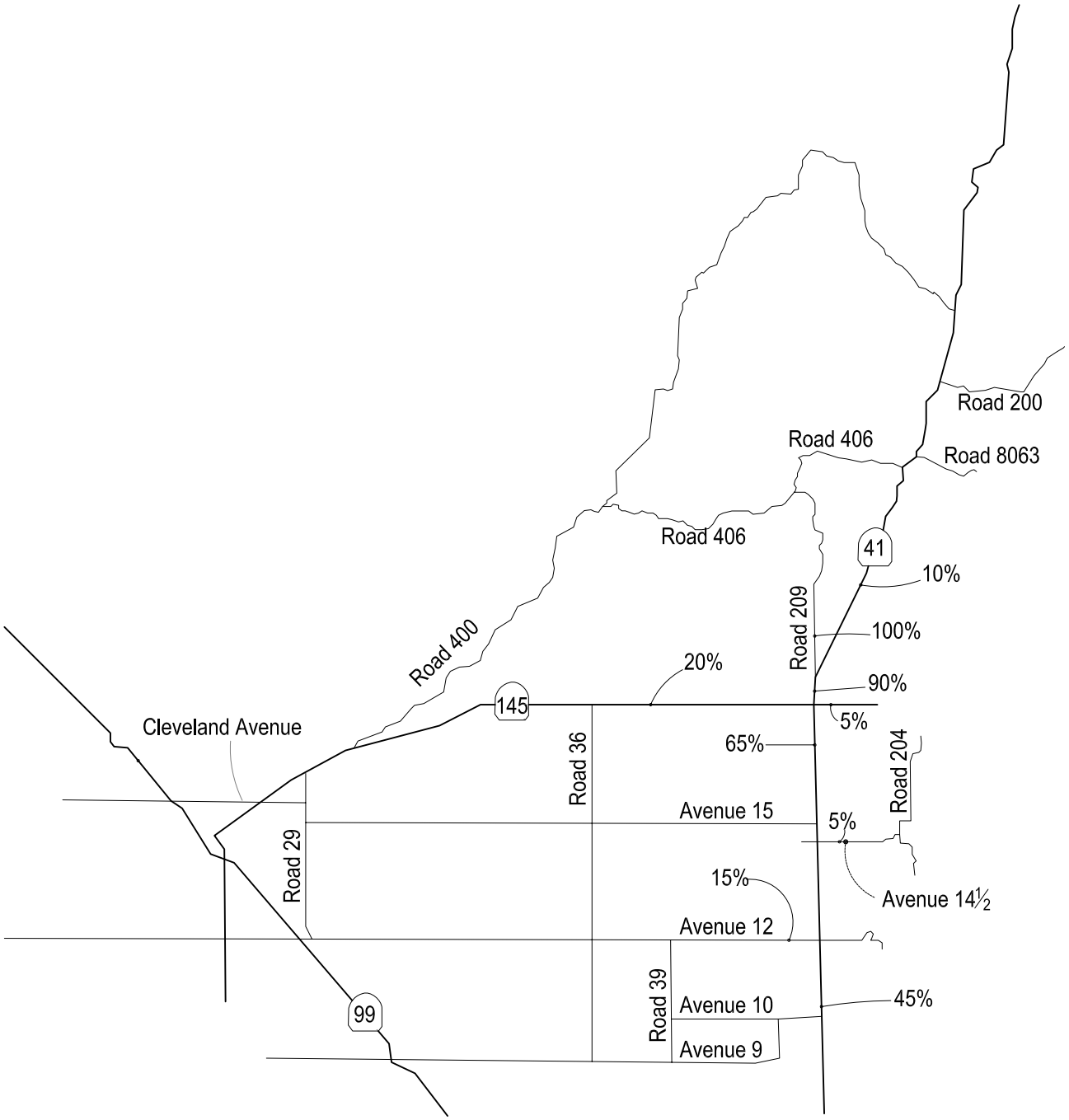


LEGEND

- SIGNALIZED INTERSECTION
- STOP SIGN
- DIRECTION OF TRAVEL
- P PROTECTED LEFT-TURN PHASE

CUMULATIVE LANE CONFIGURATIONS
Proposed Madera Ranch Quarry
Madera County, California

Not to Scale

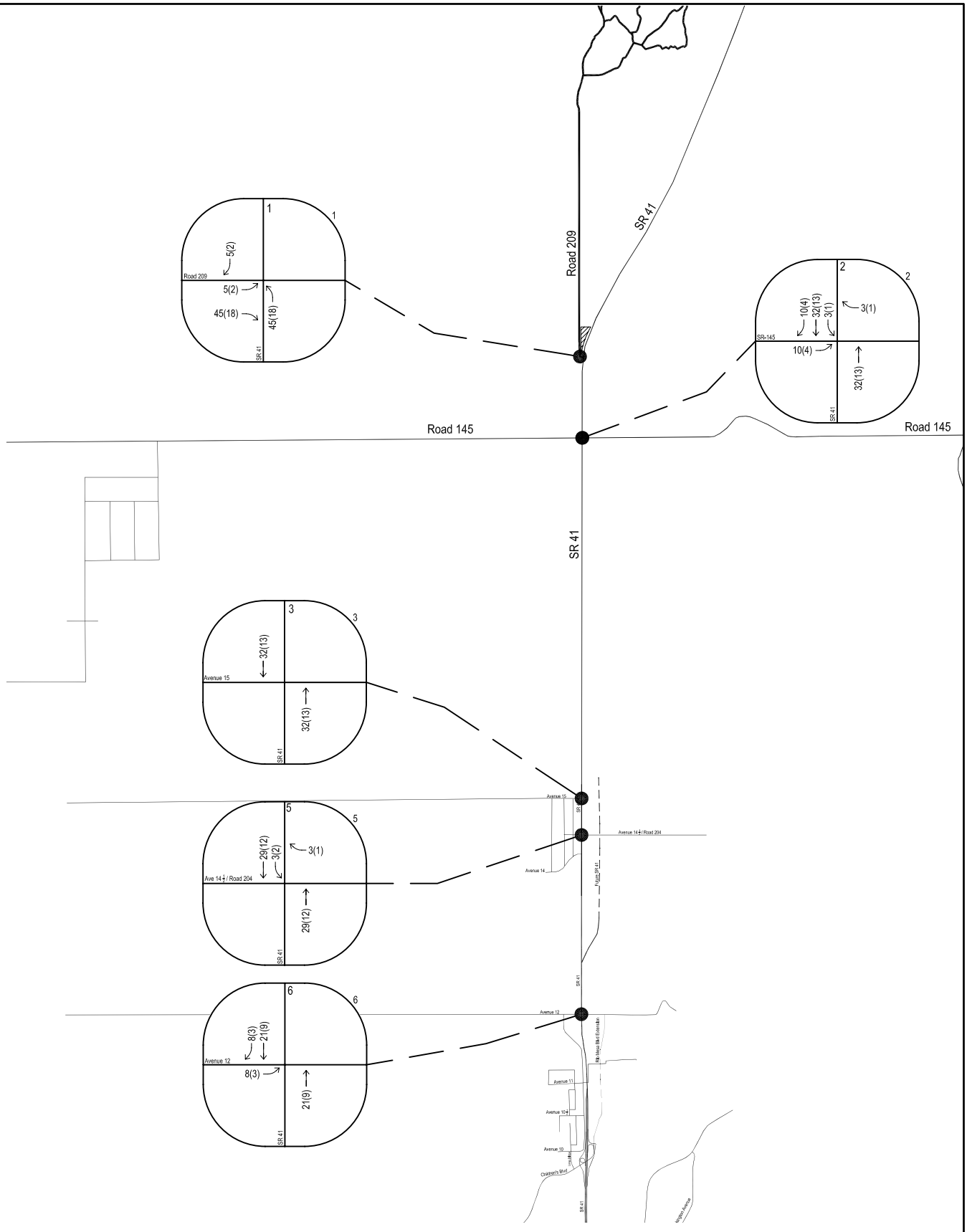


PROJECT TRAFFIC DISTRIBUTION PERCENTAGE

Proposed Madera Ranch Quarry

Madera County, California

Not to Scale

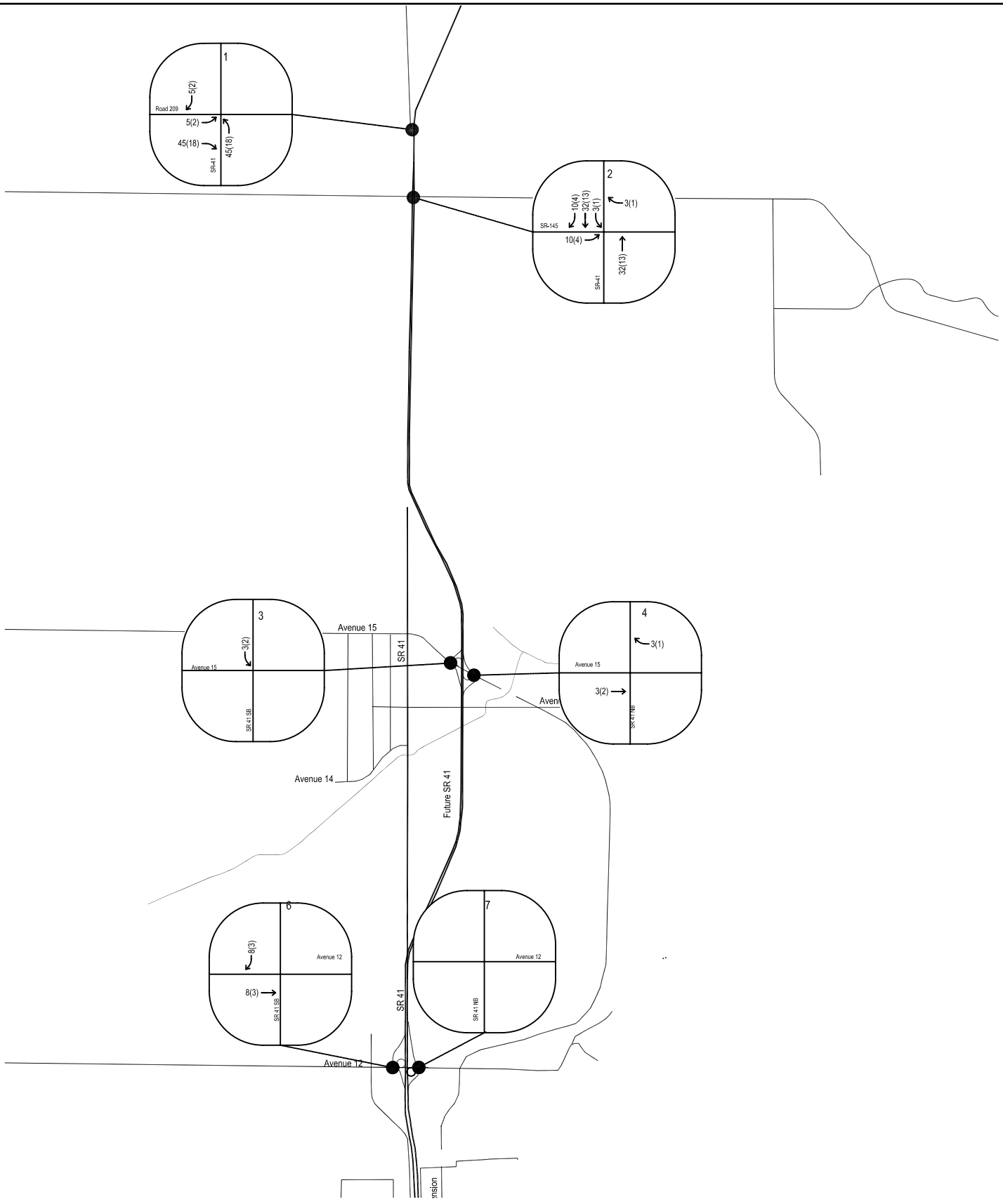


OPENING DAY PROJECT TRAFFIC VOLUMES
Proposed Madera Ranch Quarry
Madera County, California

LEGEND

XX-AM Peak Hour Volumes
(XX)-PM Peak Hour Volumes

Not to Scale

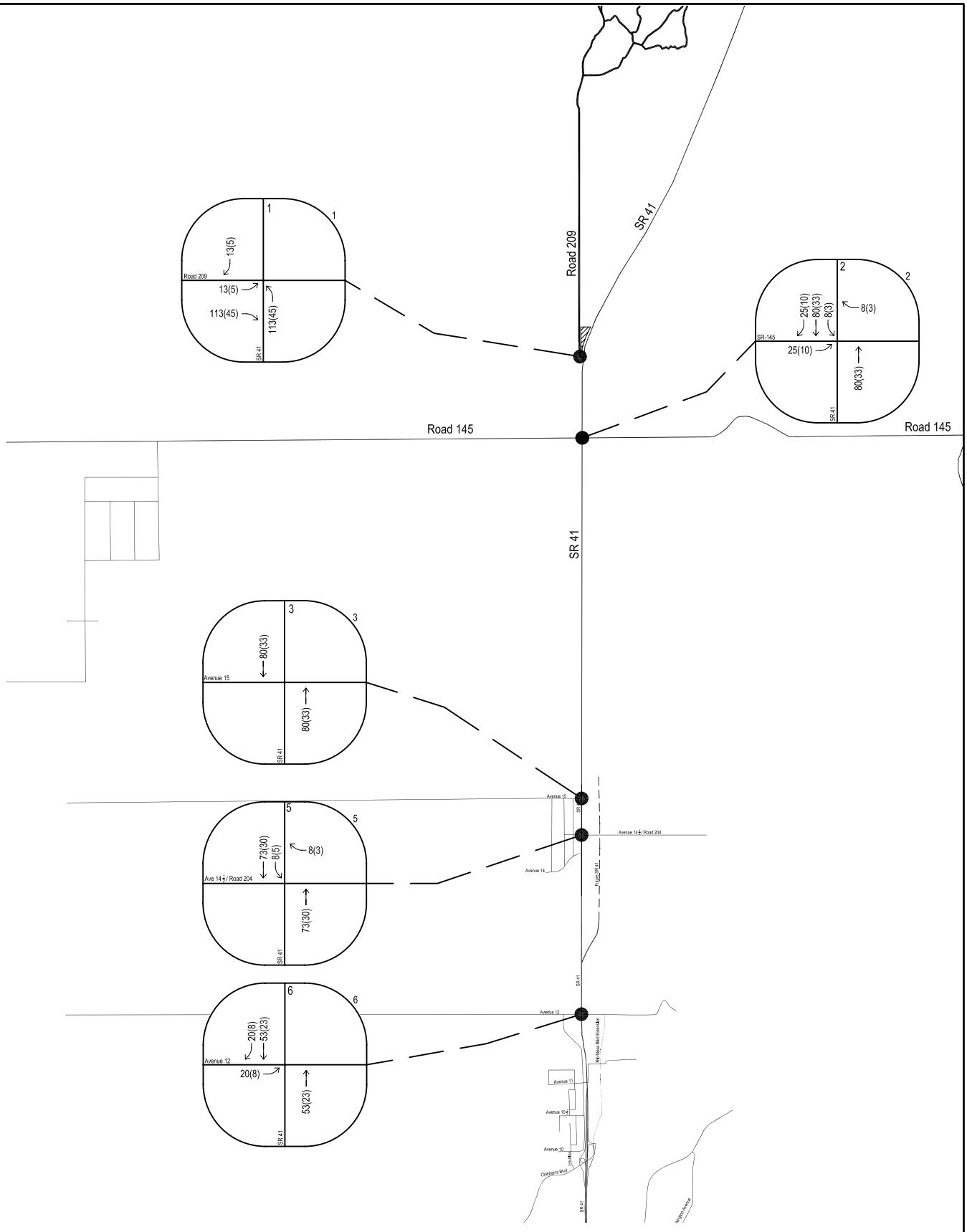


ULTIMATE PROJECT TRAFFIC VOLUMES
Proposed Madera Ranch Quarry
Madera County, California

LEGEND

XX-AM Peak Hour Volumes
(XX)-PM Peak Hour Volumes

Not to Scale

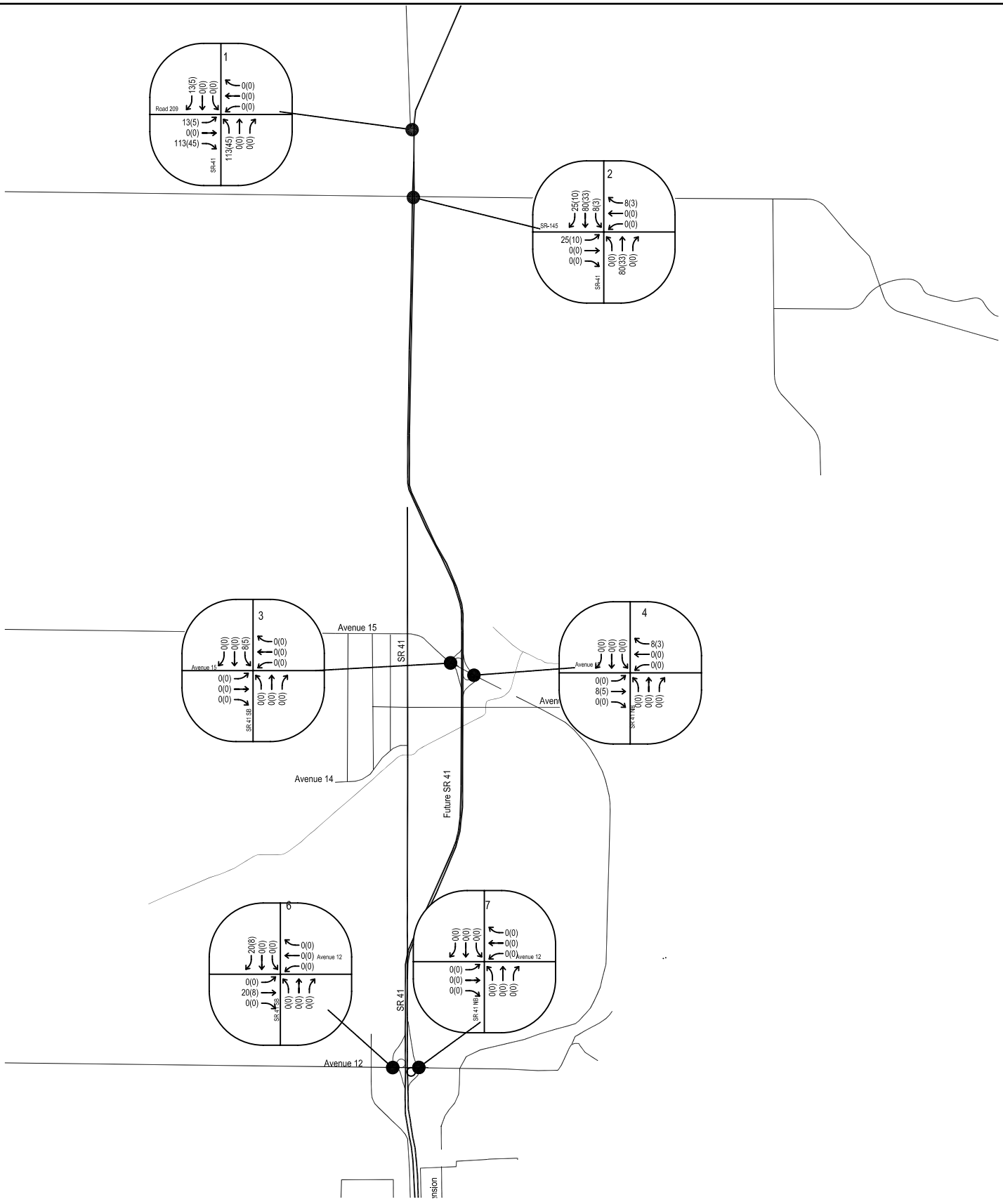


PCE PROJECT TRAFFIC VOLUMES
Proposed Madera Ranch Quarry
Madera County, California

LEGEND

XX-AM Peak Hour Volumes
(XX)-PM Peak Hour Volumes

Not to Scale

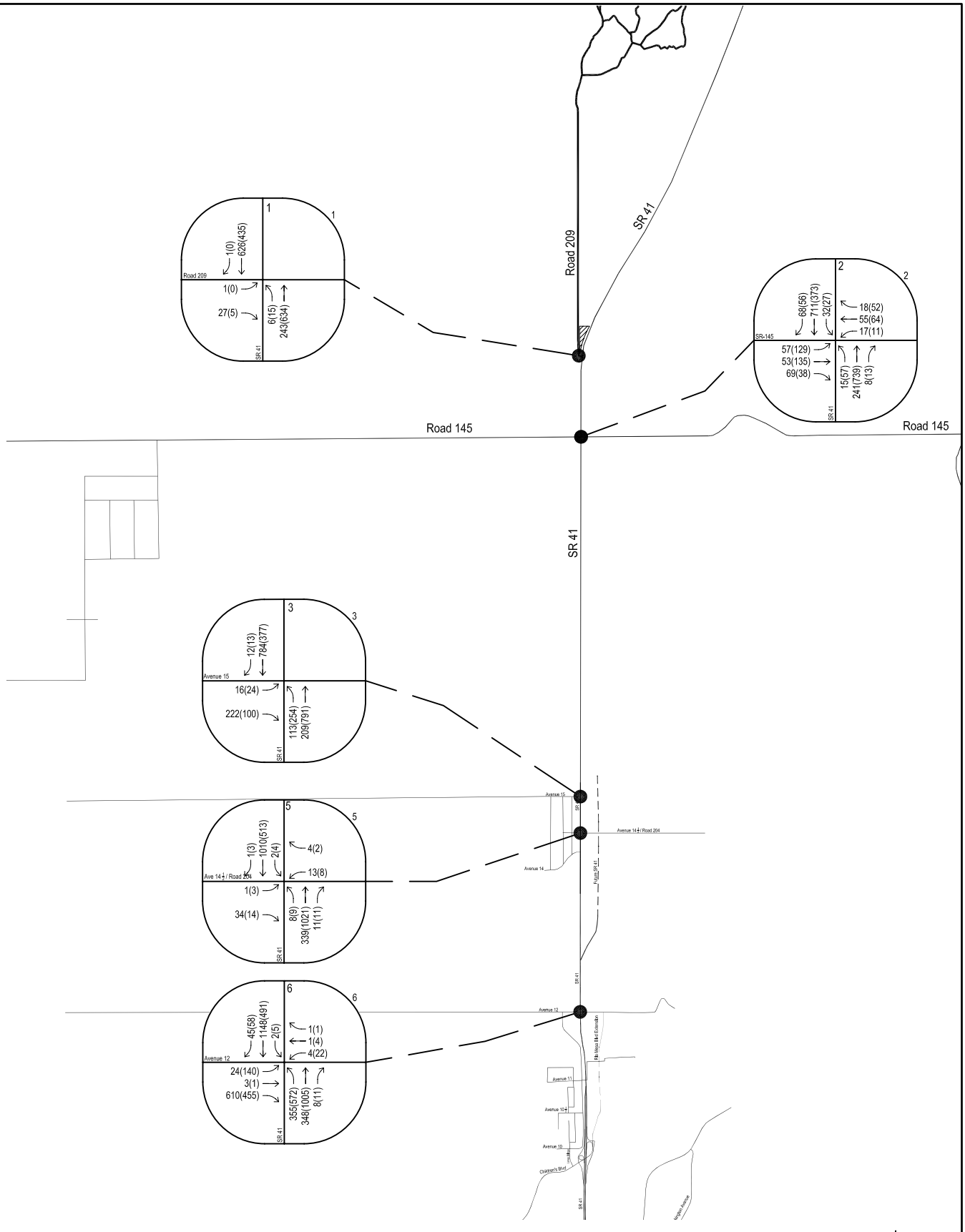


2030 PCE PROJECT TRAFFIC VOLUMES
Proposed Madera Ranch Quarry
Madera County, California

LEGEND

XX-AM Peak Hour Volumes
(XX)-PM Peak Hour Volumes

Not to Scale

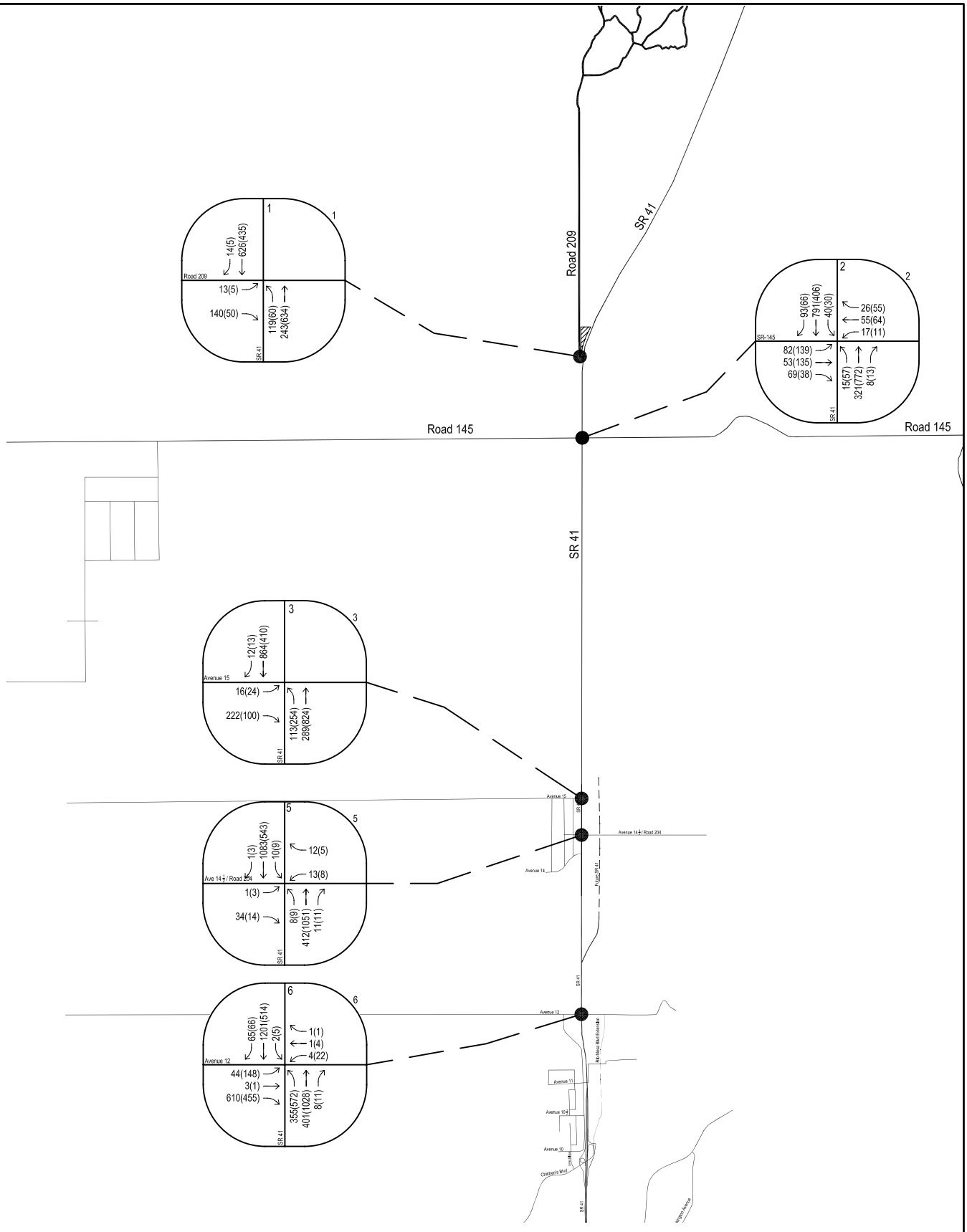


EXISTING TRAFFIC VOLUMES
Proposed Madera Ranch Quarry
Madera County, California

LEGEND

XX-AM Peak Hour Volumes
(XX)-PM Peak Hour Volumes

Not to Scale

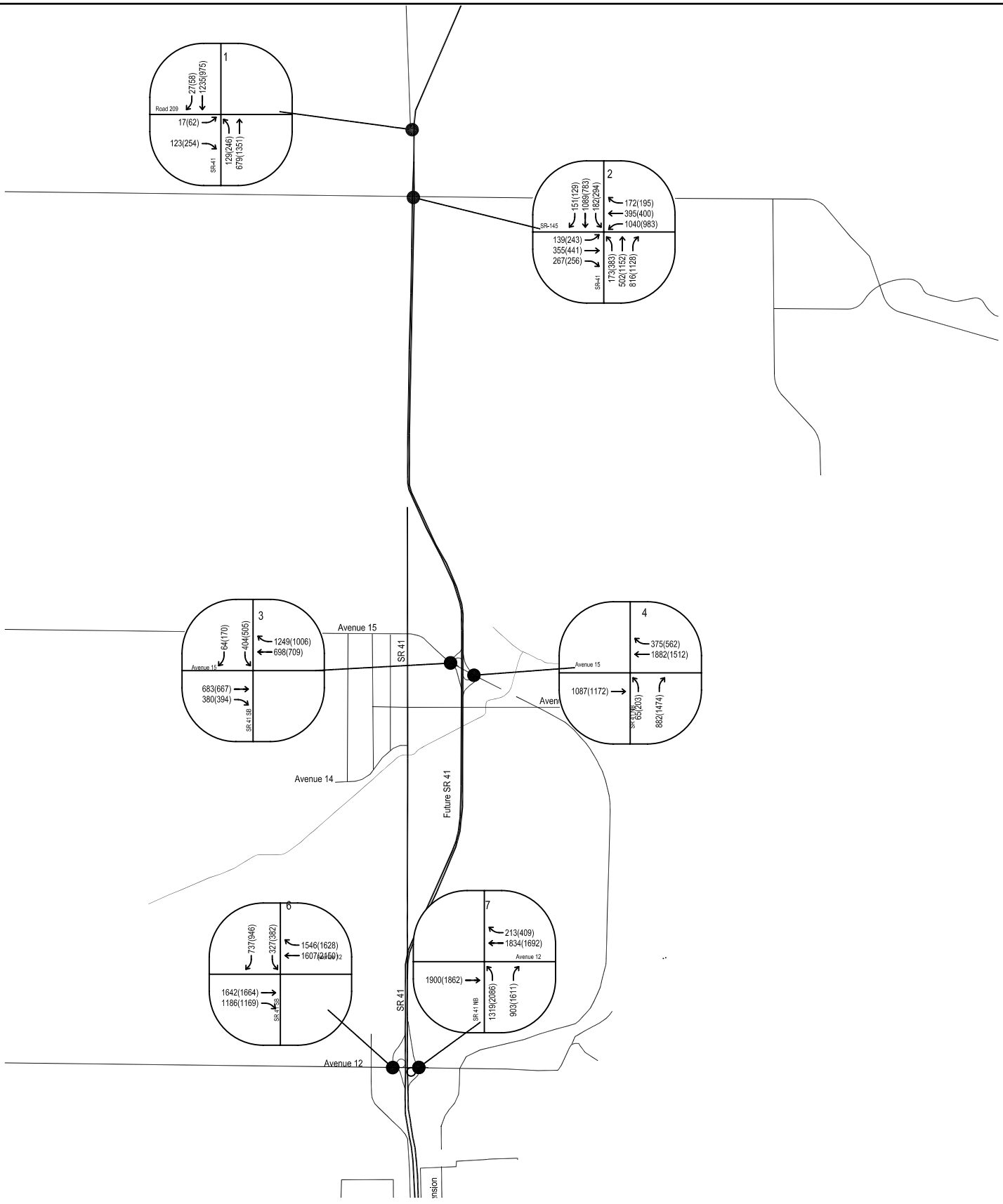


EXISTING PLUS PROJECT TRAFFIC VOLUMES
Proposed Madera Ranch Quarry
Madera County, California

LEGEND

XX-AM Peak Hour Volumes
(XX)-PM Peak Hour Volumes

Not to Scale

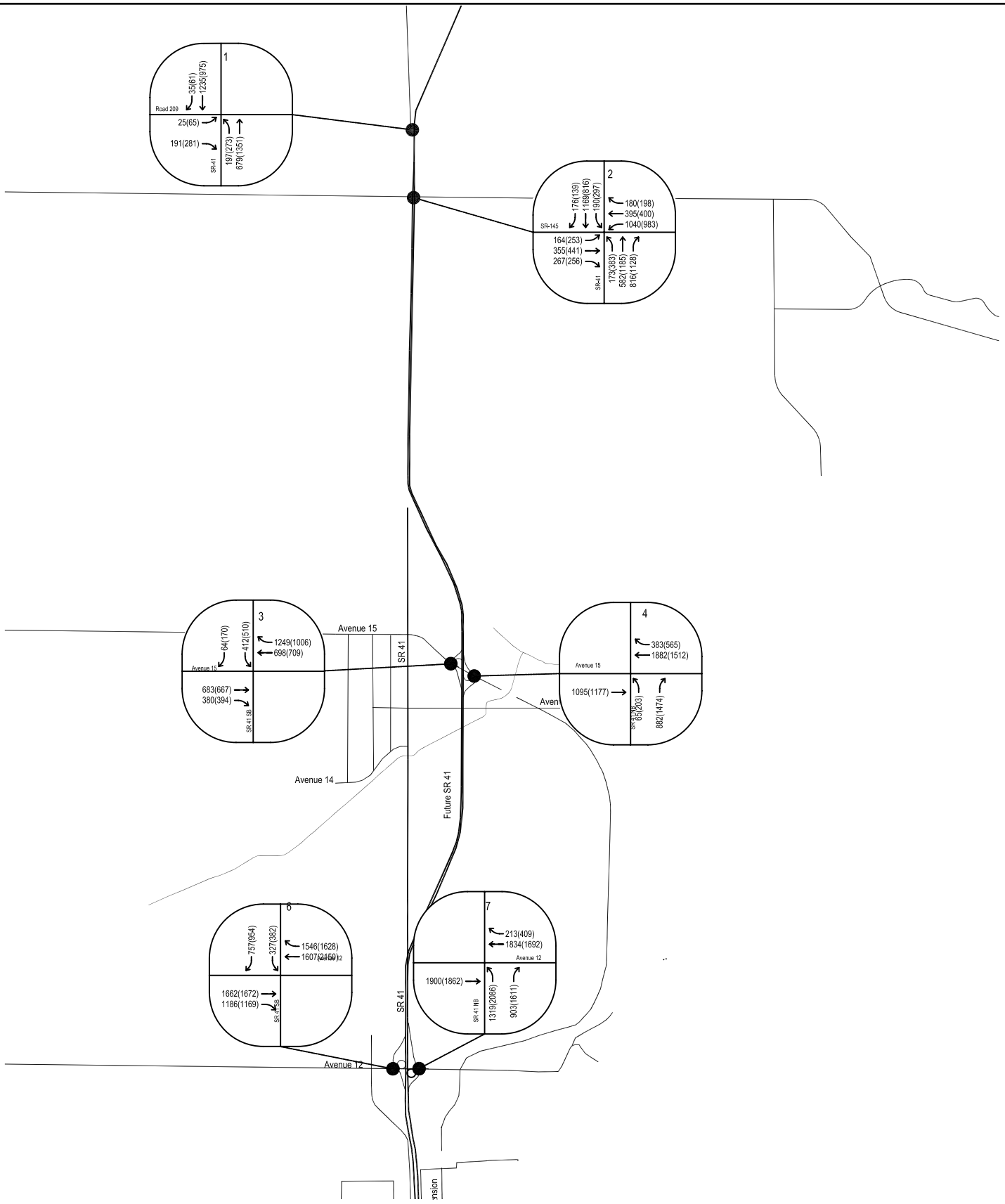


CUMULATIVE 2030 NO PROJECT TRAFFIC VOLUMES
Proposed Madera Ranch Quarry
Madera County, California

LEGEND

XX-AM Peak Hour Volumes
(XX)-PM Peak Hour Volumes

Not to Scale



CUMULATIVE 2030 WITH PROJECT TRAFFIC VOLUMES
Proposed Madera Ranch Quarry
Madera County, California

LEGEND

XX-AM Peak Hour Volumes
(XX)-PM Peak Hour Volumes

Not to Scale

ATTACHMENT 3
TRAFFIC COUNT DATA SHEETS

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

N-S STREET: SR-41 DATE: 03/12/2008 LOCATION: City of Madera

E-W STREET: Ave 12 DAY: WEDNESDAY PROJECT# 08-8070-002

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	1	1	1	2	1	0.5	0.5	1	0.5	0.5	1	
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	89	68	0	0	178	13	8	0	109	0	0	0	465
7:15 AM	91	103	1	0	251	17	7	1	145	0	0	0	616
7:30 AM	93	89	3	2	349	11	4	0	164	3	1	1	720
7:45 AM	95	93	2	0	356	5	7	2	151	1	0	0	712
8:00 AM	76	63	2	0	192	12	6	0	150	0	0	0	501
8:15 AM	83	113	6	1	195	15	6	0	129	1	1	1	551
8:30 AM	81	69	0	0	196	14	8	1	117	0	0	0	486
8:45 AM	82	48	2	0	159	9	2	1	114	1	0	0	418
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
VOLUMES =	690	646	16	3	1876	96	48	5	1079	6	2	2	4469

AM Peak Hr Begins at: 715 AM

PEAK VOLUMES =	355	348	8	2	1148	45	24	3	610	4	1	1	2549
PEAK HR. FACTOR:		0.912			0.825			0.948			0.300		0.885

CONTROL: Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

N-S STREET: SR-41 DATE: 03/12/2008 LOCATION: City of Madera

E-W STREET: Ave 12 DAY: WEDNESDAY PROJECT# 08-8070-002

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	1	1	1	2	1	0.5	0.5	1	0.5	0.5	1	
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	127	213	1	0	148	16	27	1	101	8	0	0	642
4:15 PM	124	229	1	1	138	12	25	0	112	10	1	0	653
4:30 PM	142	229	1	0	109	9	33	1	135	6	0	0	665
4:45 PM	156	245	3	0	141	15	35	0	106	2	1	0	704
5:00 PM	130	257	4	5	121	12	37	1	127	7	1	0	702
5:15 PM	145	251	2	0	110	13	35	0	113	4	1	1	675
5:30 PM	141	252	2	0	119	18	33	0	109	9	1	0	684
5:45 PM	140	214	0	0	129	25	34	1	103	5	0	0	651
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													
TOTAL VOLUMES =	NL 1105	NT 1890	NR 14	SL 6	ST 1015	SR 120	EL 259	ET 4	ER 906	WL 51	WT 5	WR 1	TOTAL 5376

PM Peak Hr Begins at: 445 PM

PEAK VOLUMES =	572	1005	11	5	491	58	140	1	455	22	4	1	2765
PEAK HR. FACTOR:		0.983			0.888			0.903			0.675		0.982

CONTROL: Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

N-S STREET: SR-41 DATE: 03/12/2008 LOCATION: City of Madera

E-W STREET: Ave 14-1/2 / Rd 204 DAY: WEDNESDAY PROJECT# 08-8070-004

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	1	0	1	1	0	0	1	0	0	1	0	
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	1	79	4	1	191	0	0		7	2		1	286
7:15 AM	0	84	2	0	285	0	1		11	3		0	386
7:30 AM	4	98	1	0	280	0	0		9	3		2	397
7:45 AM	3	78	4	1	254	1	0		7	5		1	354
8:00 AM	0	62	2	0	192	0	0		1	5		1	263
8:15 AM	2	101	4	0	203	1	0		2	4		1	318
8:30 AM	3	83	2	0	210	1	1		2	4		0	306
8:45 AM	1	61	1	0	138	0	0		2	1		0	204
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
VOLUMES =	14	646	20	2	1753	3	2	0	41	27	0	6	2514

AM Peak Hr Begins at: 700 AM

PEAK													
VOLUMES =	8	339	11	2	1010	1	1	0	34	13	0	4	1423
PEAK HR. FACTOR:		0.869			0.889			0.729			0.708		0.896

CONTROL: 2-Way Stop Sign (E/W)

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

N-S STREET: SR-41 DATE: 03/12/2008 LOCATION: City of Madera

E-W STREET: Ave 14-1/2 / Rd 204 DAY: WEDNESDAY PROJECT# 08-8070-004

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	1	0	1	1	0	0	1	0	0	1	0	
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	3	180	2	0	137	0	0		1	9		11	343
4:15 PM	7	257	3	1	147	1	0		7	2		2	427
4:30 PM	1	205	4	2	146	0	0		3	4		1	366
4:45 PM	1	255	1	1	136	0	0		4	4		0	402
5:00 PM	3	264	5	0	110	1	2		2	2		0	389
5:15 PM	3	272	2	1	139	1	1		2	1		2	424
5:30 PM	2	230	3	2	128	1	0		6	1		0	373
5:45 PM	7	271	2	0	110	1	1		2	3		0	397
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
VOLUMES =	27	1934	22	7	1053	5	4	0	27	26	0	16	3121

PM Peak Hr Begins at: 445 PM

PEAK													
VOLUMES =	9	1021	11	4	513	3	3	0	14	8	0	2	1588
PEAK HR. FACTOR:		0.940			0.922			0.708			0.625		0.936

CONTROL: 2-Way Stop Sign (E/W)

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

N-S STREET: SR-41 DATE: 03/12/2008 LOCATION: City of Madera

E-W STREET: Ave 15 DAY: WEDNESDAY PROJECT# 08-8070-003

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	1	0	0	1	1	0	1	1	0	0	0	
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	26	49			149	6	2		43				275
7:15 AM	26	60			208	2	3		57				356
7:30 AM	36	62			229	4	4		54				389
7:45 AM	30	43			188	2	3		62				328
8:00 AM	21	44			159	4	6		49				283
8:15 AM	20	85			158	4	9		41				317
8:30 AM	23	63			193	1	5		36				321
8:45 AM	19	63			139	5	2		25				253
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
VOLUMES =	201	469	0	0	1423	28	34	0	367	0	0	0	2522

AM Peak Hr Begins at: 715 AM

PEAK													
VOLUMES =	113	209	0	0	784	12	16	0	222	0	0	0	1356
PEAK HR. FACTOR:		0.821			0.854			0.915			0.000		0.871

CONTROL: 1-Way Stop Sign (EB)

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

N-S STREET: SR-41 DATE: 03/12/2008 LOCATION: City of Madera

E-W STREET: Ave 15 DAY: WEDNESDAY PROJECT# 08-8070-003

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	1	0	0	1	1	0	1	1	0	0	0	
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	49	154			115	6	5		20				349
4:15 PM	69	193			112	8	7		24				413
4:30 PM	50	161			98	7	6		38				360
4:45 PM	53	190			94	3	4		31				375
5:00 PM	73	197			89	4	3		23				389
5:15 PM	66	207			96	3	5		35				412
5:30 PM	57	178			111	2	5		22				375
5:45 PM	58	209			81	4	11		20				383
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
VOLUMES =	475	1489	0	0	796	37	46	0	213	0	0	0	3056

PM Peak Hr Begins at: 500 PM

PEAK													
VOLUMES =	254	791	0	0	377	13	24	0	100	0	0	0	1559
PEAK HR. FACTOR:		0.957			0.863			0.775			0.000		0.946

CONTROL: 1-Way Stop Sign (EB)

Intersection Turning Movement

Prepared by: Southland Car Counters

N-S STREET: SR-41 DATE: 3/1/2006 LOCATION: City of Coarsegold

E-W STREET: Road 145 DAY: WEDNESDAY PROJECT# 06-8027-009

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	1	1	1	1	1	0	1	0	0	1	0	
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	3	56	3	12	199	19	23	18	21	9	22	4	389
7:15 AM	2	65	0	4	207	20	9	17	26	3	19	8	380
7:30 AM	8	66	2	11	153	19	8	9	10	4	10	5	305
7:45 AM	2	54	3	5	152	10	17	9	12	1	4	1	270
8:00 AM	7	79	4	6	144	17	13	14	15	6	7	3	315
8:15 AM	6	60	3	6	147	31	15	13	11	2	11	5	310
8:30 AM	6	68	4	3	105	17	14	7	8	2	6	4	244
8:45 AM	1	69	6	3	131	18	15	13	5	3	3	4	271
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													
TOTAL VOLUMES =	35	517	25	50	1238	151	114	100	108	30	82	34	2484

AM Peak Hr Begins at: 700 AM

PEAK VOLUMES =	15	241	8	32	711	68	57	53	69	17	55	18	1344
PEAK HR. FACTOR:		0.868			0.878			0.722			0.643		0.864

CONTROL: Signalized

2025 28 451 15 60 1330 127 107 99 129 32 103 34

	Southern Leg		Northern Leg		Western Leg		Eastern Leg	
Leg	SB	NB	NB	SB	WB	EB	EB	WB
AM	657	294	326	701	132	146	93	59
PM	175	379	432	187	67	137	73	56

Intersection Turning Movement

Prepared by: Southland Car Counters

N-S STREET: SR-41 DATE: 3/1/2006 LOCATION: City of Coarsegold

E-W STREET: Road 145 DAY: WEDNESDAY PROJECT# 06-8027-009

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	1	1	1	1	1	0	1	0	0	1	0	
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	9	142	2	0	69	14	24	38	6	8	18	10	340
4:15 PM	14	178	5	11	85	12	22	26	9	10	24	16	412
4:30 PM	14	170	3	7	84	7	33	28	9	5	15	12	387
4:45 PM	12	209	4	2	119	17	31	39	10	4	13	14	474
5:00 PM	16	178	3	9	84	12	34	34	7	0	17	15	409
5:15 PM	15	182	3	9	86	20	31	34	12	2	19	11	424
5:30 PM	11	173	4	2	76	9	30	34	4	4	11	14	372
5:45 PM	13	176	2	6	83	11	29	37	3	5	12	10	387
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													
TOTAL VOLUMES =	NL 104	NT 1408	NR 26	SL 46	ST 686	SR 102	EL 234	ET 270	ER 60	WL 38	WT 129	WR 102	TOTAL 3205

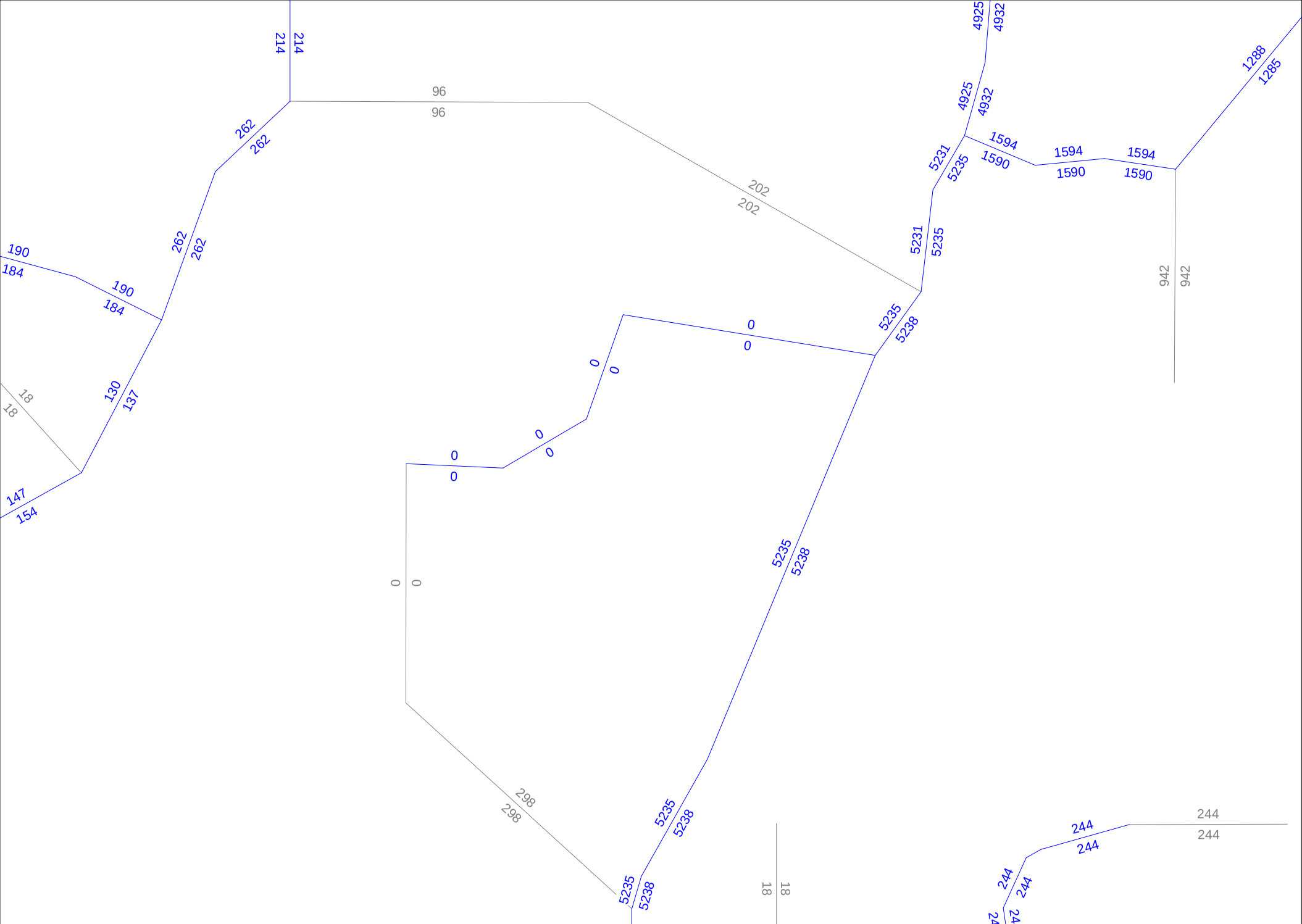
PM Peak Hr Begins at: 430 PM

PEAK VOLUMES =	57	739	13	27	373	56	129	135	38	11	64	52	1694
PEAK HR. FACTOR:		0.899			0.826			0.944			0.992		0.893

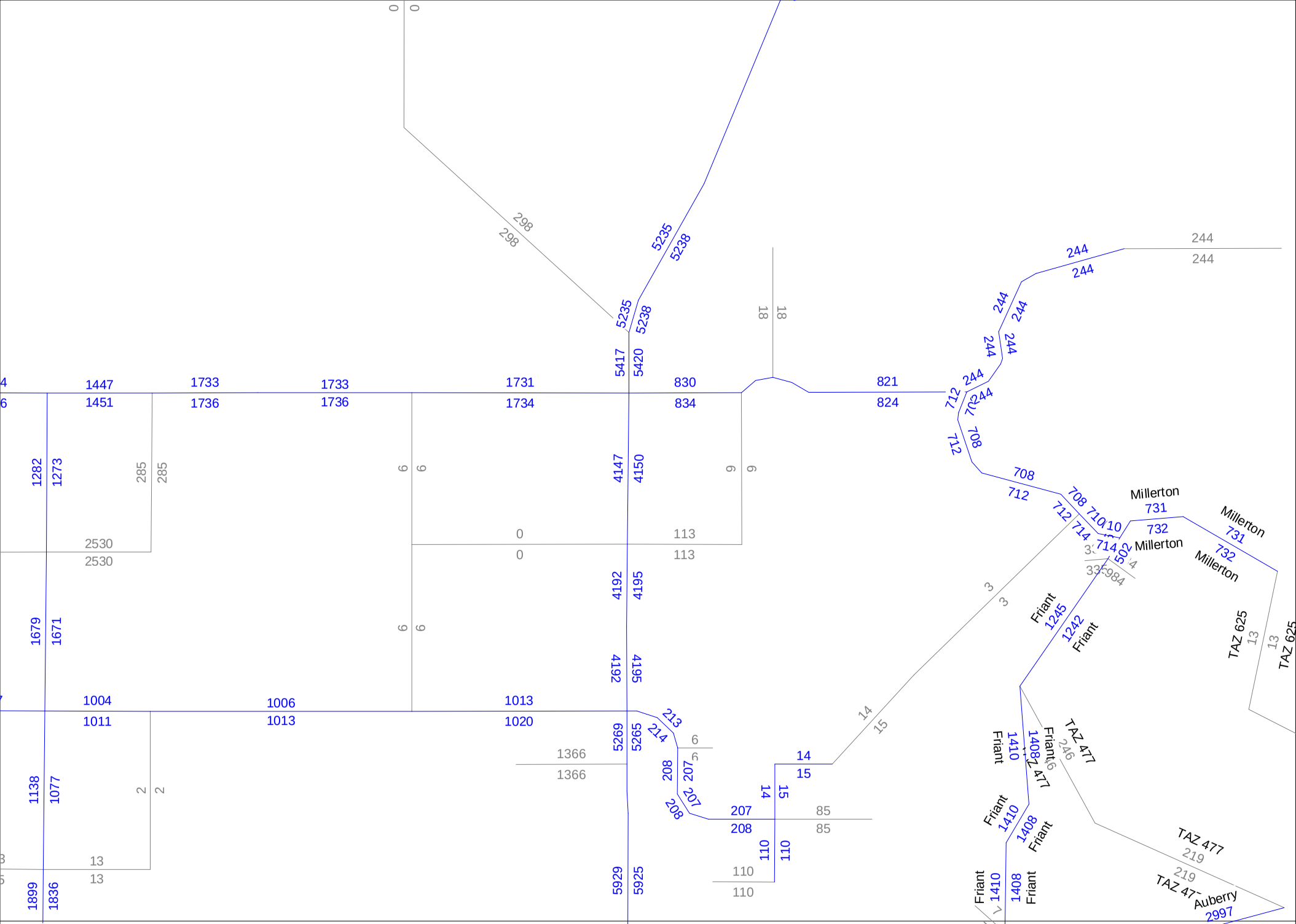
CONTROL: Signalized

2025	107	1382	24	50	698	105	241	252	71	21	120	97	
	Southern Leg			Northern Leg			Western Leg			Eastern Leg			
Leg	SB		NB	NB		SB	WB		EB	EB		WB	
AM	0		0	0		0	0		0	0		0	

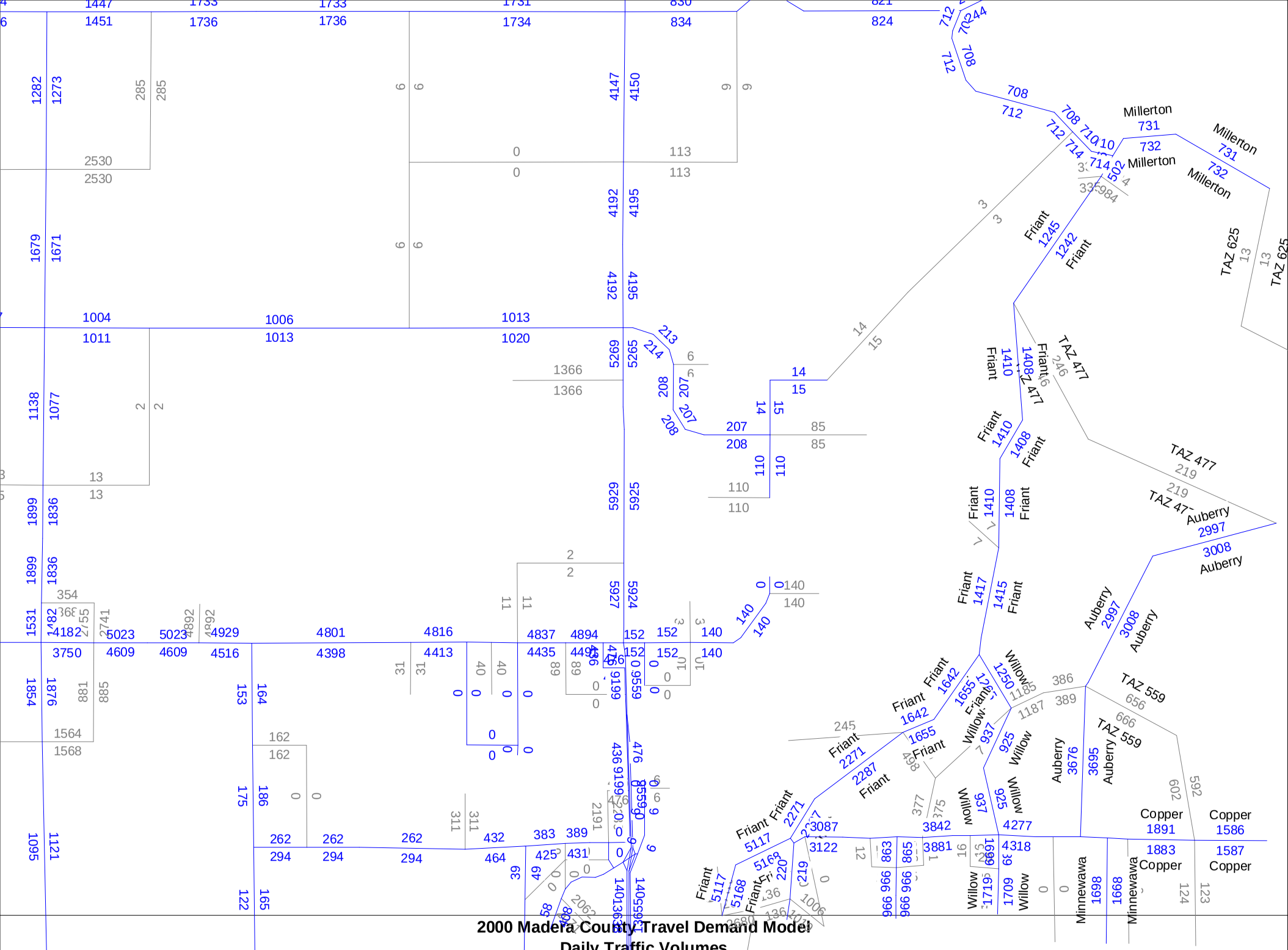
ATTACHMENT 4
2000 & 2030 MADERA COUNTY TRAVEL MODEL



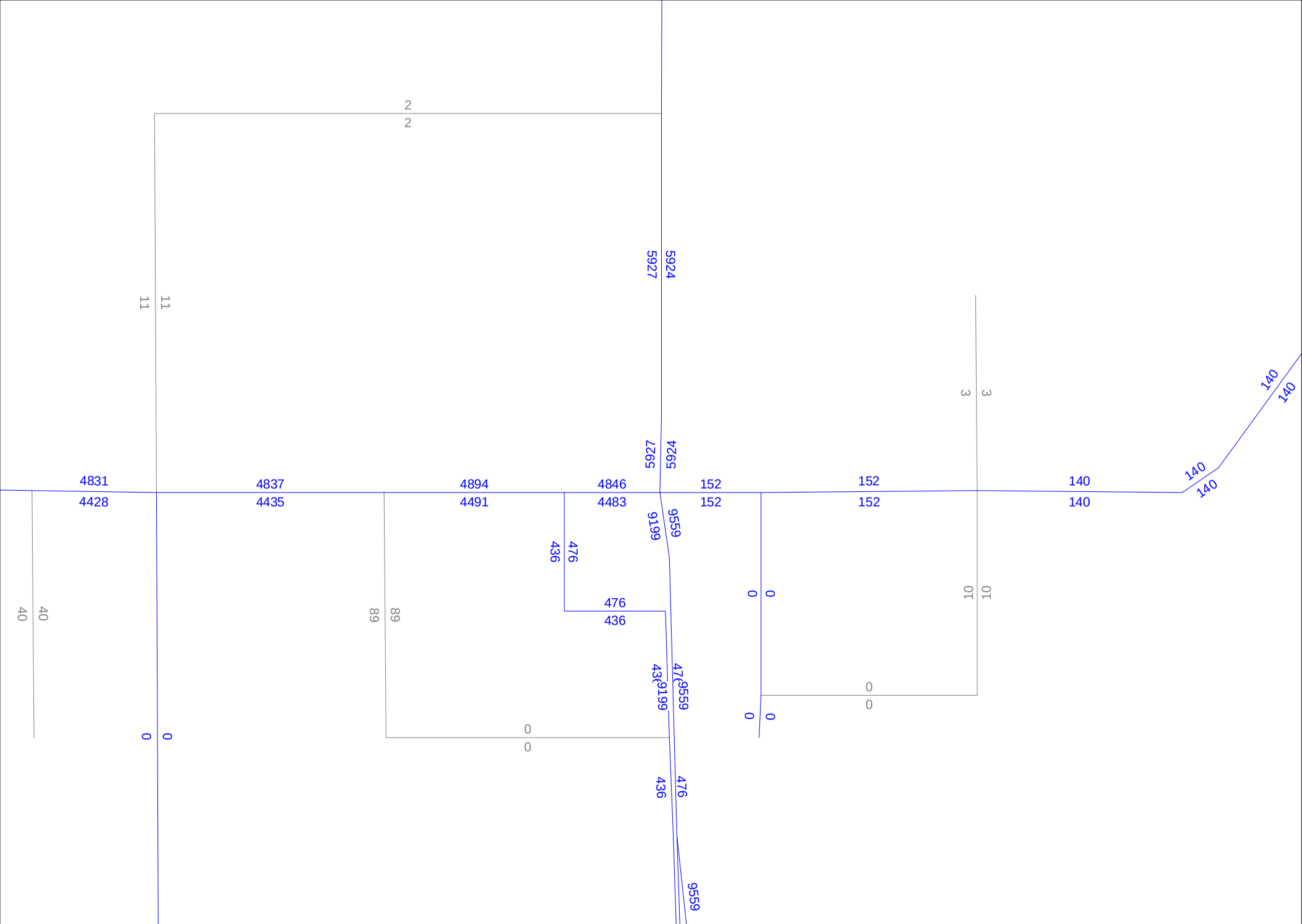
2000 Madera County Travel Demand Model
Daily Traffic Volumes



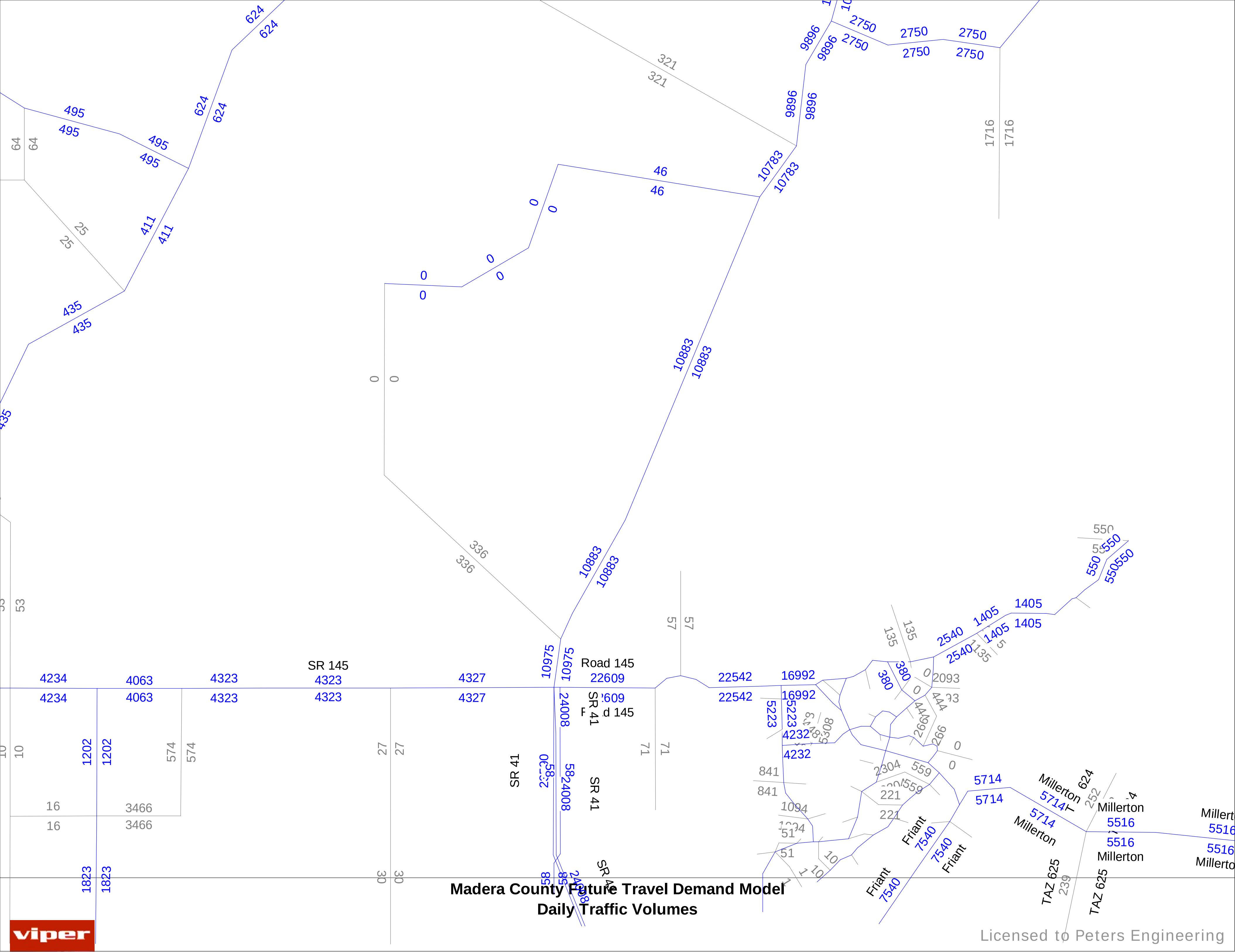
2000 Madera County Travel Demand Model
Daily Traffic Volumes

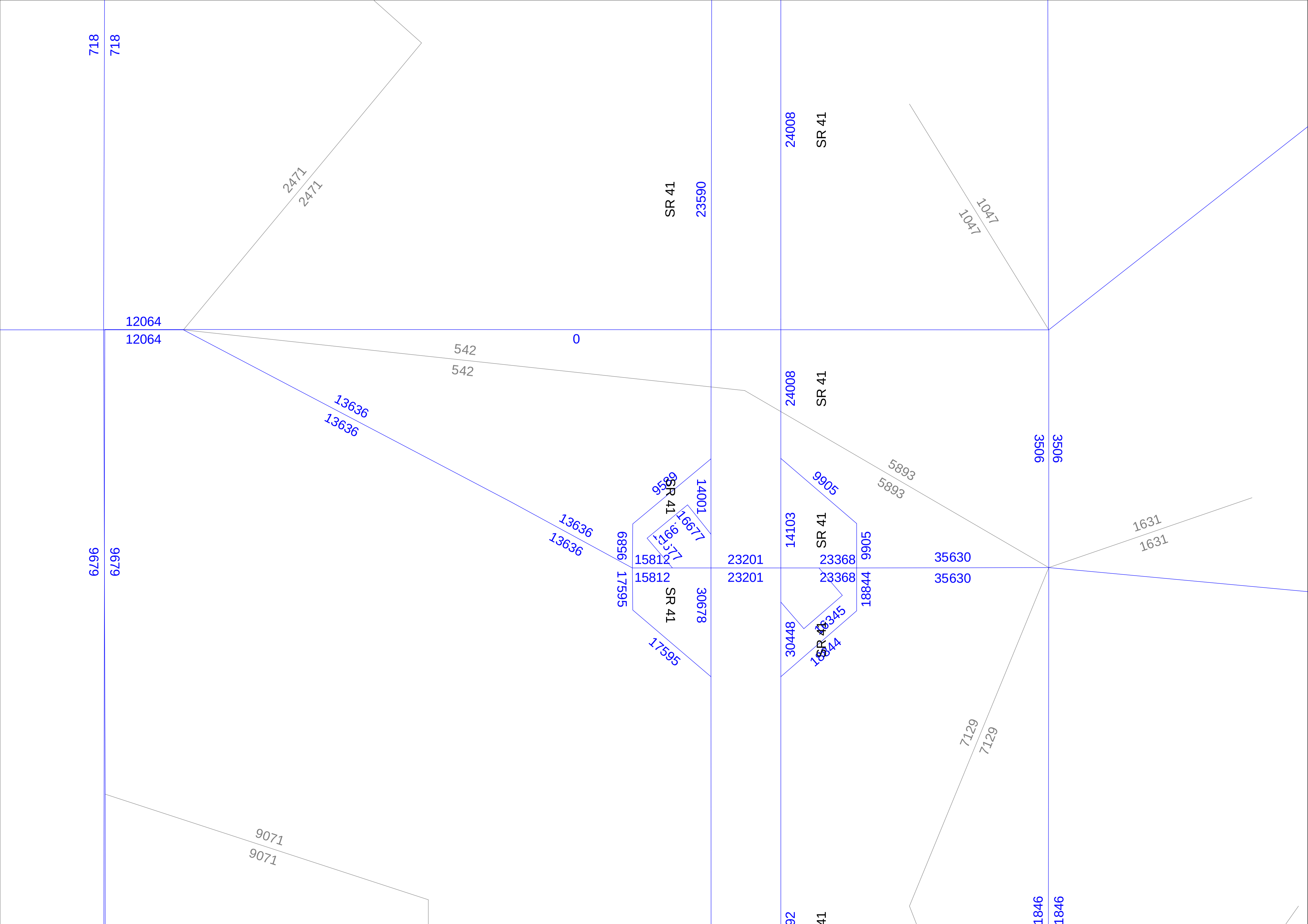


2000 Madera County Travel Demand Model
Daily Traffic Volumes

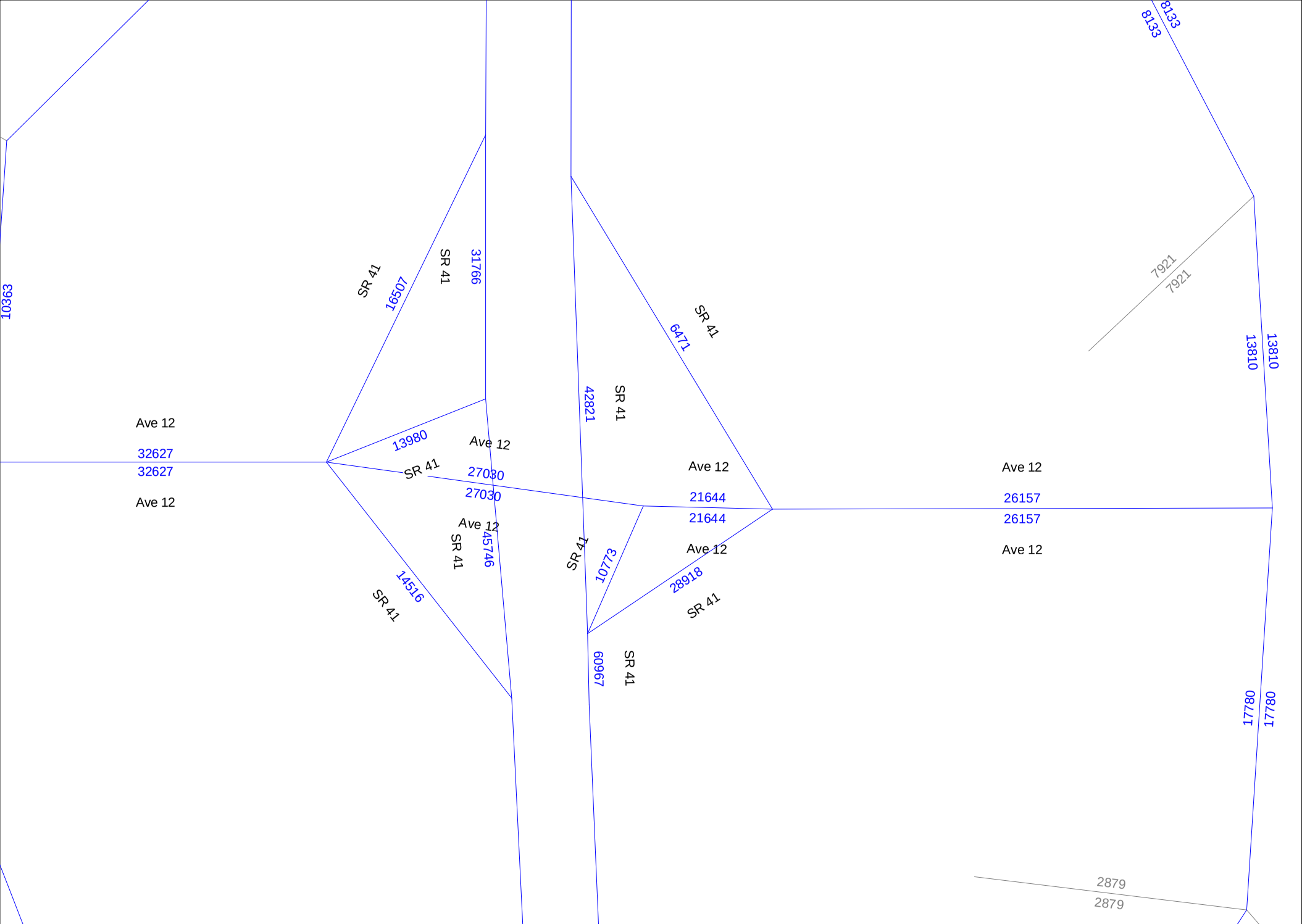


2000 Madera County Travel Demand Model
Daily Traffic Volumes





Madera County Future Travel Demand Model
Daily Traffic Volumes



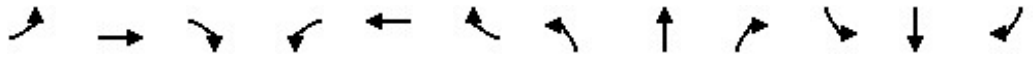
Madera County Future Travel Demand Model
Daily Traffic Volumes

ATTACHMENT 5
INTERSECION ANALYSES

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	1	27	6	243	626	1
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	1	31	7	276	711	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1002	712	712			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1002	712	712			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	93	99			
cM capacity (veh/h)	267	432	887			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	32	7	276	712
Volume Left	1	7	0	0
Volume Right	31	0	0	1
cSH	423	887	1700	1700
Volume to Capacity	0.08	0.01	0.16	0.42
Queue Length 95th (ft)	6	1	0	0
Control Delay (s)	14.2	9.1	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	14.2	0.2		0.0
Approach LOS	B			

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	43.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
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	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		0.97	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1795		3433	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1583	1770	1795		3433	3539	1583	1770	3539	1583
Volume (vph)	57	53	69	17	55	18	15	241	8	32	711	68
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	65	60	78	19	62	20	17	274	9	36	808	77
RTOR Reduction (vph)	0	0	64	0	16	0	0	0	4	0	0	34
Lane Group Flow (vph)	65	60	14	19	66	0	17	274	5	36	808	43
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4						2			6
Actuated Green, G (s)	3.1	11.8	11.8	1.1	9.8		0.9	35.5	35.5	2.9	37.5	37.5
Effective Green, g (s)	3.1	12.3	12.3	1.1	10.3		0.9	36.0	36.0	2.9	38.0	38.0
Actuated g/C Ratio	0.05	0.18	0.18	0.02	0.15		0.01	0.53	0.53	0.04	0.56	0.56
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5		4.0	4.5	4.5	4.0	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	80	336	285	29	271		45	1865	834	75	1969	881
v/s Ratio Prot	c0.04	0.03		0.01	c0.04		0.00	0.08		c0.02	c0.23	
v/s Ratio Perm			0.01						0.00			0.03
v/c Ratio	0.81	0.18	0.05	0.66	0.24		0.38	0.15	0.01	0.48	0.41	0.05
Uniform Delay, d1	32.3	23.7	23.2	33.4	25.6		33.4	8.3	7.7	32.0	8.7	6.9
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	44.4	0.3	0.1	42.6	0.5		5.2	0.0	0.0	4.8	0.1	0.0
Delay (s)	76.8	24.0	23.2	76.0	26.0		38.7	8.3	7.7	36.7	8.8	6.9
Level of Service	E	C	C	E	C		D	A	A	D	A	A
Approach Delay (s)		40.6			35.4			10.0			9.8	
Approach LOS		D			D			B			A	

Intersection Summary			
HCM Average Control Delay	15.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	68.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	42.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	16	222	113	209	784	12
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	18	255	130	240	901	14
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1401	901	915			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1401	901	915			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	86	24	83			
cM capacity (veh/h)	128	337	745			

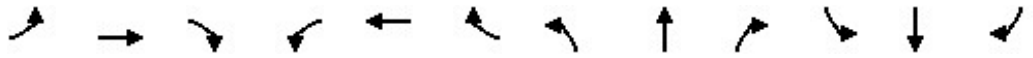
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	18	255	130	240	901	14
Volume Left	18	0	130	0	0	0
Volume Right	0	255	0	0	0	14
cSH	128	337	745	1700	1700	1700
Volume to Capacity	0.14	0.76	0.17	0.14	0.53	0.01
Queue Length 95th (ft)	12	148	16	0	0	0
Control Delay (s)	37.9	42.6	10.8	0.0	0.0	0.0
Lane LOS	E	E	B			
Approach Delay (s)	42.2		3.8		0.0	
Approach LOS	E					

Intersection Summary			
Average Delay	8.3		
Intersection Capacity Utilization	61.7%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	0	34	13	0	4	8	339	11	2	1010	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	1	0	38	14	0	4	9	377	12	2	1122	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1526	1534	1123	1565	1528	383	1123			389		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1526	1534	1123	1565	1528	383	1123			389		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	85	81	100	99	99			100		
cM capacity (veh/h)	94	114	250	76	115	665	622			1170		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	39	19	9	389	2	1123
Volume Left	1	14	9	0	2	0
Volume Right	38	4	0	12	0	1
cSH	239	96	622	1700	1170	1700
Volume to Capacity	0.16	0.20	0.01	0.23	0.00	0.66
Queue Length 95th (ft)	14	17	1	0	0	0
Control Delay (s)	23.0	51.6	10.9	0.0	8.1	0.0
Lane LOS	C	F	B		A	
Approach Delay (s)	23.0	51.6	0.2		0.0	
Approach LOS	C	F				

Intersection Summary				
Average Delay	1.3			
Intersection Capacity Utilization	67.5%	ICU Level of Service	C	
Analysis Period (min)	15			



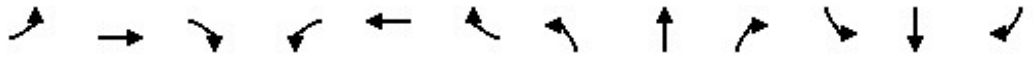
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.96	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1783	1583		1791	1583	1770	1863	1583	1770	3539	1583
Flt Permitted		0.96	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1783	1583		1791	1583	1770	1863	1583	1770	3539	1583
Volume (vph)	24	3	610	4	1	1	355	348	8	2	1148	45
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	27	3	685	4	1	1	399	391	9	2	1290	51
RTOR Reduction (vph)	0	0	352	0	0	1	0	0	3	0	0	18
Lane Group Flow (vph)	0	30	333	0	5	0	399	391	6	2	1290	33
Turn Type	Split		pm+ov	Split		Perm	Prot		Perm	Prot		Perm
Protected Phases	4	4	5	8	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)		4.8	21.1		3.2	3.2	16.3	55.8	55.8	0.7	40.2	40.2
Effective Green, g (s)		5.3	21.6		3.7	3.7	16.3	56.3	56.3	0.7	40.7	40.7
Actuated g/C Ratio		0.06	0.26		0.05	0.05	0.20	0.69	0.69	0.01	0.50	0.50
Clearance Time (s)		4.5	4.0		4.5	4.5	4.0	4.5	4.5	4.0	4.5	4.5
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		115	417		81	71	352	1279	1087	15	1757	786
v/s Ratio Prot		0.02	c0.16		c0.00		c0.23	0.21		0.00	c0.36	
v/s Ratio Perm			0.05			0.00			0.00			0.02
v/c Ratio		0.26	0.80		0.06	0.00	1.13	0.31	0.01	0.13	0.73	0.04
Uniform Delay, d1		36.5	28.2		37.5	37.4	32.9	5.1	4.0	40.3	16.4	10.6
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.2	10.2		0.3	0.0	89.3	0.1	0.0	4.0	1.6	0.0
Delay (s)		37.7	38.4		37.8	37.4	122.1	5.2	4.0	44.4	18.0	10.6
Level of Service		D	D		D	D	F	A	A	D	B	B
Approach Delay (s)		38.4			37.7			63.6			17.7	
Approach LOS		D			D			E			B	

Intersection Summary			
HCM Average Control Delay	35.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	82.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	82.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	1	5	15	634	435	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	5	16	689	473	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1195	473	474			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1195	473	474			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	99	99			
cM capacity (veh/h)	203	591	1088			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	7	16	689	474
Volume Left	1	16	0	0
Volume Right	5	0	0	1
cSH	448	1088	1700	1700
Volume to Capacity	0.01	0.01	0.41	0.28
Queue Length 95th (ft)	1	1	0	0
Control Delay (s)	13.2	8.4	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	13.2	0.2		0.0
Approach LOS	B			

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	43.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
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	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		0.97	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1738		3433	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1583	1770	1738		3433	3539	1583	1770	3539	1583
Volume (vph)	129	135	38	11	64	52	57	739	13	27	373	56
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	145	152	43	12	72	58	64	830	15	30	419	63
RTOR Reduction (vph)	0	0	30	0	37	0	0	0	8	0	0	36
Lane Group Flow (vph)	145	152	13	12	93	0	64	830	7	30	419	27
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4						2			6
Actuated Green, G (s)	9.6	23.0	23.0	1.2	14.6		4.7	34.9	34.9	2.9	33.1	33.1
Effective Green, g (s)	9.6	23.5	23.5	1.2	15.1		4.7	35.4	35.4	2.9	33.6	33.6
Actuated g/C Ratio	0.12	0.30	0.30	0.02	0.19		0.06	0.45	0.45	0.04	0.43	0.43
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5		4.0	4.5	4.5	4.0	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	215	554	471	27	332		204	1586	709	65	1505	673
v/s Ratio Prot	c0.08	c0.08		0.01	0.05		c0.02	c0.23		0.02	0.12	
v/s Ratio Perm			0.01						0.00			0.02
v/c Ratio	0.67	0.27	0.03	0.44	0.28		0.31	0.52	0.01	0.46	0.28	0.04
Uniform Delay, d1	33.2	21.2	19.7	38.6	27.3		35.6	15.7	12.1	37.3	14.8	13.3
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.1	0.3	0.0	11.2	0.5		0.9	0.3	0.0	5.1	0.1	0.0
Delay (s)	41.3	21.5	19.7	49.8	27.8		36.5	16.0	12.1	42.4	14.9	13.3
Level of Service	D	C	B	D	C		D	B	B	D	B	B
Approach Delay (s)		29.7			29.6			17.4			16.3	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM Average Control Delay	20.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	79.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	44.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	24	100	254	791	377	13
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	25	105	267	833	397	14
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1764	397	411			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1764	397	411			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	64	84	77			
cM capacity (veh/h)	71	653	1148			

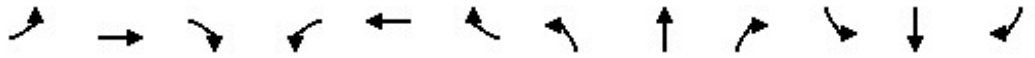
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	25	105	267	833	397	14
Volume Left	25	0	267	0	0	0
Volume Right	0	105	0	0	0	14
cSH	71	653	1148	1700	1700	1700
Volume to Capacity	0.36	0.16	0.23	0.49	0.23	0.01
Queue Length 95th (ft)	34	14	23	0	0	0
Control Delay (s)	81.7	11.6	9.1	0.0	0.0	0.0
Lane LOS	F	B	A			
Approach Delay (s)	25.1		2.2		0.0	
Approach LOS	D					

Intersection Summary			
Average Delay	3.5		
Intersection Capacity Utilization	51.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	3	0	14	8	0	2	9	1021	11	4	513	3
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	3	0	15	9	0	2	10	1086	12	4	546	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1663	1673	547	1680	1669	1092	549			1098		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1663	1673	547	1680	1669	1092	549			1098		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	96	100	97	88	100	99	99			99		
cM capacity (veh/h)	76	94	537	72	95	261	1021			636		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	18	11	10	1098	4	549
Volume Left	3	9	10	0	4	0
Volume Right	15	2	0	12	0	3
cSH	258	84	1021	1700	636	1700
Volume to Capacity	0.07	0.13	0.01	0.65	0.01	0.32
Queue Length 95th (ft)	6	10	1	0	1	0
Control Delay (s)	20.0	53.8	8.6	0.0	10.7	0.0
Lane LOS	C	F	A		B	
Approach Delay (s)	20.0	53.8	0.1		0.1	
Approach LOS	C	F				

Intersection Summary				
Average Delay	0.6			
Intersection Capacity Utilization	64.4%	ICU Level of Service	C	
Analysis Period (min)	15			



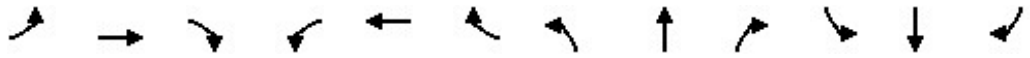
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.95	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1775	1583		1787	1583	1770	1863	1583	1770	3539	1583
Flt Permitted		0.95	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1775	1583		1787	1583	1770	1863	1583	1770	3539	1583
Volume (vph)	140	1	455	22	4	1	572	1005	11	5	491	58
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	143	1	464	22	4	1	584	1026	11	5	501	59
RTOR Reduction (vph)	0	0	275	0	0	1	0	0	2	0	0	40
Lane Group Flow (vph)	0	144	189	0	26	0	584	1026	9	5	501	19
Turn Type	Split		pm+ov	Split		Perm	Prot		Perm	Prot		Perm
Protected Phases	4	4	5	8	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)		10.2	31.3		4.6	4.6	21.1	45.0	45.0	0.8	24.7	24.7
Effective Green, g (s)		10.7	31.8		5.1	5.1	21.1	45.5	45.5	0.8	25.2	25.2
Actuated g/C Ratio		0.14	0.41		0.07	0.07	0.27	0.58	0.58	0.01	0.32	0.32
Clearance Time (s)		4.5	4.0		4.5	4.5	4.0	4.5	4.5	4.0	4.5	4.5
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		243	645		117	103	478	1085	922	18	1142	511
v/s Ratio Prot		c0.08	0.08		c0.01		c0.33	c0.55		0.00	0.14	
v/s Ratio Perm			0.04			0.00			0.01			0.01
v/c Ratio		0.59	0.29		0.22	0.00	1.22	0.95	0.01	0.28	0.44	0.04
Uniform Delay, d1		31.7	15.6		34.6	34.1	28.5	15.2	6.8	38.4	20.9	18.1
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		3.8	0.3		1.0	0.0	117.4	15.8	0.0	8.3	0.3	0.0
Delay (s)		35.5	15.8		35.6	34.1	145.9	31.0	6.8	46.6	21.1	18.2
Level of Service		D	B		D	C	F	C	A	D	C	B
Approach Delay (s)		20.5			35.5			72.2			21.1	
Approach LOS		C			D			E			C	

Intersection Summary			
HCM Average Control Delay	50.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	78.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	80.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	13	140	119	243	626	14
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	15	159	135	276	711	16
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1266	719	727			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1266	719	727			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	91	63	85			
cM capacity (veh/h)	158	428	876			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	174	135	276	727
Volume Left	15	135	0	0
Volume Right	159	0	0	16
cSH	374	876	1700	1700
Volume to Capacity	0.47	0.15	0.16	0.43
Queue Length 95th (ft)	60	14	0	0
Control Delay (s)	22.7	9.9	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	22.7	3.2		0.0
Approach LOS	C			

Intersection Summary			
Average Delay	4.0		
Intersection Capacity Utilization	59.8%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
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	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		0.97	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1772		3433	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1583	1770	1772		3433	3539	1583	1770	3539	1583
Volume (vph)	82	53	69	17	55	26	15	321	8	40	791	93
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	93	60	78	19	62	30	17	365	9	45	899	106
RTOR Reduction (vph)	0	0	62	0	24	0	0	0	5	0	0	50
Lane Group Flow (vph)	93	60	16	19	68	0	17	365	5	45	899	56
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4						2			6
Actuated Green, G (s)	5.3	13.6	13.6	1.1	9.4		0.9	33.5	33.5	2.8	35.4	35.4
Effective Green, g (s)	5.3	14.1	14.1	1.1	9.9		0.9	34.0	34.0	2.8	35.9	35.9
Actuated g/C Ratio	0.08	0.21	0.21	0.02	0.15		0.01	0.50	0.50	0.04	0.53	0.53
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5		4.0	4.5	4.5	4.0	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	138	386	328	29	258		45	1770	792	73	1868	836
v/s Ratio Prot	c0.05	0.03		0.01	c0.04		0.00	0.10		c0.03	c0.25	
v/s Ratio Perm			0.01						0.00			0.04
v/c Ratio	0.67	0.16	0.05	0.66	0.26		0.38	0.21	0.01	0.62	0.48	0.07
Uniform Delay, d1	30.5	22.1	21.6	33.3	25.8		33.3	9.5	8.5	32.1	10.2	7.9
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	12.2	0.2	0.1	42.6	0.5		5.2	0.1	0.0	14.5	0.2	0.0
Delay (s)	42.8	22.3	21.6	75.8	26.4		38.5	9.5	8.5	46.6	10.4	7.9
Level of Service	D	C	C	E	C		D	A	A	D	B	A
Approach Delay (s)		30.3			34.8			10.8			11.7	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM Average Control Delay	15.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	68.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	46.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	16	222	113	289	864	12
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	18	255	130	332	993	14
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1585	993	1007			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1585	993	1007			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	81	14	81			
cM capacity (veh/h)	97	298	688			

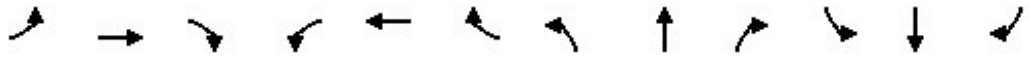
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	18	255	130	332	993	14
Volume Left	18	0	130	0	0	0
Volume Right	0	255	0	0	0	14
cSH	97	298	688	1700	1700	1700
Volume to Capacity	0.19	0.86	0.19	0.20	0.58	0.01
Queue Length 95th (ft)	17	187	17	0	0	0
Control Delay (s)	50.8	60.4	11.4	0.0	0.0	0.0
Lane LOS	F	F	B			
Approach Delay (s)	59.7		3.2		0.0	
Approach LOS	F					

Intersection Summary			
Average Delay	10.2		
Intersection Capacity Utilization	65.9%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	0	34	13	0	12	8	412	11	10	1083	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	1	0	38	14	0	13	9	458	12	11	1203	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1715	1714	1204	1745	1708	464	1204			470		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1715	1714	1204	1745	1708	464	1204			470		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	100	83	74	100	98	98			99		
cM capacity (veh/h)	68	88	224	55	89	598	579			1092		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	39	28	9	470	11	1204
Volume Left	1	14	9	0	11	0
Volume Right	38	13	0	12	0	1
cSH	211	98	579	1700	1092	1700
Volume to Capacity	0.18	0.28	0.02	0.28	0.01	0.71
Queue Length 95th (ft)	16	27	1	0	1	0
Control Delay (s)	25.9	55.9	11.3	0.0	8.3	0.0
Lane LOS	D	F	B		A	
Approach Delay (s)	25.9	55.9	0.2		0.1	
Approach LOS	D	F				

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	71.8%	ICU Level of Service	C
Analysis Period (min)	15		



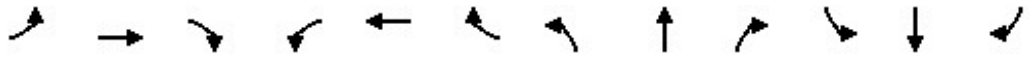
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.96	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1779	1583		1791	1583	1770	1863	1583	1770	3539	1583
Flt Permitted		0.96	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1779	1583		1791	1583	1770	1863	1583	1770	3539	1583
Volume (vph)	44	3	610	4	1	1	355	401	8	2	1201	65
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	49	3	685	4	1	1	399	451	9	2	1349	73
RTOR Reduction (vph)	0	0	344	0	0	1	0	0	3	0	0	24
Lane Group Flow (vph)	0	52	341	0	5	0	399	451	6	2	1349	49
Turn Type	Split		pm+ov	Split		Perm	Prot		Perm	Prot		Perm
Protected Phases	4	4	5	8	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)		6.7	22.9		3.4	3.4	16.2	55.3	55.3	0.8	39.9	39.9
Effective Green, g (s)		7.2	23.4		3.9	3.9	16.2	55.8	55.8	0.8	40.4	40.4
Actuated g/C Ratio		0.09	0.28		0.05	0.05	0.19	0.67	0.67	0.01	0.48	0.48
Clearance Time (s)		4.5	4.0		4.5	4.5	4.0	4.5	4.5	4.0	4.5	4.5
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		153	443		83	74	343	1242	1055	17	1708	764
v/s Ratio Prot		0.03	c0.15		c0.00		c0.23	0.24		0.00	c0.38	
v/s Ratio Perm			0.07			0.00			0.00			0.03
v/c Ratio		0.34	0.77		0.06	0.00	1.16	0.36	0.01	0.12	0.79	0.06
Uniform Delay, d1		36.0	27.7		38.1	38.0	33.8	6.1	4.7	41.1	18.1	11.6
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.3	8.1		0.3	0.0	100.7	0.2	0.0	3.1	2.5	0.0
Delay (s)		37.3	35.8		38.5	38.0	134.5	6.3	4.7	44.2	20.6	11.6
Level of Service		D	D		D	D	F	A	A	D	C	B
Approach Delay (s)		35.9			38.4			65.8			20.2	
Approach LOS		D			D			E			C	

Intersection Summary			
HCM Average Control Delay	37.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	83.7	Sum of lost time (s)	16.0
Intersection Capacity Utilization	84.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	5	50	60	634	435	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	54	65	689	473	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1295	476	478			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1295	476	478			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	91	94			
cM capacity (veh/h)	168	589	1084			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	60	65	689	478
Volume Left	5	65	0	0
Volume Right	54	0	0	5
cSH	480	1084	1700	1700
Volume to Capacity	0.12	0.06	0.41	0.28
Queue Length 95th (ft)	11	5	0	0
Control Delay (s)	13.6	8.5	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	13.6	0.7		0.0
Approach LOS	B			

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	43.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
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	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		0.97	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1733		3433	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1583	1770	1733		3433	3539	1583	1770	3539	1583
Volume (vph)	139	135	38	11	64	55	57	772	13	30	406	66
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	156	152	43	12	72	62	64	867	15	34	456	74
RTOR Reduction (vph)	0	0	31	0	41	0	0	0	9	0	0	44
Lane Group Flow (vph)	156	152	12	12	93	0	64	867	6	34	456	30
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4						2			6
Actuated Green, G (s)	8.5	19.8	19.8	1.1	12.4		4.0	30.0	30.0	2.5	28.5	28.5
Effective Green, g (s)	8.5	20.3	20.3	1.1	12.9		4.0	30.5	30.5	2.5	29.0	29.0
Actuated g/C Ratio	0.12	0.29	0.29	0.02	0.18		0.06	0.43	0.43	0.04	0.41	0.41
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5		4.0	4.5	4.5	4.0	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	214	537	456	28	318		195	1533	686	63	1458	652
v/s Ratio Prot	c0.09	c0.08		0.01	0.05		0.02	c0.24		c0.02	0.13	
v/s Ratio Perm			0.01						0.00			0.02
v/c Ratio	0.73	0.28	0.03	0.43	0.29		0.33	0.57	0.01	0.54	0.31	0.05
Uniform Delay, d1	29.8	19.4	18.0	34.3	24.8		31.9	15.0	11.4	33.4	14.0	12.4
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	11.7	0.3	0.0	10.2	0.5		1.0	0.5	0.0	8.6	0.1	0.0
Delay (s)	41.6	19.7	18.0	44.5	25.3		32.9	15.5	11.4	42.0	14.1	12.4
Level of Service	D	B	B	D	C		C	B	B	D	B	B
Approach Delay (s)		29.2			26.9			16.6			15.6	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM Average Control Delay	19.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	70.4	Sum of lost time (s)	8.0
Intersection Capacity Utilization	46.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	24	100	254	824	410	13
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	25	105	267	867	432	14
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1834	432	445			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1834	432	445			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	60	83	76			
cM capacity (veh/h)	64	624	1115			

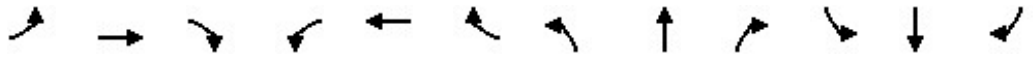
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	25	105	267	867	432	14
Volume Left	25	0	267	0	0	0
Volume Right	0	105	0	0	0	14
cSH	64	624	1115	1700	1700	1700
Volume to Capacity	0.40	0.17	0.24	0.51	0.25	0.01
Queue Length 95th (ft)	38	15	23	0	0	0
Control Delay (s)	94.9	11.9	9.2	0.0	0.0	0.0
Lane LOS	F	B	A			
Approach Delay (s)	28.0		2.2		0.0	
Approach LOS	D					

Intersection Summary			
Average Delay	3.6		
Intersection Capacity Utilization	53.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	3	0	14	8	0	5	9	1051	11	9	543	3
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	3	0	15	9	0	5	10	1118	12	10	578	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1741	1747	579	1755	1743	1124	581			1130		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1741	1747	579	1755	1743	1124	581			1130		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	95	100	97	87	100	98	99			98		
cM capacity (veh/h)	65	84	515	63	84	250	993			618		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	18	14	10	1130	10	581
Volume Left	3	9	10	0	10	0
Volume Right	15	5	0	12	0	3
cSH	233	89	993	1700	618	1700
Volume to Capacity	0.08	0.16	0.01	0.66	0.02	0.34
Queue Length 95th (ft)	6	13	1	0	1	0
Control Delay (s)	21.8	52.8	8.7	0.0	10.9	0.0
Lane LOS	C	F	A		B	
Approach Delay (s)	21.8	52.8	0.1		0.2	
Approach LOS	C	F				

Intersection Summary				
Average Delay	0.7			
Intersection Capacity Utilization	66.0%	ICU Level of Service	C	
Analysis Period (min)	15			



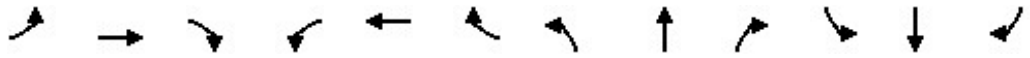
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.95	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1775	1583		1787	1583	1770	1863	1583	1770	3539	1583
Flt Permitted		0.95	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1775	1583		1787	1583	1770	1863	1583	1770	3539	1583
Volume (vph)	148	1	455	22	4	1	572	1028	11	5	514	66
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	151	1	464	22	4	1	584	1049	11	5	524	67
RTOR Reduction (vph)	0	0	275	0	0	1	0	0	2	0	0	45
Lane Group Flow (vph)	0	152	189	0	26	0	584	1049	9	5	524	22
Turn Type	Split		pm+ov	Split		Perm	Prot		Perm	Prot		Perm
Protected Phases	4	4	5	8	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)		10.4	31.5		4.6	4.6	21.1	45.2	45.2	0.8	24.9	24.9
Effective Green, g (s)		10.9	32.0		5.1	5.1	21.1	45.7	45.7	0.8	25.4	25.4
Actuated g/C Ratio		0.14	0.41		0.06	0.06	0.27	0.58	0.58	0.01	0.32	0.32
Clearance Time (s)		4.5	4.0		4.5	4.5	4.0	4.5	4.5	4.0	4.5	4.5
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		246	645		116	103	476	1085	922	18	1145	512
v/s Ratio Prot		c0.09	0.08		c0.01		c0.33	c0.56		0.00	0.15	
v/s Ratio Perm			0.04			0.00			0.01			0.01
v/c Ratio		0.62	0.29		0.22	0.00	1.23	0.97	0.01	0.28	0.46	0.04
Uniform Delay, d1		31.8	15.6		34.8	34.3	28.7	15.7	6.9	38.6	21.1	18.2
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		4.6	0.3		1.0	0.0	119.6	19.6	0.0	8.3	0.3	0.0
Delay (s)		36.4	15.9		35.8	34.3	148.3	35.3	6.9	46.8	21.4	18.2
Level of Service		D	B		D	C	F	D	A	D	C	B
Approach Delay (s)		21.0			35.8			75.2			21.2	
Approach LOS		C			D			E			C	

Intersection Summary			
HCM Average Control Delay	52.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	78.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	82.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	17	123	129	679	1235	27
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	18	134	140	738	1342	29
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2376	1357	1372			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2376	1357	1372			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	33	27	72			
cM capacity (veh/h)	27	182	500			

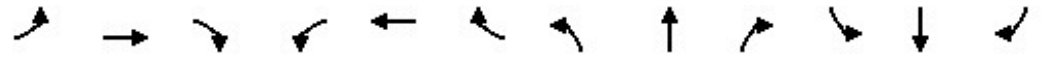
Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	152	140	738	1372
Volume Left	18	140	0	0
Volume Right	134	0	0	29
cSH	108	500	1700	1700
Volume to Capacity	1.41	0.28	0.43	0.81
Queue Length 95th (ft)	270	28	0	0
Control Delay (s)	301.7	15.0	0.0	0.0
Lane LOS	F	B		
Approach Delay (s)	301.7	2.4		0.0
Approach LOS	F			

Intersection Summary			
Average Delay	20.0		
Intersection Capacity Utilization	92.3%	ICU Level of Service	F
Analysis Period (min)	15		



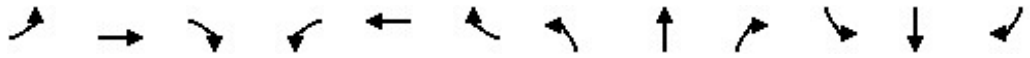
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		0.97	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1778		3433	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1583	1770	1778		3433	3539	1583	1770	3539	1583
Volume (vph)	139	355	267	1040	395	172	173	502	816	182	1089	151
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)	151	386	290	1130	429	187	188	546	887	198	1184	164
RTOR Reduction (vph)	0	0	99	0	13	0	0	0	427	0	0	87
Lane Group Flow (vph)	151	386	191	1130	603	0	188	546	460	198	1184	77
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4						2			6
Actuated Green, G (s)	12.4	26.1	26.1	36.0	49.7		8.0	30.0	30.0	10.0	32.0	32.0
Effective Green, g (s)	12.4	26.6	26.6	36.0	50.2		8.0	30.5	30.5	10.0	32.5	32.5
Actuated g/C Ratio	0.10	0.22	0.22	0.30	0.42		0.07	0.26	0.26	0.08	0.27	0.27
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5		4.0	4.5	4.5	4.0	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	184	416	354	535	749		231	906	405	149	966	432
v/s Ratio Prot	0.09	c0.21		c0.64	0.34		0.05	0.15		c0.11	c0.33	
v/s Ratio Perm			0.12						0.29			0.05
v/c Ratio	0.82	0.93	0.54	2.11	0.80		0.81	0.60	1.14	1.33	1.23	0.18
Uniform Delay, d1	52.3	45.3	40.8	41.5	30.2		54.8	39.0	44.3	54.5	43.3	33.1
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	24.5	26.7	1.6	506.8	6.3		19.3	1.1	87.2	186.7	110.8	0.2
Delay (s)	76.7	72.0	42.4	548.3	36.4		74.1	40.1	131.5	241.2	154.1	33.3
Level of Service	E	E	D	F	D		E	D	F	F	F	C
Approach Delay (s)		62.5			367.7			94.0			152.5	
Approach LOS		E			F			F			F	

Intersection Summary			
HCM Average Control Delay	188.5	HCM Level of Service	F
HCM Volume to Capacity ratio	1.43		
Actuated Cycle Length (s)	119.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	124.7%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



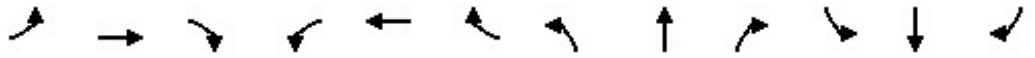
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0				4.0		4.0
Lane Util. Factor		0.91	1.00		0.91	1.00				0.97		1.00
Frt		1.00	0.85		1.00	0.85				1.00		0.85
Flt Protected		1.00	1.00		1.00	1.00				0.95		1.00
Satd. Flow (prot)		5085	1583		5085	1583				3433		1583
Flt Permitted		1.00	1.00		1.00	1.00				0.95		1.00
Satd. Flow (perm)		5085	1583		5085	1583				3433		1583
Volume (vph)	0	683	380	0	698	1249	0	0	0	404	0	64
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	742	413	0	759	1358	0	0	0	439	0	70
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	57
Lane Group Flow (vph)	0	742	413	0	759	1358	0	0	0	439	0	13
Turn Type			Free			Free				custom		custom
Protected Phases		4			8							
Permitted Phases			Free			Free				6		6
Actuated Green, G (s)		64.3	90.0		64.3	90.0				16.7		16.7
Effective Green, g (s)		64.8	90.0		64.8	90.0				17.2		17.2
Actuated g/C Ratio		0.72	1.00		0.72	1.00				0.19		0.19
Clearance Time (s)		4.5			4.5					4.5		4.5
Vehicle Extension (s)		3.0			3.0					3.0		3.0
Lane Grp Cap (vph)		3661	1583		3661	1583				656		303
v/s Ratio Prot		0.15			0.15							
v/s Ratio Perm			0.26			c0.86				0.13		0.01
v/c Ratio		0.20	0.26		0.21	0.86				0.67		0.04
Uniform Delay, d1		4.1	0.0		4.1	0.0				33.8		29.7
Progression Factor		1.00	1.00		0.34	1.00				1.00		1.00
Incremental Delay, d2		0.1	0.4		0.1	4.3				2.6		0.1
Delay (s)		4.3	0.4		1.5	4.3				36.4		29.8
Level of Service		A	A		A	A				D		C
Approach Delay (s)		2.9			3.3			0.0			35.5	
Approach LOS		A			A			A			D	

Intersection Summary			
HCM Average Control Delay	7.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	0.0
Intersection Capacity Utilization	31.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



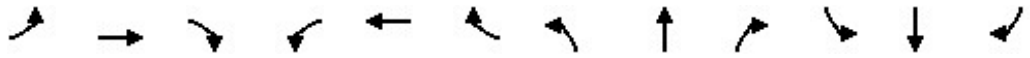
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0		4.0			
Lane Util. Factor		0.91			0.91	1.00	0.97		0.88			
Frt		1.00			1.00	0.85	1.00		0.85			
Flt Protected		1.00			1.00	1.00	0.95		1.00			
Satd. Flow (prot)		5085			5085	1583	3433		2787			
Flt Permitted		1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)		5085			5085	1583	3433		2787			
Volume (vph)	0	1087	0	0	1882	375	65	0	882	0	0	0
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	1182	0	0	2046	408	71	0	959	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	46	0	0	0
Lane Group Flow (vph)	0	1182	0	0	2046	408	71	0	913	0	0	0
Turn Type						Free	custom		custom			
Protected Phases		4			8							
Permitted Phases						Free	2		2			
Actuated Green, G (s)		47.6			47.6	90.0	33.4		33.4			
Effective Green, g (s)		48.1			48.1	90.0	33.9		33.9			
Actuated g/C Ratio		0.53			0.53	1.00	0.38		0.38			
Clearance Time (s)		4.5			4.5		4.5		4.5			
Vehicle Extension (s)		3.0			3.0		3.0		3.0			
Lane Grp Cap (vph)		2718			2718	1583	1293		1050			
v/s Ratio Prot		0.23			c0.40							
v/s Ratio Perm						0.26	0.02		c0.33			
v/c Ratio		0.43			0.75	0.26	0.05		0.87			
Uniform Delay, d1		12.7			16.3	0.0	17.9		26.0			
Progression Factor		0.57			1.00	1.00	1.00		1.00			
Incremental Delay, d2		0.5			2.0	0.4	0.0		7.8			
Delay (s)		7.7			18.3	0.4	17.9		33.8			
Level of Service		A			B	A	B		C			
Approach Delay (s)		7.7			15.3			32.7			0.0	
Approach LOS		A			B			C			A	

Intersection Summary			
HCM Average Control Delay	17.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	58.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
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		0.91	1.00		0.91	1.00				0.97		0.88
Frt		1.00	0.85		1.00	0.85				1.00		0.85
Flt Protected		1.00	1.00		1.00	1.00				0.95		1.00
Satd. Flow (prot)		5085	1583		5085	1583				3433		2787
Flt Permitted		1.00	1.00		1.00	1.00				0.95		1.00
Satd. Flow (perm)		5085	1583		5085	1583				3433		2787
Volume (vph)	0	1642	1186	0	1607	1546	0	0	0	327	0	737
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	1785	1289	0	1747	1680	0	0	0	355	0	801
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	8
Lane Group Flow (vph)	0	1785	1289	0	1747	1680	0	0	0	355	0	793
Turn Type			Free			Free				custom		custom
Protected Phases		4			8							
Permitted Phases			Free			Free				6		6
Actuated Green, G (s)		50.2	90.0		50.2	90.0				30.8		30.8
Effective Green, g (s)		50.7	90.0		50.7	90.0				31.3		31.3
Actuated g/C Ratio		0.56	1.00		0.56	1.00				0.35		0.35
Clearance Time (s)		4.5			4.5					4.5		4.5
Vehicle Extension (s)		3.0			3.0					3.0		3.0
Lane Grp Cap (vph)		2865	1583		2865	1583				1194		969
v/s Ratio Prot		0.35			0.34							
v/s Ratio Perm			0.81			c1.06				0.10		0.28
v/c Ratio		0.62	0.81		0.61	1.06				0.30		0.82
Uniform Delay, d1		13.2	0.0		13.1	45.0				21.4		26.8
Progression Factor		1.00	1.00		0.91	1.00				1.00		1.00
Incremental Delay, d2		1.0	4.7		0.6	37.0				0.1		5.5
Delay (s)		14.3	4.7		12.5	82.0				21.5		32.2
Level of Service		B	A		B	F				C		C
Approach Delay (s)		10.3			46.6			0.0			28.9	
Approach LOS		B			D			A			C	

Intersection Summary			
HCM Average Control Delay	29.3	HCM Level of Service	C
HCM Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	0.0
Intersection Capacity Utilization	63.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



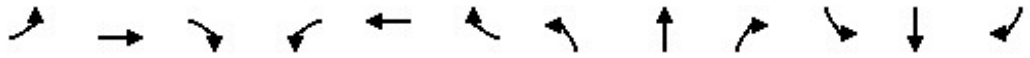
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0		4.0			
Lane Util. Factor		0.91			0.91	1.00	0.94		0.76			
Frt		1.00			1.00	0.85	1.00		0.85			
Flt Protected		1.00			1.00	1.00	0.95		1.00			
Satd. Flow (prot)		5085			5085	1583	4990		3610			
Flt Permitted		1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)		5085			5085	1583	4990		3610			
Volume (vph)	0	1900	0	0	1834	213	1319	0	903	0	0	0
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	2065	0	0	1993	232	1434	0	982	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	6	0	0	0
Lane Group Flow (vph)	0	2065	0	0	1993	232	1434	0	976	0	0	0
Turn Type						Free	custom		custom			
Protected Phases		4			8							
Permitted Phases						Free	2		2			
Actuated Green, G (s)		47.1			47.1	90.0	33.9		33.9			
Effective Green, g (s)		47.6			47.6	90.0	34.4		34.4			
Actuated g/C Ratio		0.53			0.53	1.00	0.38		0.38			
Clearance Time (s)		4.5			4.5		4.5		4.5			
Vehicle Extension (s)		3.0			3.0		3.0		3.0			
Lane Grp Cap (vph)		2689			2689	1583	1907		1380			
v/s Ratio Prot		c0.41			0.39							
v/s Ratio Perm						0.15	c0.29		0.27			
v/c Ratio		0.77			0.74	0.15	0.75		0.71			
Uniform Delay, d1		16.8			16.4	0.0	24.1		23.5			
Progression Factor		0.59			1.00	1.00	1.00		1.00			
Incremental Delay, d2		1.8			1.9	0.2	1.7		1.7			
Delay (s)		11.7			18.3	0.2	25.8		25.2			
Level of Service		B			B	A	C		C			
Approach Delay (s)		11.7			16.4			25.6			0.0	
Approach LOS		B			B			C			A	

Intersection Summary			
HCM Average Control Delay	18.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	68.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	62	254	246	1351	975	58
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	67	276	267	1468	1060	63
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	3095	1091	1123			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	3095	1091	1123			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	0	57			
cM capacity (veh/h)	7	261	622			

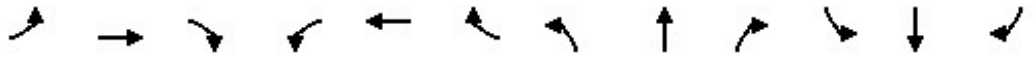
Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	343	267	1468	1123
Volume Left	67	267	0	0
Volume Right	276	0	0	63
cSH	34	622	1700	1700
Volume to Capacity	10.12	0.43	0.86	0.66
Queue Length 95th (ft)	Err	54	0	0
Control Delay (s)	Err	15.1	0.0	0.0
Lane LOS	F	C		
Approach Delay (s)	Err	2.3		0.0
Approach LOS	F			

Intersection Summary			
Average Delay	1073.8		
Intersection Capacity Utilization	97.6%	ICU Level of Service	F
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
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	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		0.97	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1771		3433	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1583	1770	1771		3433	3539	1583	1770	3539	1583
Volume (vph)	243	441	256	983	400	195	383	1152	1128	294	783	129
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)	264	479	278	1068	435	212	416	1252	1226	320	851	140
RTOR Reduction (vph)	0	0	153	0	14	0	0	0	311	0	0	101
Lane Group Flow (vph)	264	479	125	1068	633	0	416	1252	915	320	851	39
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4						2			6
Actuated Green, G (s)	11.0	27.0	27.0	28.0	44.0		15.0	36.0	36.0	12.0	33.0	33.0
Effective Green, g (s)	11.0	27.5	27.5	28.0	44.5		15.0	36.5	36.5	12.0	33.5	33.5
Actuated g/C Ratio	0.09	0.23	0.23	0.23	0.37		0.12	0.30	0.30	0.10	0.28	0.28
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5		4.0	4.5	4.5	4.0	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	162	427	363	413	657		429	1076	481	177	988	442
v/s Ratio Prot	0.15	c0.26		c0.60	0.36		0.12	0.35		c0.18	0.24	
v/s Ratio Perm			0.08						c0.58			0.02
v/c Ratio	1.63	1.12	0.35	2.59	0.96		0.97	1.16	1.90	1.81	0.86	0.09
Uniform Delay, d1	54.5	46.2	38.7	46.0	36.9		52.3	41.8	41.8	54.0	41.0	32.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	309.6	81.1	0.6	720.7	26.0		35.1	84.0	413.7	385.0	7.8	0.1
Delay (s)	364.1	127.3	39.3	766.7	62.9		87.4	125.8	455.5	439.0	48.9	32.1
Level of Service	F	F	D	F	E		F	F	F	F	D	C
Approach Delay (s)		164.6			501.2			259.9			142.3	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	283.3	HCM Level of Service	F
HCM Volume to Capacity ratio	1.87		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	139.1%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

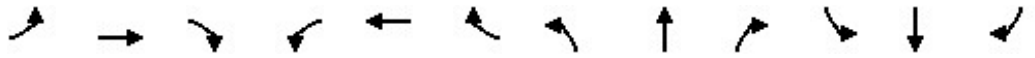


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0				4.0		4.0
Lane Util. Factor		0.91	1.00		0.91	1.00				0.97		1.00
Frt		1.00	0.85		1.00	0.85				1.00		0.85
Flt Protected		1.00	1.00		1.00	1.00				0.95		1.00
Satd. Flow (prot)		5085	1583		5085	1583				3433		1583
Flt Permitted		1.00	1.00		1.00	1.00				0.95		1.00
Satd. Flow (perm)		5085	1583		5085	1583				3433		1583
Volume (vph)	0	667	394	0	709	1006	0	0	0	505	0	170
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	725	428	0	771	1093	0	0	0	549	0	185
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	89
Lane Group Flow (vph)	0	725	428	0	771	1093	0	0	0	549	0	96
Turn Type			Free			Free				custom		custom
Protected Phases		4			8							
Permitted Phases			Free			Free				6		6
Actuated Green, G (s)		62.0	90.0		62.0	90.0				19.0		19.0
Effective Green, g (s)		62.5	90.0		62.5	90.0				19.5		19.5
Actuated g/C Ratio		0.69	1.00		0.69	1.00				0.22		0.22
Clearance Time (s)		4.5			4.5					4.5		4.5
Vehicle Extension (s)		3.0			3.0					3.0		3.0
Lane Grp Cap (vph)		3531	1583		3531	1583				744		343
v/s Ratio Prot		0.14			0.15							
v/s Ratio Perm			0.27			c0.69				0.16		0.06
v/c Ratio		0.21	0.27		0.22	0.69				0.74		0.28
Uniform Delay, d1		4.9	0.0		5.0	0.0				32.9		29.4
Progression Factor		1.00	1.00		0.48	1.00				1.00		1.00
Incremental Delay, d2		0.1	0.4		0.1	1.2				3.8		0.5
Delay (s)		5.0	0.4		2.4	1.2				36.7		29.9
Level of Service		A	A		A	A				D		C
Approach Delay (s)		3.3			1.7			0.0			35.0	
Approach LOS		A			A			A			C	

Intersection Summary			
HCM Average Control Delay	8.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	0.0
Intersection Capacity Utilization	34.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
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	1.00	0.97		0.88			
Frt		1.00			1.00	0.85	1.00		0.85			
Flt Protected		1.00			1.00	1.00	0.95		1.00			
Satd. Flow (prot)		5085			5085	1583	3433		2787			
Flt Permitted		1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)		5085			5085	1583	3433		2787			
Volume (vph)	0	1172	0	0	1512	562	203	0	1474	0	0	0
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	1274	0	0	1643	611	221	0	1602	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	4	0	0	0
Lane Group Flow (vph)	0	1274	0	0	1643	611	221	0	1598	0	0	0
Turn Type						Free	custom		custom			
Protected Phases		4			8							
Permitted Phases						Free	2		2			
Actuated Green, G (s)		29.7			29.7	90.0	51.3		51.3			
Effective Green, g (s)		30.2			30.2	90.0	51.8		51.8			
Actuated g/C Ratio		0.34			0.34	1.00	0.58		0.58			
Clearance Time (s)		4.5			4.5		4.5		4.5			
Vehicle Extension (s)		3.0			3.0		3.0		3.0			
Lane Grp Cap (vph)		1706			1706	1583	1976		1604			
v/s Ratio Prot		0.25			c0.32							
v/s Ratio Perm						0.39	0.06		c0.57			
v/c Ratio		0.75			0.96	0.39	0.11		1.00			
Uniform Delay, d1		26.5			29.4	0.0	8.7		19.0			
Progression Factor		0.68			1.00	1.00	1.00		1.00			
Incremental Delay, d2		2.8			14.6	0.7	0.0		21.4			
Delay (s)		20.9			44.0	0.7	8.7		40.4			
Level of Service		C			D	A	A		D			
Approach Delay (s)		20.9			32.3			36.5			0.0	
Approach LOS		C			C			D			A	

Intersection Summary			
HCM Average Control Delay	31.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	80.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
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		0.91	1.00		0.91	1.00				0.97		0.88
Frt		1.00	0.85		1.00	0.85				1.00		0.85
Flt Protected		1.00	1.00		1.00	1.00				0.95		1.00
Satd. Flow (prot)		5085	1583		5085	1583				3433		2787
Flt Permitted		1.00	1.00		1.00	1.00				0.95		1.00
Satd. Flow (perm)		5085	1583		5085	1583				3433		2787
Volume (vph)	0	1664	1169	0	2150	1628	0	0	0	382	0	946
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	1809	1271	0	2337	1770	0	0	0	415	0	1028
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	2
Lane Group Flow (vph)	0	1809	1271	0	2337	1770	0	0	0	415	0	1026
Turn Type			Free			Free				custom		custom
Protected Phases		4			8							
Permitted Phases			Free			Free				6		6
Actuated Green, G (s)		45.5	90.0		45.5	90.0				35.5		35.5
Effective Green, g (s)		46.0	90.0		46.0	90.0				36.0		36.0
Actuated g/C Ratio		0.51	1.00		0.51	1.00				0.40		0.40
Clearance Time (s)		4.5			4.5					4.5		4.5
Vehicle Extension (s)		3.0			3.0					3.0		3.0
Lane Grp Cap (vph)		2599	1583		2599	1583				1373		1115
v/s Ratio Prot		0.36			0.46							
v/s Ratio Perm			0.80			c1.12				0.12		0.37
v/c Ratio		0.70	0.80		0.90	1.12				0.30		0.92
Uniform Delay, d1		16.7	0.0		19.9	45.0				18.4		25.6
Progression Factor		1.00	1.00		0.88	1.00				1.00		1.00
Incremental Delay, d2		1.6	4.4		2.5	57.4				0.1		12.1
Delay (s)		18.3	4.4		20.1	102.4				18.6		37.8
Level of Service		B	A		C	F				B		D
Approach Delay (s)		12.5			55.5			0.0			32.3	
Approach LOS		B			E			A			C	

Intersection Summary			
HCM Average Control Delay	36.3	HCM Level of Service	D
HCM Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	0.0
Intersection Capacity Utilization	81.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

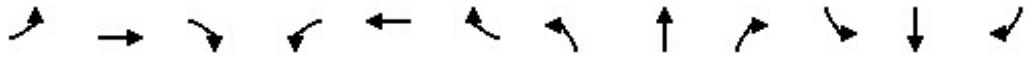
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0		4.0			
Lane Util. Factor		0.91			0.91	1.00	0.94		0.76			
Frt		1.00			1.00	0.85	1.00		0.85			
Flt Protected		1.00			1.00	1.00	0.95		1.00			
Satd. Flow (prot)		5085			5085	1583	4990		3610			
Flt Permitted		1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)		5085			5085	1583	4990		3610			
Volume (vph)	0	1862	0	0	1692	409	2086	0	1611	0	0	0
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	2024	0	0	1839	445	2267	0	1751	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	1	0	0	0
Lane Group Flow (vph)	0	2024	0	0	1839	445	2267	0	1750	0	0	0
Turn Type						Free	custom		custom			
Protected Phases		4			8							
Permitted Phases						Free	2		2			
Actuated Green, G (s)		36.1			36.1	90.0	44.9		44.9			
Effective Green, g (s)		36.6			36.6	90.0	45.4		45.4			
Actuated g/C Ratio		0.41			0.41	1.00	0.50		0.50			
Clearance Time (s)		4.5			4.5		4.5		4.5			
Vehicle Extension (s)		3.0			3.0		3.0		3.0			
Lane Grp Cap (vph)		2068			2068	1583	2517		1821			
v/s Ratio Prot		c0.40			0.36							
v/s Ratio Perm						0.28	0.45		c0.48			
v/c Ratio		0.98			0.89	0.28	0.90		0.96			
Uniform Delay, d1		26.3			24.8	0.0	20.3		21.4			
Progression Factor		0.71			1.00	1.00	1.00		1.00			
Incremental Delay, d2		12.8			5.1	0.4	5.7		13.7			
Delay (s)		31.5			29.9	0.4	26.0		35.1			
Level of Service		C			C	A	C		D			
Approach Delay (s)		31.5			24.2			30.0			0.0	
Approach LOS		C			C			C			A	

Intersection Summary			
HCM Average Control Delay	28.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	82.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	25	191	197	679	1235	35
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	27	208	214	738	1342	38
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2528	1361	1380			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2528	1361	1380			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	0	57			
cM capacity (veh/h)	17	181	496			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	235	214	738	1380
Volume Left	27	214	0	0
Volume Right	208	0	0	38
cSH	86	496	1700	1700
Volume to Capacity	2.72	0.43	0.43	0.81
Queue Length 95th (ft)	562	54	0	0
Control Delay (s)	879.7	17.6	0.0	0.0
Lane LOS	F	C		
Approach Delay (s)	879.7	4.0		0.0
Approach LOS	F			

Intersection Summary			
Average Delay	81.9		
Intersection Capacity Utilization	101.2%	ICU Level of Service	G
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
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	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		0.97	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1775		3433	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1583	1770	1775		3433	3539	1583	1770	3539	1583
Volume (vph)	164	355	267	1040	395	180	173	582	816	190	1169	176
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)	178	386	290	1130	429	196	188	633	887	207	1271	191
RTOR Reduction (vph)	0	0	99	0	14	0	0	0	416	0	0	94
Lane Group Flow (vph)	178	386	191	1130	611	0	188	633	471	207	1271	97
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4						2			6
Actuated Green, G (s)	13.0	26.1	26.1	35.0	48.1		8.0	31.0	31.0	10.0	33.0	33.0
Effective Green, g (s)	13.0	26.6	26.6	35.0	48.6		8.0	31.5	31.5	10.0	33.5	33.5
Actuated g/C Ratio	0.11	0.22	0.22	0.29	0.41		0.07	0.26	0.26	0.08	0.28	0.28
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5		4.0	4.5	4.5	4.0	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	193	416	354	520	724		231	936	419	149	995	445
v/s Ratio Prot	0.10	c0.21		c0.64	0.34		0.05	0.18		c0.12	c0.36	
v/s Ratio Perm			0.12						0.30			0.06
v/c Ratio	0.92	0.93	0.54	2.17	0.84		0.81	0.68	1.13	1.39	1.28	0.22
Uniform Delay, d1	52.5	45.3	40.8	42.0	31.8		54.8	39.2	43.8	54.5	42.8	32.8
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	43.2	26.7	1.6	534.2	8.9		19.3	2.0	82.6	211.0	132.7	0.2
Delay (s)	95.7	72.0	42.4	576.3	40.7		74.1	41.2	126.4	265.5	175.5	33.0
Level of Service	F	E	D	F	D		E	D	F	F	F	C
Approach Delay (s)		66.9			385.6			89.1			170.3	
Approach LOS		E			F			F			F	

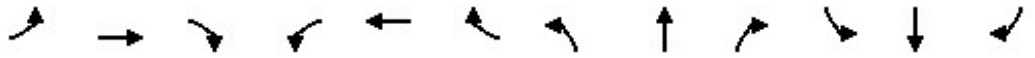
Intersection Summary			
HCM Average Control Delay	195.5	HCM Level of Service	F
HCM Volume to Capacity ratio	1.46		
Actuated Cycle Length (s)	119.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	126.9%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
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		0.91	1.00		0.91	1.00				0.97		1.00
Frt		1.00	0.85		1.00	0.85				1.00		0.85
Flt Protected		1.00	1.00		1.00	1.00				0.95		1.00
Satd. Flow (prot)		5085	1583		5085	1583				3433		1583
Flt Permitted		1.00	1.00		1.00	1.00				0.95		1.00
Satd. Flow (perm)		5085	1583		5085	1583				3433		1583
Volume (vph)	0	683	380	0	698	1249	0	0	0	412	0	64
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	742	413	0	759	1358	0	0	0	448	0	70
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	57
Lane Group Flow (vph)	0	742	413	0	759	1358	0	0	0	448	0	13
Turn Type			Free			Free				custom		custom
Protected Phases		4			8							
Permitted Phases			Free			Free				6		6
Actuated Green, G (s)		64.2	90.0		64.2	90.0				16.8		16.8
Effective Green, g (s)		64.7	90.0		64.7	90.0				17.3		17.3
Actuated g/C Ratio		0.72	1.00		0.72	1.00				0.19		0.19
Clearance Time (s)		4.5			4.5					4.5		4.5
Vehicle Extension (s)		3.0			3.0					3.0		3.0
Lane Grp Cap (vph)		3656	1583		3656	1583				660		304
v/s Ratio Prot		0.15			0.15							
v/s Ratio Perm			0.26			c0.86				0.13		0.01
v/c Ratio		0.20	0.26		0.21	0.86				0.68		0.04
Uniform Delay, d1		4.2	0.0		4.2	0.0				33.8		29.6
Progression Factor		1.00	1.00		0.34	1.00				1.00		1.00
Incremental Delay, d2		0.1	0.4		0.1	4.3				2.8		0.1
Delay (s)		4.3	0.4		1.5	4.3				36.6		29.7
Level of Service		A	A		A	A				D		C
Approach Delay (s)		2.9			3.3			0.0			35.6	
Approach LOS		A			A			A			D	

Intersection Summary			
HCM Average Control Delay	7.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	0.0
Intersection Capacity Utilization	31.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

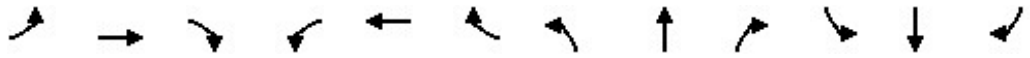
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0		4.0			
Lane Util. Factor		0.91			0.91	1.00	0.97		0.88			
Frt		1.00			1.00	0.85	1.00		0.85			
Flt Protected		1.00			1.00	1.00	0.95		1.00			
Satd. Flow (prot)		5085			5085	1583	3433		2787			
Flt Permitted		1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)		5085			5085	1583	3433		2787			
Volume (vph)	0	1095	0	0	1882	383	65	0	882	0	0	0
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	1190	0	0	2046	416	71	0	959	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	46	0	0	0
Lane Group Flow (vph)	0	1190	0	0	2046	416	71	0	913	0	0	0
Turn Type						Free	custom		custom			
Protected Phases		4			8							
Permitted Phases						Free	2		2			
Actuated Green, G (s)		47.6			47.6	90.0	33.4		33.4			
Effective Green, g (s)		48.1			48.1	90.0	33.9		33.9			
Actuated g/C Ratio		0.53			0.53	1.00	0.38		0.38			
Clearance Time (s)		4.5			4.5		4.5		4.5			
Vehicle Extension (s)		3.0			3.0		3.0		3.0			
Lane Grp Cap (vph)		2718			2718	1583	1293		1050			
v/s Ratio Prot		0.23			c0.40							
v/s Ratio Perm						0.26	0.02		c0.33			
v/c Ratio		0.44			0.75	0.26	0.05		0.87			
Uniform Delay, d1		12.7			16.3	0.0	17.9		26.0			
Progression Factor		0.56			1.00	1.00	1.00		1.00			
Incremental Delay, d2		0.5			2.0	0.4	0.0		7.8			
Delay (s)		7.7			18.3	0.4	17.9		33.9			
Level of Service		A			B	A	B		C			
Approach Delay (s)		7.7			15.3			32.8			0.0	
Approach LOS		A			B			C			A	

Intersection Summary			
HCM Average Control Delay	17.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	58.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
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		0.91	1.00		0.91	1.00				0.97		0.88
Frt		1.00	0.85		1.00	0.85				1.00		0.85
Flt Protected		1.00	1.00		1.00	1.00				0.95		1.00
Satd. Flow (prot)		5085	1583		5085	1583				3433		2787
Flt Permitted		1.00	1.00		1.00	1.00				0.95		1.00
Satd. Flow (perm)		5085	1583		5085	1583				3433		2787
Volume (vph)	0	1662	1186	0	1607	1546	0	0	0	327	0	757
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	1807	1289	0	1747	1680	0	0	0	355	0	823
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	7
Lane Group Flow (vph)	0	1807	1289	0	1747	1680	0	0	0	355	0	816
Turn Type			Free			Free				custom		custom
Protected Phases		4			8							
Permitted Phases			Free			Free				6		6
Actuated Green, G (s)		49.5	90.0		49.5	90.0				31.5		31.5
Effective Green, g (s)		50.0	90.0		50.0	90.0				32.0		32.0
Actuated g/C Ratio		0.56	1.00		0.56	1.00				0.36		0.36
Clearance Time (s)		4.5			4.5					4.5		4.5
Vehicle Extension (s)		3.0			3.0					3.0		3.0
Lane Grp Cap (vph)		2825	1583		2825	1583				1221		991
v/s Ratio Prot		0.36			0.34							
v/s Ratio Perm			0.81			c1.06				0.10		0.29
v/c Ratio		0.64	0.81		0.62	1.06				0.29		0.82
Uniform Delay, d1		13.8	0.0		13.5	45.0				20.8		26.4
Progression Factor		1.00	1.00		0.93	1.00				1.00		1.00
Incremental Delay, d2		1.1	4.7		0.7	37.0				0.1		5.6
Delay (s)		14.9	4.7		13.2	82.0				21.0		32.1
Level of Service		B	A		B	F				C		C
Approach Delay (s)		10.7			46.9			0.0			28.7	
Approach LOS		B			D			A			C	

Intersection Summary			
HCM Average Control Delay	29.6	HCM Level of Service	C
HCM Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	0.0
Intersection Capacity Utilization	64.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



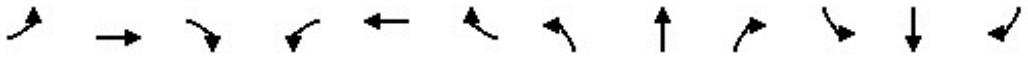
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0		4.0			
Lane Util. Factor		0.91			0.91	1.00	0.94		0.76			
Frt		1.00			1.00	0.85	1.00		0.85			
Flt Protected		1.00			1.00	1.00	0.95		1.00			
Satd. Flow (prot)		5085			5085	1583	4990		3610			
Flt Permitted		1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)		5085			5085	1583	4990		3610			
Volume (vph)	0	1900	0	0	1834	213	1319	0	903	0	0	0
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	2065	0	0	1993	232	1434	0	982	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	6	0	0	0
Lane Group Flow (vph)	0	2065	0	0	1993	232	1434	0	976	0	0	0
Turn Type						Free	custom		custom			
Protected Phases		4			8							
Permitted Phases						Free	2		2			
Actuated Green, G (s)		47.1			47.1	90.0	33.9		33.9			
Effective Green, g (s)		47.6			47.6	90.0	34.4		34.4			
Actuated g/C Ratio		0.53			0.53	1.00	0.38		0.38			
Clearance Time (s)		4.5			4.5		4.5		4.5			
Vehicle Extension (s)		3.0			3.0		3.0		3.0			
Lane Grp Cap (vph)		2689			2689	1583	1907		1380			
v/s Ratio Prot		c0.41			0.39							
v/s Ratio Perm						0.15	c0.29		0.27			
v/c Ratio		0.77			0.74	0.15	0.75		0.71			
Uniform Delay, d1		16.8			16.4	0.0	24.1		23.5			
Progression Factor		0.58			1.00	1.00	1.00		1.00			
Incremental Delay, d2		1.8			1.9	0.2	1.7		1.7			
Delay (s)		11.6			18.3	0.2	25.8		25.2			
Level of Service		B			B	A	C		C			
Approach Delay (s)		11.6			16.4			25.6			0.0	
Approach LOS		B			B			C			A	

Intersection Summary			
HCM Average Control Delay	18.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	68.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	65	281	273	1351	975	61
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	71	305	297	1468	1060	66
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	3155	1093	1126			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	3155	1093	1126			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	0	52			
cM capacity (veh/h)	6	261	620			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	376	297	1468	1126
Volume Left	71	297	0	0
Volume Right	305	0	0	66
cSH	30	620	1700	1700
Volume to Capacity	12.54	0.48	0.86	0.66
Queue Length 95th (ft)	Err	65	0	0
Control Delay (s)	Err	16.0	0.0	0.0
Lane LOS	F	C		
Approach Delay (s)	Err	2.7		0.0
Approach LOS	F			

Intersection Summary			
Average Delay	1152.4		
Intersection Capacity Utilization	101.1%	ICU Level of Service	G
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
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	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		0.97	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1770		3433	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1583	1770	1770		3433	3539	1583	1770	3539	1583
Volume (vph)	253	441	256	983	400	198	383	1185	1128	297	816	139
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)	275	479	278	1068	435	215	416	1288	1226	323	887	151
RTOR Reduction (vph)	0	0	152	0	15	0	0	0	311	0	0	107
Lane Group Flow (vph)	275	479	126	1068	635	0	416	1288	915	323	887	44
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4						2			6
Actuated Green, G (s)	11.0	27.0	27.0	28.0	44.0		15.0	36.0	36.0	12.0	33.0	33.0
Effective Green, g (s)	11.0	27.5	27.5	28.0	44.5		15.0	36.5	36.5	12.0	33.5	33.5
Actuated g/C Ratio	0.09	0.23	0.23	0.23	0.37		0.12	0.30	0.30	0.10	0.28	0.28
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5		4.0	4.5	4.5	4.0	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	162	427	363	413	656		429	1076	481	177	988	442
v/s Ratio Prot	0.16	c0.26		c0.60	0.36		0.12	0.36		c0.18	0.25	
v/s Ratio Perm			0.08						c0.58			0.03
v/c Ratio	1.70	1.12	0.35	2.59	0.97		0.97	1.20	1.90	1.82	0.90	0.10
Uniform Delay, d1	54.5	46.2	38.7	46.0	37.0		52.3	41.8	41.8	54.0	41.6	32.1
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	338.9	81.1	0.6	720.7	27.0		35.1	97.9	413.7	392.5	10.7	0.1
Delay (s)	393.4	127.3	39.3	766.7	64.0		87.4	139.6	455.5	446.5	52.3	32.2
Level of Service	F	F	D	F	E		F	F	F	F	D	C
Approach Delay (s)		174.5			500.9			264.4			143.6	
Approach LOS		F			F			F			F	

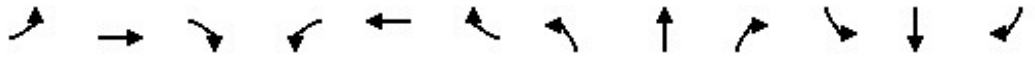
Intersection Summary			
HCM Average Control Delay	285.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.87		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	140.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
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		0.91	1.00		0.91	1.00				0.97		1.00
Frt		1.00	0.85		1.00	0.85				1.00		0.85
Flt Protected		1.00	1.00		1.00	1.00				0.95		1.00
Satd. Flow (prot)		5085	1583		5085	1583				3433		1583
Flt Permitted		1.00	1.00		1.00	1.00				0.95		1.00
Satd. Flow (perm)		5085	1583		5085	1583				3433		1583
Volume (vph)	0	667	394	0	709	1006	0	0	0	510	0	170
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	725	428	0	771	1093	0	0	0	554	0	185
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	88
Lane Group Flow (vph)	0	725	428	0	771	1093	0	0	0	554	0	97
Turn Type			Free			Free				custom		custom
Protected Phases		4			8							
Permitted Phases			Free			Free				6		6
Actuated Green, G (s)		61.9	90.0		61.9	90.0				19.1		19.1
Effective Green, g (s)		62.4	90.0		62.4	90.0				19.6		19.6
Actuated g/C Ratio		0.69	1.00		0.69	1.00				0.22		0.22
Clearance Time (s)		4.5			4.5					4.5		4.5
Vehicle Extension (s)		3.0			3.0					3.0		3.0
Lane Grp Cap (vph)		3526	1583		3526	1583				748		345
v/s Ratio Prot		0.14			0.15							
v/s Ratio Perm			0.27			c0.69				0.16		0.06
v/c Ratio		0.21	0.27		0.22	0.69				0.74		0.28
Uniform Delay, d1		4.9	0.0		5.0	0.0				32.8		29.3
Progression Factor		1.00	1.00		0.48	1.00				1.00		1.00
Incremental Delay, d2		0.1	0.4		0.1	1.2				4.0		0.4
Delay (s)		5.1	0.4		2.4	1.2				36.8		29.8
Level of Service		A	A		A	A				D		C
Approach Delay (s)		3.3			1.7			0.0			35.0	
Approach LOS		A			A			A			D	

Intersection Summary			
HCM Average Control Delay	8.8	HCM Level of Service	A
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	0.0
Intersection Capacity Utilization	34.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

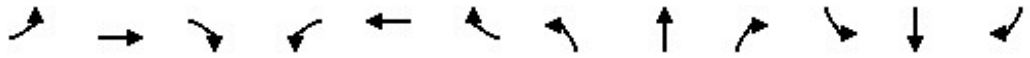
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0		4.0			
Lane Util. Factor		0.91			0.91	1.00	0.97		0.88			
Frt		1.00			1.00	0.85	1.00		0.85			
Flt Protected		1.00			1.00	1.00	0.95		1.00			
Satd. Flow (prot)		5085			5085	1583	3433		2787			
Flt Permitted		1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)		5085			5085	1583	3433		2787			
Volume (vph)	0	1177	0	0	1512	565	203	0	1474	0	0	0
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	1279	0	0	1643	614	221	0	1602	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	4	0	0	0
Lane Group Flow (vph)	0	1279	0	0	1643	614	221	0	1598	0	0	0
Turn Type						Free	custom		custom			
Protected Phases		4			8							
Permitted Phases						Free	2		2			
Actuated Green, G (s)		29.7			29.7	90.0	51.3		51.3			
Effective Green, g (s)		30.2			30.2	90.0	51.8		51.8			
Actuated g/C Ratio		0.34			0.34	1.00	0.58		0.58			
Clearance Time (s)		4.5			4.5		4.5		4.5			
Vehicle Extension (s)		3.0			3.0		3.0		3.0			
Lane Grp Cap (vph)		1706			1706	1583	1976		1604			
v/s Ratio Prot		0.25			c0.32							
v/s Ratio Perm						0.39	0.06		c0.57			
v/c Ratio		0.75			0.96	0.39	0.11		1.00			
Uniform Delay, d1		26.5			29.4	0.0	8.7		19.0			
Progression Factor		0.68			1.00	1.00	1.00		1.00			
Incremental Delay, d2		2.8			14.6	0.7	0.0		21.4			
Delay (s)		20.9			44.0	0.7	8.7		40.4			
Level of Service		C			D	A	A		D			
Approach Delay (s)		20.9			32.2			36.5			0.0	
Approach LOS		C			C			D			A	

Intersection Summary			
HCM Average Control Delay	31.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	81.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
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		0.91	1.00		0.91	1.00				0.97		0.88
Frt		1.00	0.85		1.00	0.85				1.00		0.85
Flt Protected		1.00	1.00		1.00	1.00				0.95		1.00
Satd. Flow (prot)		5085	1583		5085	1583				3433		2787
Flt Permitted		1.00	1.00		1.00	1.00				0.95		1.00
Satd. Flow (perm)		5085	1583		5085	1583				3433		2787
Volume (vph)	0	1672	1169	0	2150	1628	0	0	0	382	0	954
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	1817	1271	0	2337	1770	0	0	0	415	0	1037
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	2
Lane Group Flow (vph)	0	1817	1271	0	2337	1770	0	0	0	415	0	1035
Turn Type			Free			Free				custom		custom
Protected Phases		4			8							
Permitted Phases			Free			Free				6		6
Actuated Green, G (s)		45.4	90.0		45.4	90.0				35.6		35.6
Effective Green, g (s)		45.9	90.0		45.9	90.0				36.1		36.1
Actuated g/C Ratio		0.51	1.00		0.51	1.00				0.40		0.40
Clearance Time (s)		4.5			4.5					4.5		4.5
Vehicle Extension (s)		3.0			3.0					3.0		3.0
Lane Grp Cap (vph)		2593	1583		2593	1583				1377		1118
v/s Ratio Prot		0.36			0.46							
v/s Ratio Perm			0.80			c1.12				0.12		0.37
v/c Ratio		0.70	0.80		0.90	1.12				0.30		0.93
Uniform Delay, d1		16.8	0.0		20.0	45.0				18.4		25.7
Progression Factor		1.00	1.00		0.88	1.00				1.00		1.00
Incremental Delay, d2		1.6	4.4		2.5	57.4				0.1		12.7
Delay (s)		18.4	4.4		20.2	102.4				18.5		38.4
Level of Service		B	A		C	F				B		D
Approach Delay (s)		12.7			55.6			0.0			32.7	
Approach LOS		B			E			A			C	

Intersection Summary			
HCM Average Control Delay	36.4	HCM Level of Service	D
HCM Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	0.0
Intersection Capacity Utilization	81.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

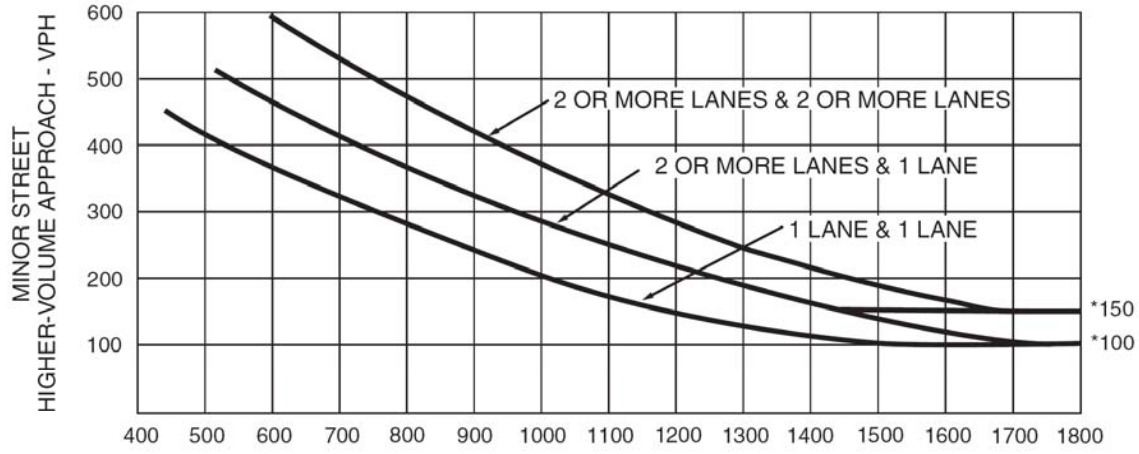


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	4.0		4.0			
Lane Util. Factor		0.91			0.91	1.00	0.94		0.76			
Frt		1.00			1.00	0.85	1.00		0.85			
Flt Protected		1.00			1.00	1.00	0.95		1.00			
Satd. Flow (prot)		5085			5085	1583	4990		3610			
Flt Permitted		1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)		5085			5085	1583	4990		3610			
Volume (vph)	0	1862	0	0	1692	409	2086	0	1611	0	0	0
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	2024	0	0	1839	445	2267	0	1751	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	1	0	0	0
Lane Group Flow (vph)	0	2024	0	0	1839	445	2267	0	1750	0	0	0
Turn Type						Free	custom		custom			
Protected Phases		4			8							
Permitted Phases						Free	2		2			
Actuated Green, G (s)		36.1			36.1	90.0	44.9		44.9			
Effective Green, g (s)		36.6			36.6	90.0	45.4		45.4			
Actuated g/C Ratio		0.41			0.41	1.00	0.50		0.50			
Clearance Time (s)		4.5			4.5		4.5		4.5			
Vehicle Extension (s)		3.0			3.0		3.0		3.0			
Lane Grp Cap (vph)		2068			2068	1583	2517		1821			
v/s Ratio Prot		c0.40			0.36							
v/s Ratio Perm						0.28	0.45		c0.48			
v/c Ratio		0.98			0.89	0.28	0.90		0.96			
Uniform Delay, d1		26.3			24.8	0.0	20.3		21.4			
Progression Factor		0.71			1.00	1.00	1.00		1.00			
Incremental Delay, d2		12.7			5.1	0.4	5.7		13.7			
Delay (s)		31.4			29.9	0.4	26.0		35.1			
Level of Service		C			C	A	C		D			
Approach Delay (s)		31.4			24.2			30.0			0.0	
Approach LOS		C			C			C			A	

Intersection Summary			
HCM Average Control Delay	28.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	82.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

ATTACHMENT 6
PEAK HOUR TRAFFIC SIGNAL WARRANTS

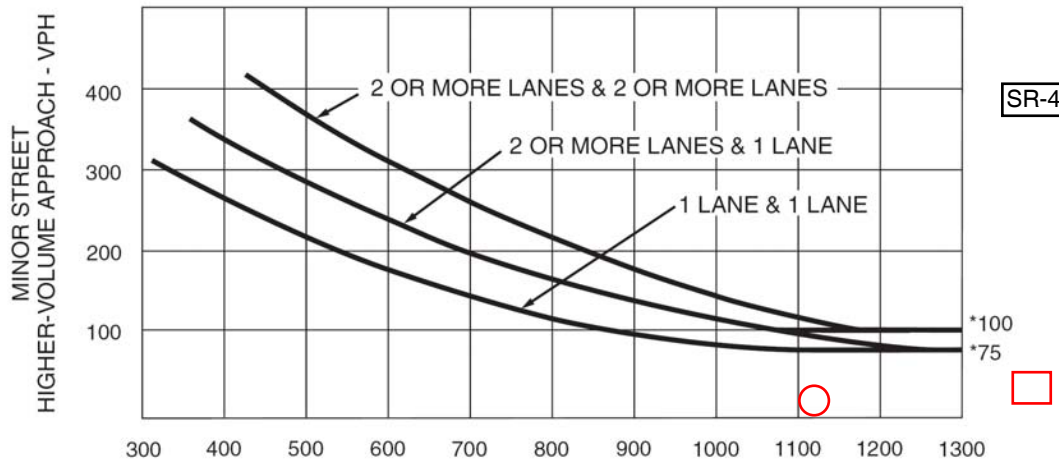
Figure 4C-3. Warrant 3, Peak Hour



*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 approach with one lane.

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

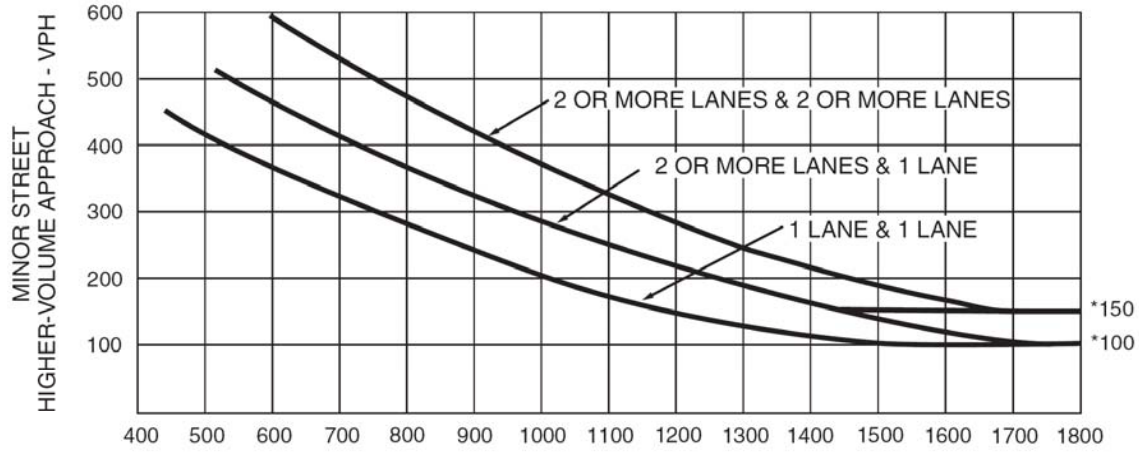
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE ~~70~~ 64 km/h OR ABOVE 40 mph ON MAJOR STREET)



SR-41 and Avenue 15

*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

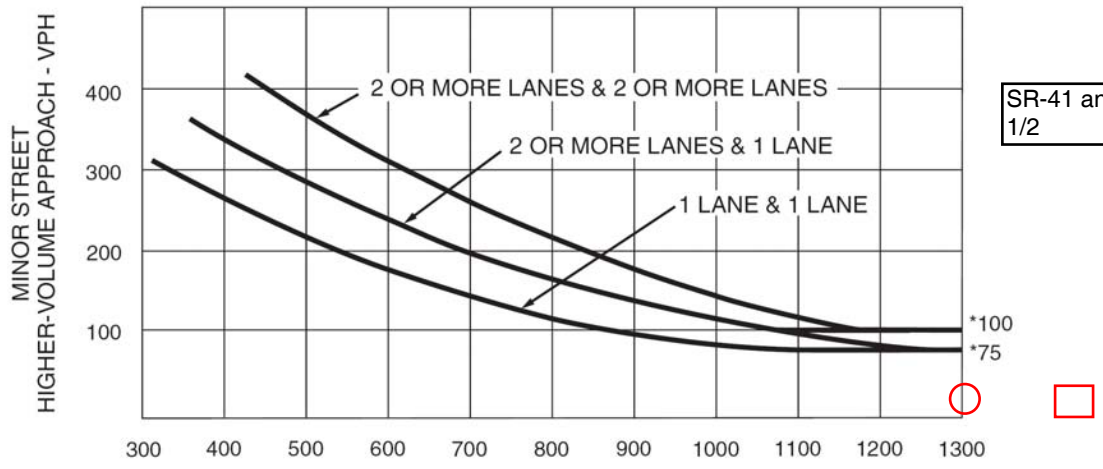
Figure 4C-3. Warrant 3, Peak Hour



*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 approach with one lane.

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE ~~70~~ 64 km/h OR ABOVE 40 mph ON MAJOR STREET)



SR-41 and Avenue 14 1/2

*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

ATTACHMENT 7
MITIGATED INTERSECTION ANALYSES

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	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	1.00	1.00	1.00	1.00	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	1770	1863	3539	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	1770	1863	3539	1583
Volume (vph)	25	191	197	679	1235	35
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	27	208	214	738	1342	38
RTOR Reduction (vph)	0	182	0	0	0	19
Lane Group Flow (vph)	27	26	214	738	1342	19
Turn Type		Perm	Prot			Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Actuated Green, G (s)	7.4	7.4	11.8	47.5	31.7	31.7
Effective Green, g (s)	7.9	7.9	11.8	48.5	32.7	32.7
Actuated g/C Ratio	0.12	0.12	0.18	0.75	0.51	0.51
Clearance Time (s)	4.5	4.5	4.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	217	194	324	1403	1797	804
v/s Ratio Prot	0.02		c0.12	0.40	c0.38	
v/s Ratio Perm		c0.02				0.01
v/c Ratio	0.12	0.13	0.66	0.53	0.75	0.02
Uniform Delay, d1	25.2	25.2	24.4	3.3	12.6	7.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.3	5.0	0.4	1.7	0.0
Delay (s)	25.4	25.5	29.4	3.6	14.3	7.9
Level of Service	C	C	C	A	B	A
Approach Delay (s)	25.5			9.4	14.1	
Approach LOS	C			A	B	

Intersection Summary			
HCM Average Control Delay	13.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	64.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	58.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	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	1.00	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	1770	3539	3539	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	1770	3539	3539	1583
Volume (vph)	65	281	273	1351	975	61
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	71	305	297	1468	1060	66
RTOR Reduction (vph)	0	219	0	0	0	38
Lane Group Flow (vph)	71	86	297	1468	1060	28
Turn Type		Perm	Prot			Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Actuated Green, G (s)	8.7	8.7	8.2	32.8	20.6	20.6
Effective Green, g (s)	9.2	9.2	8.2	33.8	21.6	21.6
Actuated g/C Ratio	0.18	0.18	0.16	0.66	0.42	0.42
Clearance Time (s)	4.5	4.5	4.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	319	286	285	2345	1499	670
v/s Ratio Prot	0.04		c0.17	0.41	c0.30	
v/s Ratio Perm		c0.05				0.02
v/c Ratio	0.22	0.30	1.04	0.63	0.71	0.04
Uniform Delay, d1	17.8	18.1	21.4	5.0	12.1	8.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.6	64.7	0.5	1.5	0.0
Delay (s)	18.2	18.7	86.1	5.5	13.6	8.7
Level of Service	B	B	F	A	B	A
Approach Delay (s)	18.6			19.1	13.4	
Approach LOS	B			B	B	

Intersection Summary			
HCM Average Control Delay	17.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	51.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	55.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			