

APPENDIX A

Traffic Impact Analysis

DRAFT REPORT

**Metro Union Division Bus Maintenance
and Operations Facility
Traffic Impact Analysis**

Prepared for

**Los Angeles County Metropolitan
Transportation Authority
(Metro)**

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INTRODUCTION

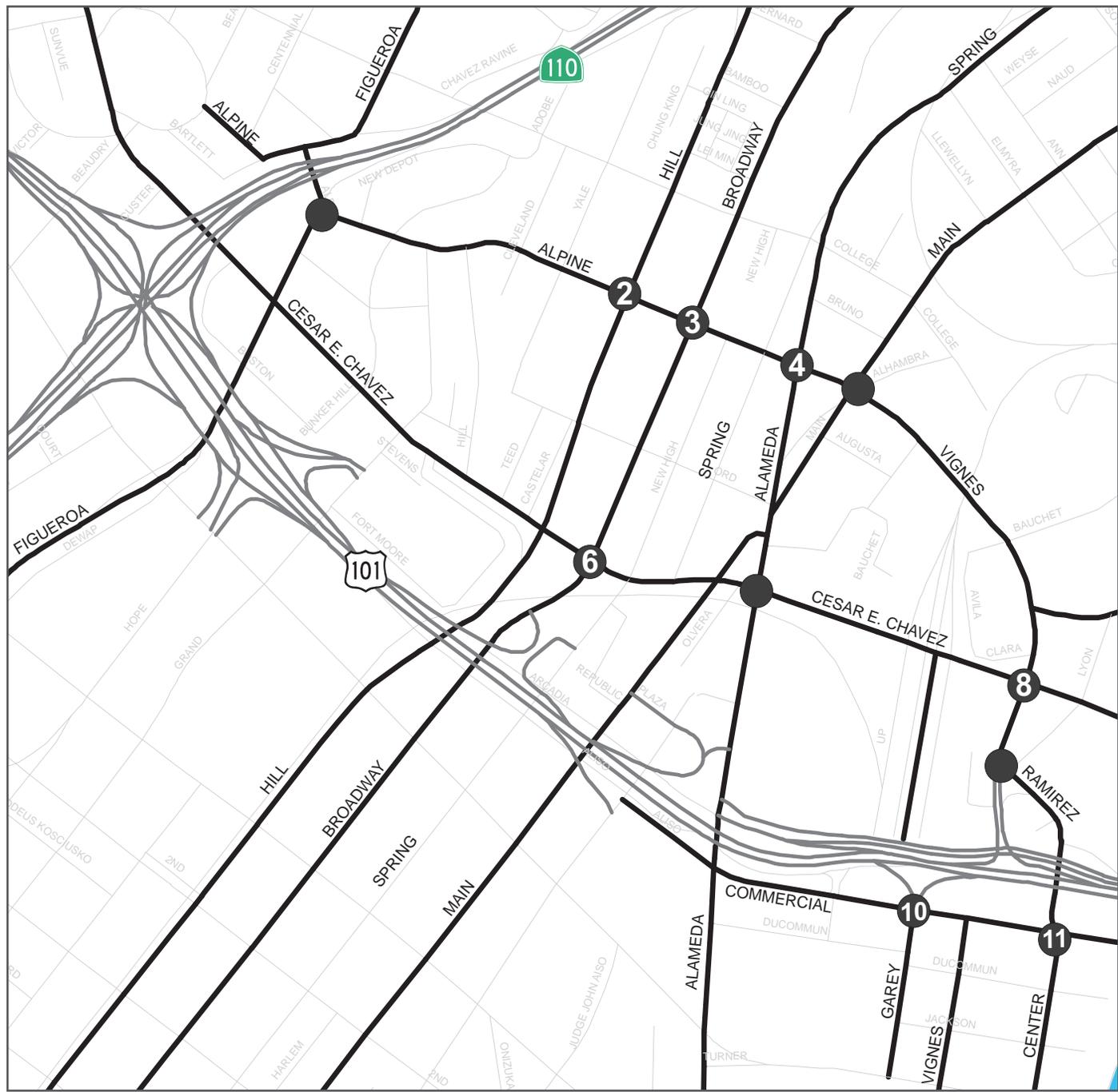
This report summarizes the results of a traffic impact study that was undertaken for the proposed Los Angeles County Metropolitan Transportation Authority (Metro) Union Division Bus Maintenance Facility located in the City of Los Angeles. The report summarizes the methodology, findings and conclusions of the traffic impact analysis. A total of eleven (11) key intersections in the vicinity of the project site were analyzed. The traffic study assesses the effects of the additional trips expected to be generated by the construction of the proposed maintenance facility. The traffic impact analysis also takes into account other traffic growth due to specific development projects in the surrounding area and overall ambient growth in background traffic.

Project Description

The project site is located at 920 North Vignes Street in the northeast corner of the Vignes Street and Cesar Chavez Avenue intersection, as shown in **Figure 1**. The site consists of approximately six acres and the maintenance facility would replace the former Terminal 31 site and the employee parking lot at Metro's Regional Rebuild Center (RRC) and the expansion of RRC Building 1. The segment of Lyon Street located north of Cesar Chavez would also be vacated as a part of the project. The new facility would include a two-story bus maintenance facility, consisting of approximately 360,000 square feet including some office space, and a three-story parking structure. The facility would provide service for approximately 125 standard buses and 50 articulated buses or 200 standards buses. For purposes of traffic impact analysis, it was assumed that the facility would accommodate 200 standard buses.

The proposed three-story parking structure would be constructed on the western portion of the project site along Vignes Street and Cesar Chavez Avenue. The ground and second floors of the parking structure would accommodate bus maintenance, layover and parking activities with a large portion of the third floor reserved for employee parking. A 20,000 square-foot Central Cash Counting Facility (CCCF) would also be located within the structure, either on the first or third floor. This facility will have 34 employees who work a 6-day week from 6:00AM to 3:00PM. An unmanned, two-pump compressed natural gas (CNG) fueling station would also be located on the project site. This facility would be located in the vicinity of the existing Caesar Chavez Avenue and Lyon Street intersection. It would be accessible to the general public and have its own ingress/egress separate from the proposed parking structure.

Employee access into the structure would be provided using a circular ramp to bring vehicles up to the third floor of the parking structure. A proposed pedestrian and vehicle bridge would connect the spiral ramp on the south side of Cesar Chavez Avenue to the third floor of the proposed parking structure on the north side of the street. A bridge across Cesar Chavez Avenue would connect the circular ramp to the parking structure. Bus access would be provided at an existing entrance to the former Terminal 31 site via a T-intersection located approximately 350 feet north of Cesar Chavez Avenue along Vignes Street. A potential secondary exit has been identified as a right-in/right-out only facility located along Cesar Chavez Avenue where the existing Lyon Street intersection currently exists. A conceptual site plan is provided in **Figure 2**.



Legend

Study Intersection

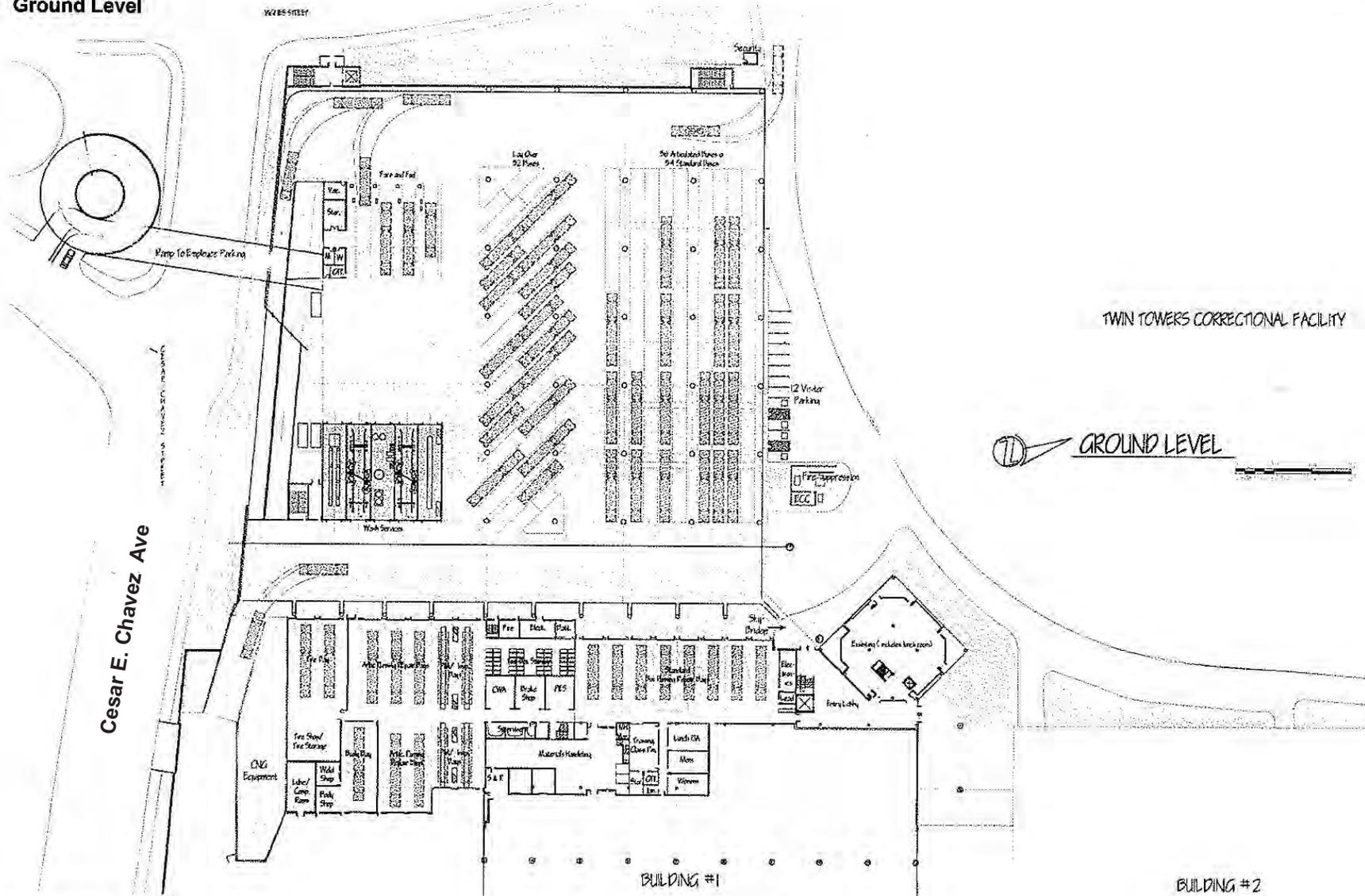


Metro Union Division Bus Maintenance Facility
City of Los Angeles

FIGURE 1
Project Study Area

Exhibit 4.C
Ground Level

Vignes St



Cesar E. Chavez Ave

TWIN TOWERS CORRECTIONAL FACILITY

GROUND LEVEL

BUILDING #1

BUILDING #2



In conjunction with the City of Los Angeles Department of Transportation (LADOT) staff, a total of eleven (11) intersections were identified and are analyzed in the traffic study for the morning and evening peak hour conditions. The locations of the eleven study intersections assessed in the traffic analysis are:

1. Alpine Street at Figueroa Street;
2. Alpine Street at Hill Street;
3. Alpine Street at Broadway;
4. Vignes Street at Alameda Street;
5. Vignes Street at Main Street;
6. Cesar Chavez Avenue at Broadway;
7. Cesar Chavez Avenue at Alameda Street;
8. Cesar Chavez Avenue at Vignes Street;
9. Vignes Street at Ramirez Street;
10. US-101 SB Ramps at Commercial Street; and
11. Center Street at Commercial Street.

Of the eleven study intersections, ten are controlled by traffic signals. The intersection of Center Street at Commercial Street is four-way stop sign controlled.

Along with identifying the analyzed intersections to be included in the traffic impact study, other methodology assumptions and parameters were summarized and approved by LADOT in a Memorandum of Understanding (MOU). The approved MOU is included in **Appendix A**. The MOU process is standard for traffic impact studies conducted in the City.

EXISTING CONDITIONS

A field inventory was conducted of all study intersection locations. The inventory included review of intersection geometric layout, traffic control, lane configuration, posted speed limits, transit service, land use and parking. This information is required for the subsequent traffic impact analysis. **Figure 4** illustrates the existing intersection geometry (lane configurations) for the eleven analyzed intersections.

New morning and evening peak period traffic counts were conducted for the eleven analyzed intersections in August 2007. The existing morning and evening peak hour traffic volumes are illustrated in **Figure 3**. The traffic count data sheets are provided in **Appendix B**.

Existing Roadway Conditions

Regional access to the project site is provided by the Golden State Freeway (I-5), San Bernardino Freeway (I-10), Santa Ana Freeway (US-101) and Pasadena Freeway (SR-110). Interstate 5 is located approximately one mile northeast of the project site and State Route 110 is located approximately three-quarter miles northwest of the project. The closest freeway ramps with I-5 occur at Mission Road and Marengo Street. Freeway ramps accessing SR-110 are located at Hill Street and Figueroa Street. These two freeways provide north-south regional access to the site.

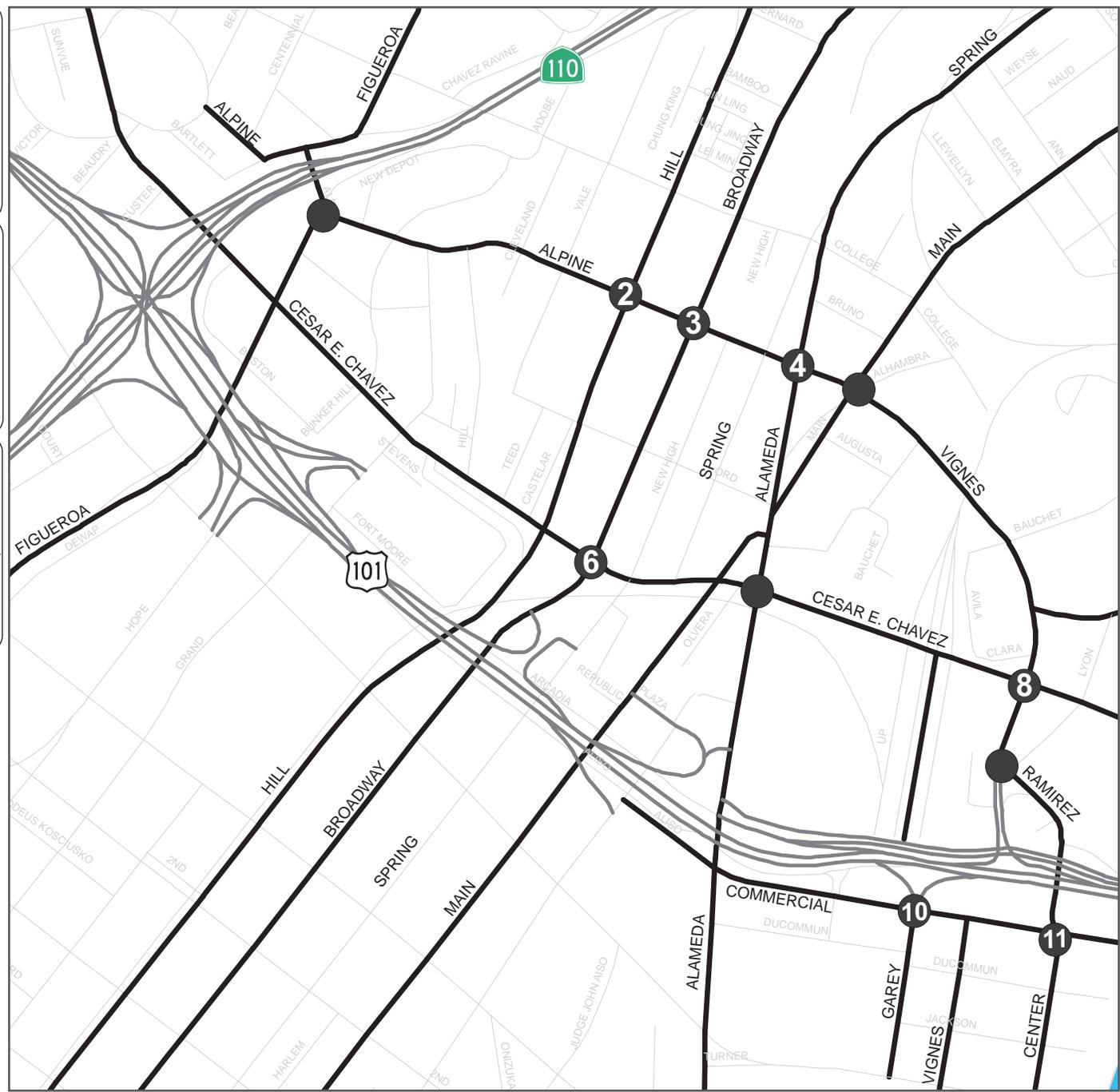
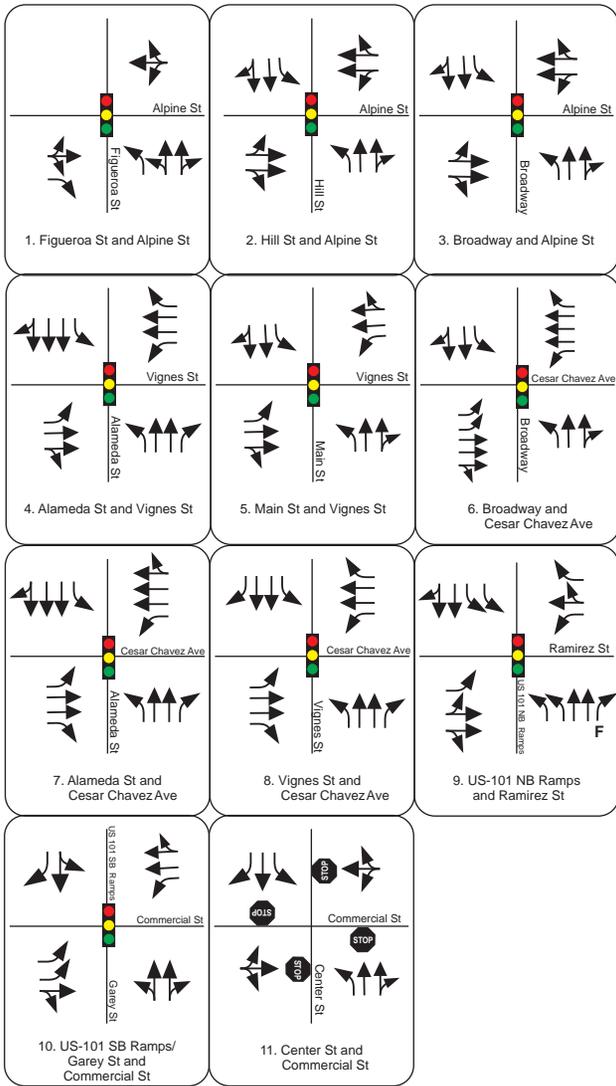
East-west regional access to the site is provided by US-101, approximately one-quarter mile to the south, and the I-10 Freeway, approximately one mile to the east. Freeway ramps with US-101 that are located in the study area are provided at the southern terminus of Vignes Street for westbound traffic and Vignes Street and Commercial Street for eastbound traffic. The I-10 freeway can be accessed using ramps located along Cesar Chavez Avenue.

There are also local roadways which provide access to the project site. The following provides a brief description of these roadways within the study area.

Alpine Street is an east-west street that extends from Figueroa Street to and North Main Street. It is classified as a collector street along the segment between Figueroa Street and Hill Street. This segment varies in width from one to two travel lanes in each direction. From Hill Street to North Main Street, Alpine Street is classified as a secondary highway and consists of one travel lane and one parking lane in each direction. Metered on-street parking is restricted during peak hours. The land uses along this roadway are primarily residential with neighborhood-serving commercial uses west of Hill Street with additional commercial and office uses between Hill Street and North Main Street.

Alameda Street is a Major Class II highway that begins at College Street and continues southward through the City of Los Angeles into the South Bay area. Between College Street and North Main Street, this roadway consists of one travel lane and one parking lane in each direction. From Main Street to Commercial Street, it widens to include three travel lanes in each direction. Exclusive left-turn pockets are provided at all intersections. On-street parking is restricted during peak hours between College Street and North Main Street and is prohibited all day from North Main Street to Commercial Street. The land uses along this facility consist of industrial and commercial north of Main Street and office, Caltrans right-of-way and open space from Main Street to Commercial Street.

Broadway is primarily classified as a secondary highway as it travels north-south through the study area with only the segment between Alpine Street and Cesar Chavez Avenue having a classification of Major Class II highway. Throughout the study area, this roadway consists of two travel lanes in each direction and exclusive left-turn lanes are provided at all intersections. On-street parking is allowed in mid-block areas



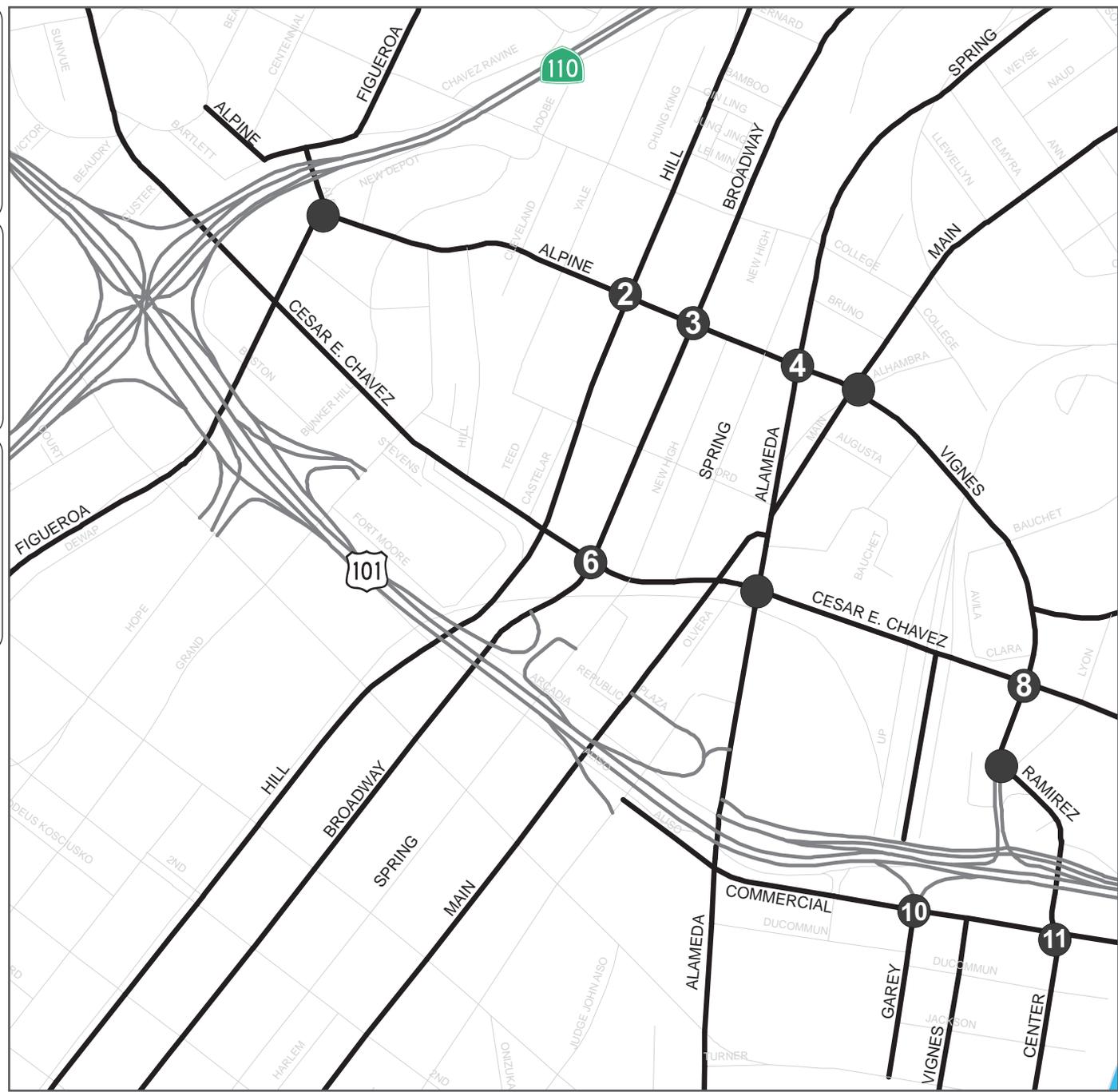
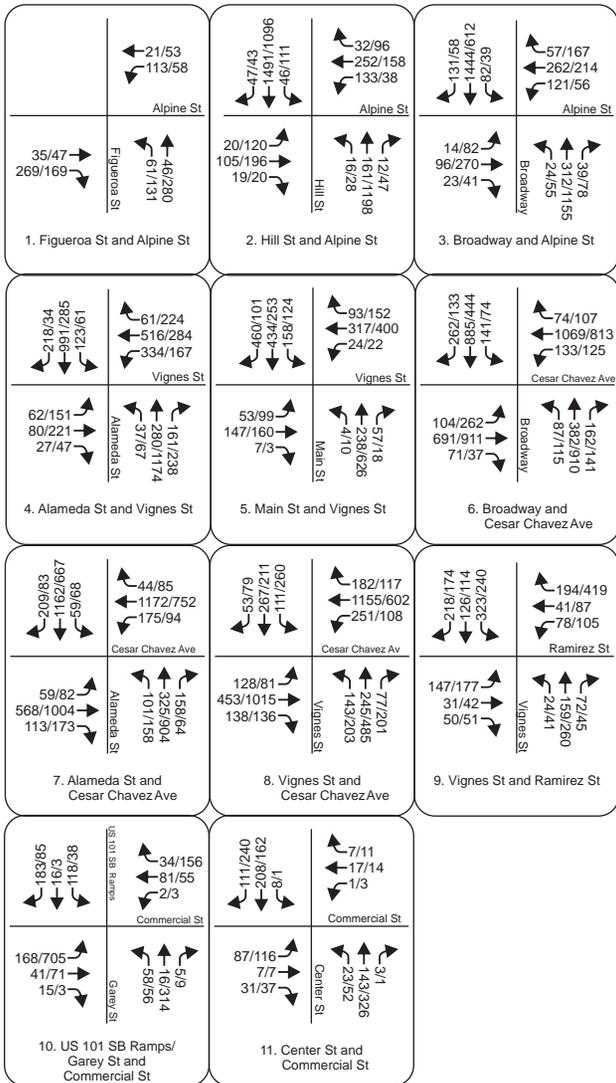
Legend

- #** Study Intersection
- STOP** Stop Sign
- Traffic Signal
- F** Free Right Turn



Metro Union Division Bus Maintenance Facility
City of Los Angeles

FIGURE 3
Study Intersection Lane Configurations



Legend

Study Intersection

XX(X) AM(PM)



Metro Union Division Bus Maintenance Facility
City of Los Angeles

FIGURE 4
Existing AM and PM Peak Hour Traffic Volumes

with the exception of the section between Cesar Chavez Avenue and Aliso Street. Land uses located along this roadway are generally office and commercial with large sections utilized for off-street parking.

Cesar Chavez Avenue is a Major Class II highway that parallels the Santa Ana Freeway as it passes through downtown Los Angeles. This roadway consists of two travel lanes and one parking lane in each direction from Figueroa Street to Broadway where the eastbound direction narrows to two travel lanes until just east of Alameda Street. From Alameda Street, the roadway generally consists of two travel lanes in each direction. On-street parking is restricted during peak hours from Figueroa Street to Broadway and all day from Broadway through the remainder of the study area. The land uses located along this facility consist of residential west of Alameda Street and office and industrial to the east.

Center Street is a Major Class II highway that begins at Ramirez Street north of the Santa Ana Freeway and extends southward before becoming Santa Fe Avenue. This roadway consists of two southbound travel lanes from Ramirez Street to Commercial Street where it narrows to one travel lane. There is only one travel lane in the northbound direction along this entire section. No on-street parking is allowed until south of Commercial Street. The land uses along this roadway are generally industrial with some office.

Commercial Street is classified as a collector street and consists of two travel lanes from Alameda Street to the southbound ramps for the Santa Ana Freeway. Continuing east, it narrows to one travel lane each direction until its terminus just east of Center Street. On-street parking is prohibited along this entire roadway. The land uses along this facility are industrial in nature.

Figueroa Street is a Major Class II highway that extends south from the Pasadena Freeway through the City of Los Angeles until its terminus in the South Bay region. This roadway consists of two travel lanes in each direction with on-street parking allowed along both sides. Exclusive left-turn lanes are provided at all intersections. The land uses along this facility are generally residential with some commercial.

Hill Street is classified as a secondary highway and extends southward from the Pasadena Freeway through downtown Los Angeles. Throughout the study area, this roadway consists of two travel lanes in each direction with exclusive left-turn lanes provided at all intersections. On-street parking is allowed in mid-block areas. Land uses located along this roadway are generally office and commercial with large sections utilized for off-street parking.

Main Street is classified as a secondary highway and extends south through downtown Los Angeles. North of Alameda Street, this roadway consists of two travel lanes in each direction. South of Alameda Street, this facility becomes a one-way street with three travel lanes in the northbound direction. On-street parking is allowed along both sides of the street. Land uses north of Alameda Street are industrial and a mixture of commercial and office to the south.

Ramirez Street is a Major Class II highway that extends between Vignes Street and Center Street. This facility consists of two travel lanes in each direction with exclusive left-turn lanes at all intersections. On-street parking is not allowed along this roadway and the land uses are generally office in nature.

Existing Transit Service

Due to the proposed project's proximity to downtown Los Angeles, there are a significant number of transit lines that travel through the study area. The following is a listing of the transit operators and the number of routes they each provide to locations within the study area:

Metro currently provides the following service into the study area: 22 local routes, six limited-stop routes, 11 downtown express routes, four Metro Rapid routes and one Metro Transitway route. In addition, Metro also offers service provided by the Metro Red, Purple and Gold Rail lines. The Chinatown station along the Metro Gold Line is located approximately one-half mile north of the proposed project.

The following transit operators also provide bus service through the study area:

- Antelope Valley Transit Authority – 1 route
- Commuter Express – 4 routes
- Foothill Transit – 6 routes and the Silver Streak
- LADOT Dash – 3 routes
- Santa Clarita Transit – 2 routes
- Santa Monica Big Blue Bus – 1 route

Los Angeles Union Station is located approximately one-quarter of a mile from the proposed project. The following commuter and passenger rail operators also provide services into the study area:

- Metrolink – 5 commuter rail lines
- Amtrak – 1 inter-regional line

Traffic Operations Analysis Methodology

Traffic operating conditions in the vicinity of the project were analyzed using intersection capacity-based methodology known as the Circular 212 “Critical Movement Analysis” (CMA) method for the signalized locations. At the stop-controlled intersection, the Highway Capacity Manual (HCM) methodology for unsignalized locations was utilized to calculate the average delay and corresponding level of service.

The efficiency of traffic operations at a location is measured in terms of Level of Service (LOS). Level of service is a description of traffic performance at intersections. The level of service concept is a measure of average operating conditions at intersections during an hour. It is based on a volume-to-capacity (V/C) ratio for signalized locations and delay (in seconds) for stop-controlled intersections. Levels range from A to F with A representing excellent (free-flow) conditions and F representing extreme congestion. The CMA methodology compares the amount of traffic an intersection is able to process (the capacity) to the level of traffic during the peak hours (volume). A volume-to-capacity (V/C) ratio is calculated to determine the LOS. The HCM method for stop-controlled intersections calculates the average delay, in seconds, per vehicle for each approach and for the intersection as a whole. The delay for the intersection corresponds to a LOS value which describes the intersection operations. Intersections with vehicular volumes that are at or near capacity experience greater congestion and longer vehicle delays. **Table 1** describes the LOS concept and the operating conditions for signalized and stop-controlled intersections.

TABLE 1: INTERSECTION LEVEL OF SERVICE DEFINITIONS

LOS	Interpretation	Signalized Intersection Volume to Capacity Ratio	Stop-Controlled Intersection Average Stop Delay (HCM)
A	Excellent operation. All approaches to the intersection appear quite open, turning movements are easily made, and nearly all drivers find freedom of operation.	0.000 – 0.600	≤ 10 seconds
B	Very good operation. Many drivers begin to feel somewhat restricted within platoons of vehicles. This represents stable flow. An approach to an intersection may occasionally be fully utilized and traffic queues start to form.	0.601 – 0.700	> 10 and ≤ 15 seconds
C	Good operation. Occasionally backups may develop behind turning vehicles. Most drivers feel somewhat restricted.	0.701 – 0.800	> 15 and ≤ 25 seconds
D	Fair operation. There are no long-standing traffic queues. This level is typically associated with design practice for peak periods.	0.801 – 0.900	> 25 and ≤ 35 seconds
E	Poor operation. Some long-standing vehicle queues develop on critical approaches.	0.901 – 1.000	> 35 and ≤ 50 seconds
F	Forced flow. Represents jammed conditions. Backups from locations downstream or on the cross street may restrict or prevent movements of vehicles out of the intersection approach lanes; therefore, volumes carried are not predictable. Potential for stop and go type traffic flow.	Over 1.000	> 50 seconds

Source: Highway Capacity Manual, Special Report 209, Transportation Research Board, Washington D.C., 2000.

Existing Traffic Operations Analysis

The morning and evening peak hour levels of service analysis were conducted for the eleven study intersections based on the measured traffic volumes and the methodologies described previously. All intersection analyses are performed using the TRAFFIX (Traffic Impact Analysis) software program. The existing conditions LOS analysis results are summarized in **Table 2**.

Level of service D is generally considered to be the lowest acceptable LOS in an urban or suburban area. Level of service E and F are considered to be unacceptable operating conditions which warrant mitigation. The results shown in **Table 2** indicate that all of the eleven of the analyzed intersections are currently operating at LOS D or better during both the morning and evening peak hours. The detailed LOS worksheets are included in **Appendix C**.

TABLE 2: LOS ANALYSIS - EXISTING CONDITIONS

Intersection		Existing Conditions			
		AM Peak Hour		PM Peak Hour	
		LOS	V/C (Delay)	LOS	V/C (Delay)
1	Alpine Street at Figueroa Street	A	0.237	A	0.272
2	Alpine Street at Hill Street	B	0.676	C	0.701
3	Alpine Street at Broadway	C	0.734	C	0.727
4	Alpine Street at Alameda Street	A	0.581	C	0.756
5	Vignes Street at Main Street	A	0.507	B	0.606
6	Cesar Chavez Avenue at Broadway	C	0.781	C	0.797
7	Cesar Chavez Avenue at Alameda Street	C	0.740	D	0.854
8	Cesar Chavez Street at Vignes Street	C	0.714	D	0.856
9	Vignes Street at Ramirez Street	A	0.338	A	0.485
10	US-101 SB Ramps at Commercial Street	A	0.274	B	0.604
11	Commercial Street at Center Street*	A	9.2	B	11.5

* This intersection is unsignalized and the LOS result is shown in seconds of delay rather than V/C.

FUTURE WITHOUT PROJECT CONDITIONS

To evaluate the potential impact of the proposed project on local traffic conditions, it is first necessary to develop a forecast of future traffic volumes in the study area under conditions without the proposed project. This provides a basis against which to measure the potential significant impacts of the proposed project.

The anticipated buildout year of the proposed project is expected to be 2009. That is, the proposed maintenance facility is expected to be constructed and operating by the year 2009. The projection of Future No-Project (future without project) traffic consists of existing traffic plus ambient traffic growth (general background regional growth), plus growth in traffic generated by specific cumulative projects expected to be completed by the year 2009. The following describes the two growth components.

Ambient Traffic Growth

Ambient traffic growth is the increase in traffic that will occur in the study area due to general employment growth, housing growth and growth in regional through trips in southern California. Even if there were no change in housing or employment in the City of Los Angeles, there would be some background (ambient) traffic growth in the region. Per the LADOT, a one percent per year growth rate was assumed as a conservative estimate of traffic increase in the study area. Therefore, the 2007 existing traffic volumes were increased by a factor of 1.02 to account for ambient traffic growth to the year 2009.

Cumulative Project Growth

Cumulative project traffic growth which is growth due to specific, known development projects in the study area is also included in the analysis of the future without project conditions. Based on information obtained from the City of Los Angeles, a total of 34 related projects were identified which may affect traffic circulation within the study area. **Table 3** summarizes the location, type and number of AM and PM peak hour trips generated for the related projects. **Figure 5** shows the general locations of the related projects.

Traffic generated due to these projects has been estimated based on information from the LADOT and supplemented with standard trip generation data from the Institute of Transportation Engineers' (ITE) *Trip Generation, 7th Edition*. The estimated trip generation for each of the 34 cumulative projects is summarized in **Table 3**. As shown, the cumulative projects are forecast to generate a total of approximately 5,541 trips during the morning AM peak hour and 7,305 during PM peak hour. These trips were then assigned to the traffic model as part of the development of the future conditions without project traffic projections. The morning and evening peak hour traffic volumes associated with these related projects are shown on **Figure 6**.

Future Without Project Traffic Analysis

The proposed Union Division Bus Maintenance Facility is anticipated to be complete and operating by 2009, therefore future conditions without the project were assessed for this year. The no-project traffic projections were developed and operating conditions were analyzed at the eleven study intersections for the morning and evening peak hours. The operating conditions for Year 2009 take into account the addition of the background ambient growth and traffic related to the cumulative related projects.

TABLE 3: RELATED PROJECTS TRIP GENERATION ESTIMATES

No.	Location	Project Type	Net AM Peak	Net PM Peak	Net Daily
1	1720 Cesar Chavez Ave	Med. Off.	196	291	2,876
2	550 Figueroa St	Mixed Use	112	258	1,462
3	257 Spring St	Mixed Use	41	94	66
4	1030 Mignonette St	Mixed Use	132	216	2,350
5	900 N. Broadway	Mixed Use	162	184	2,823
6	701 E. 3 rd St	Bar/Lounge	0	66	789
7	500 N. Bunker Hill Ave	Supermarket	60	189	1,924
8	211 W. Temple St	Government	152	146	1,052
9	250 S. Hill St	Mixed Use	158	265	2,595
10	110 N. Beaudry Ave	Mixed Use	98	142	1,540
11	Temple St at Los Angeles St	Government	373	394	3,600
12	Temple St at Vignes St	Government	0	0	0
13	1201 W Miramar St	School	383	0	0
14	200 S. Los Angeles St	Mixed use	276	365	4,688
15	1101 W. Main St	Residential	71	87	1,102
16	1201 W. Miramar St	School	130	0	0
17	2111 E. 1 st St	Government	7	0	4
18	1 st St at Main St	Government	214	345	3,340
19	2 nd St at Main St	Government	0	0	0
20	1 st St at Judge John Aiso St	Government	0	0	0
21	Cesar Chavez Ave at Broadway	Mixed Use	152	247	2,665
22	2051 E. 7 th St	Mixed Use	29	20	242
23	101 E. 6 th St	Mixed Use	24	137	1,541
24	6 th St at Main St	Mixed Use	22	117	1,429
25	221 S. Los Angeles St	Residential	224	126	1,910
26	454 E. Commercial St	Government	30	10	0
27	327 N. Fremont Ave	Mixed Use	212	355	3,568
28	1855 N. Main St	School	280	115	1,115
29	102 S. Grand Ave	Mixed Use	1,326	2,270	0
30	720 W. Cesar Chavez Ave	Mixed Use	112	147	1,639
31	855 N. Figueroa Terr	Residential	45	53	598
32	300 S. Santa Fe Ave	Mixed Use	208	229	2,443
33	501 S. Olive St	Mixed Use	296	437	5,109
34	490/496 Bauchet St	Government	16	0	98
Total			5,541	7,305	53,838

Legend

Study Intersection

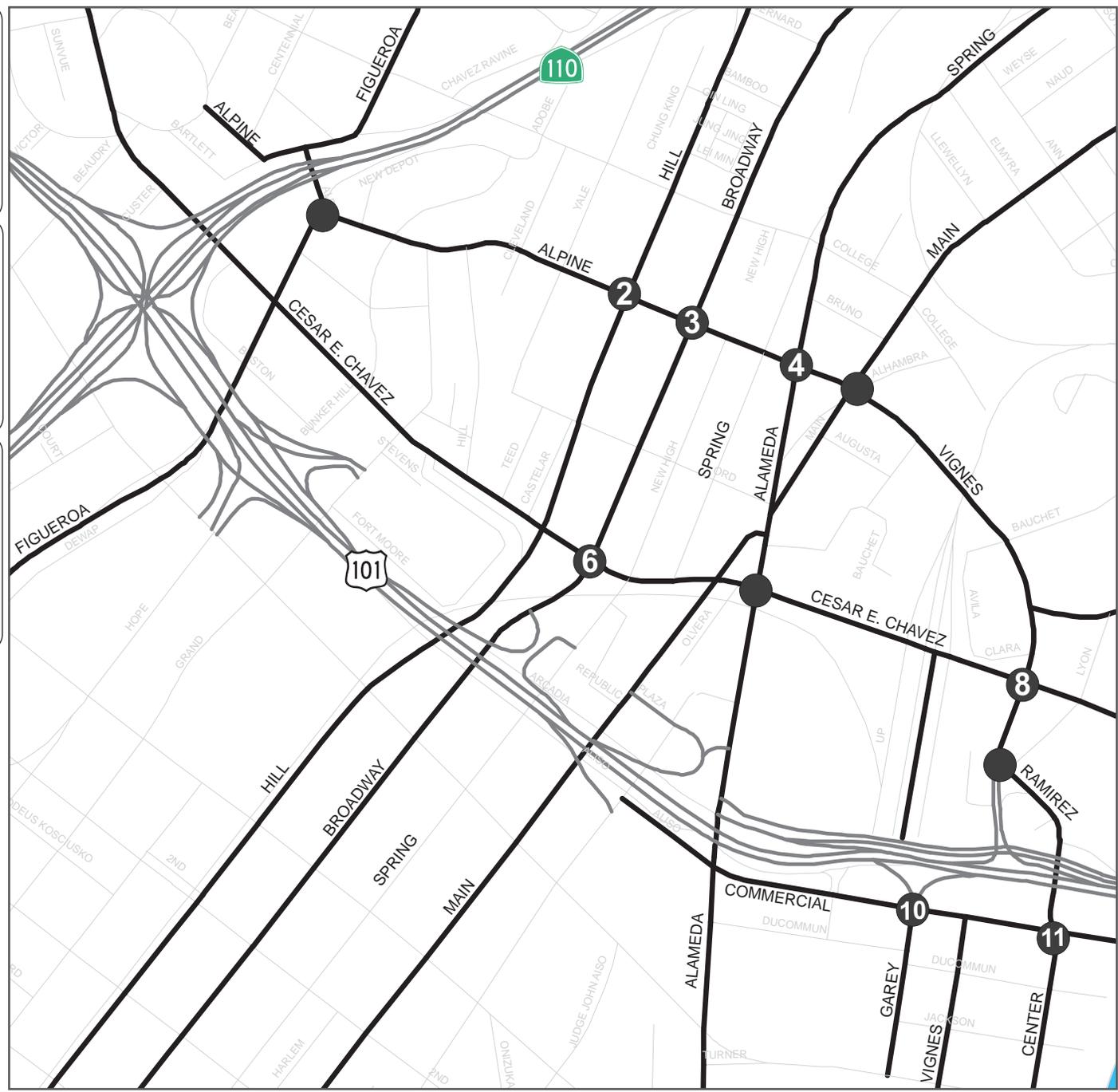
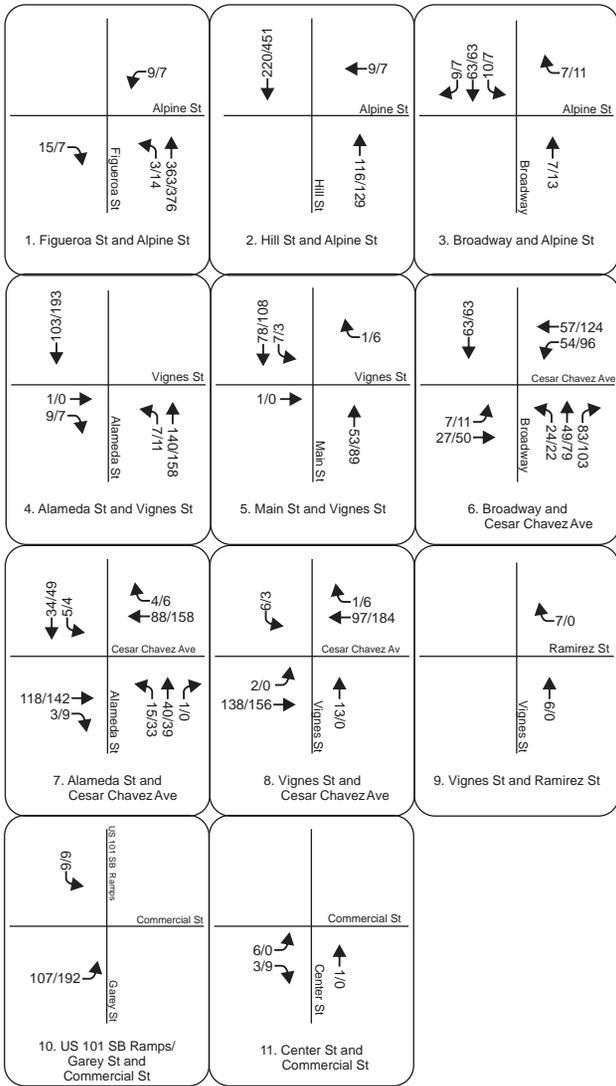


NOT TO SCALE



Metro Union Division Bus Maintenance Facility
City of Los Angeles

FIGURE 5
Related Project Locations



Legend

Study Intersection



**Metro Union Division Bus Maintenance Facility
City of Los Angeles**

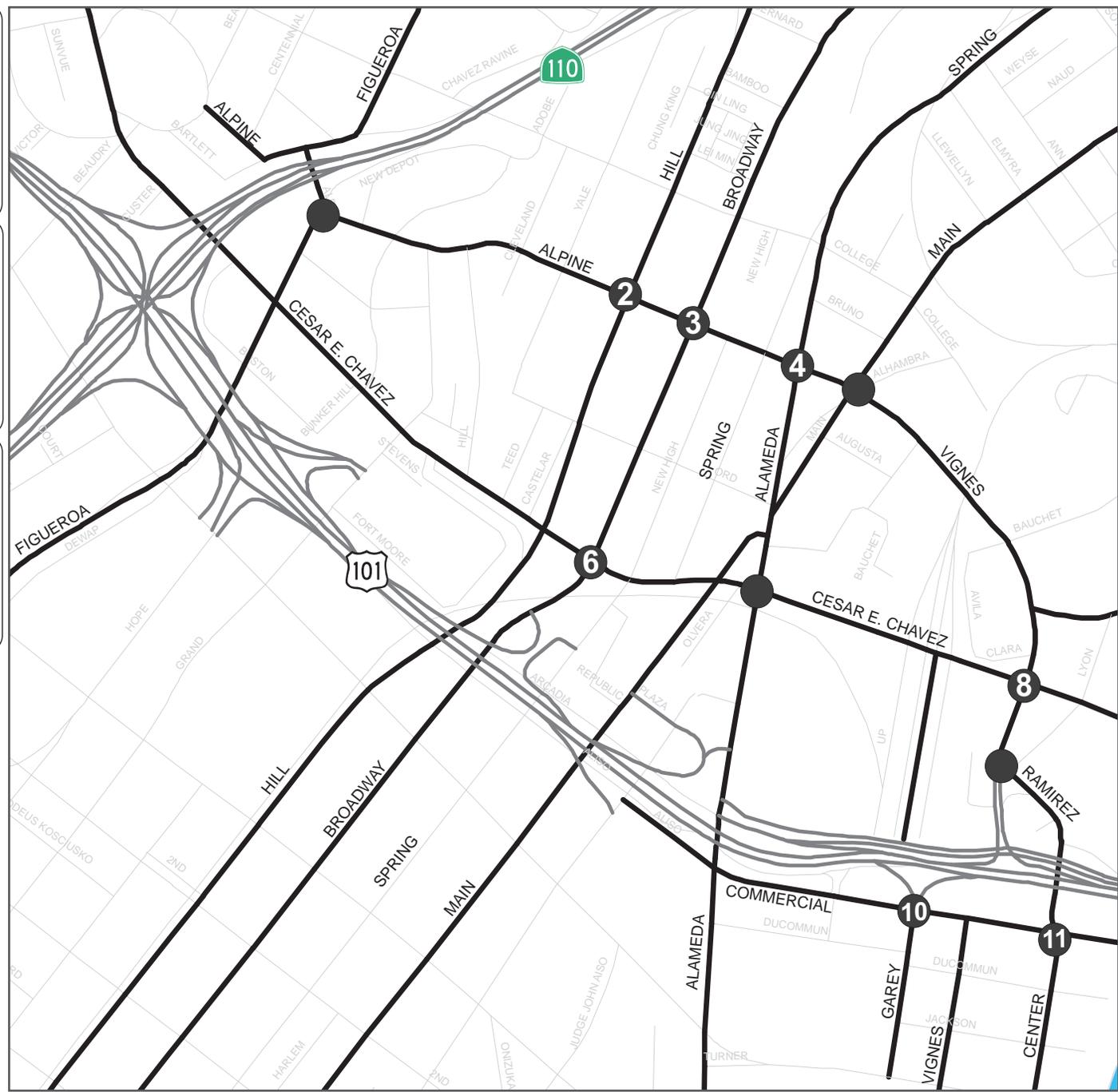
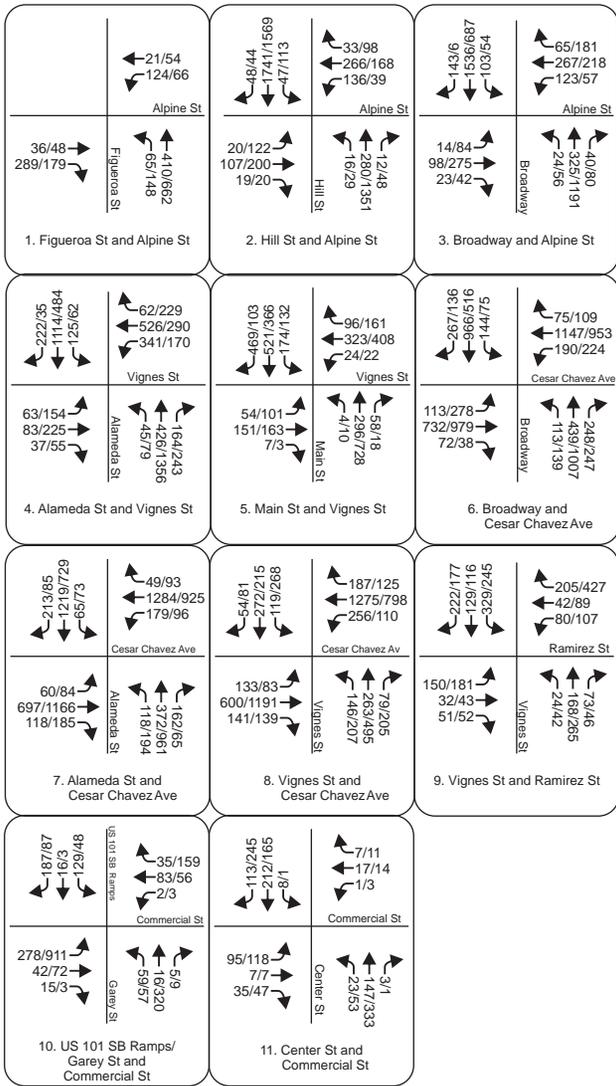
**FIGURE 6
Related Project Trip Assignment**

Based on the 2009 without project traffic forecast, the LOS at the analyzed intersections was calculated for the morning and evening peak hours and summarized in **Table 4**. As shown in **Table 4**, all eleven study intersections are projected to operate at LOS D or better during the morning peak hour under future conditions without the project and ten of the eleven during the evening peak hour. The Cesar Chavez Avenue at Broadway intersection is expected to operate at LOS E under Future No Project conditions. The detailed LOS worksheets are included in **Appendix C**.

TABLE 4: LOS ANALYSIS – FUTURE WITHOUT PROJECT CONDITONS

Intersection		Future No Project Conditions			
		AM Peak Hour		PM Peak Hour	
		LOS	V/C (Delay)	LOS	V/C (Delay)
1	Alpine Street at Figueroa Street	A	0.370	A	0.402
2	Alpine Street at Hill Street	C	0.765	C	0.740
3	Alpine Street at Broadway	C	0.775	C	0.723
4	Alpine Street at Alameda Street	B	0.625	C	0.788
5	Vignes Street at Main Street	A	0.535	B	0.625
6	Cesar Chavez Avenue at Broadway	D	0.864	E	0.920
7	Cesar Chavez Avenue at Alameda Street	D	0.817	D	0.896
8	Cesar Chavez Street at Vignes Street	C	0.765	D	0.888
9	Vignes Street at Ramirez Street	A	0.350	A	0.470
10	US-101 SB Ramps at Commercial Street	A	0.321	B	0.660
11	Commercial Street at Center Street*	A	9.1	B	11.2
* This intersection is unsignalized and the LOS result is shown in seconds of delay rather than V/C.					

Figure 7 illustrates the future without project morning and evening peak hour traffic volumes at the eleven study intersections. These volumes represent conditions with ambient traffic growth in addition to traffic associated with the related projects.



Legend

Study Intersection

XX(X) AM(PM)



Metro Union Division Bus Maintenance Facility City of Los Angeles

FIGURE 7
Future Without Project AM and PM Peak Hour Traffic Volumes

FUTURE WITH PROJECT CONDITIONS

Project Trip Generation

The first step in analyzing the future traffic conditions with the project is to estimate the number of new trips expected to be generated by the proposed project. This section of the report describes the estimation of future traffic generation of the proposed project.

As described previously, the primary component of the proposed project would consist of a 360,000 square foot maintenance facility to be used to provide services for Metro’s proposed Union Division. A 20,000 square-foot central cash counting facility (CCCF) would also be located within the parking structure. Finally, an unmanned, two-pump compressed natural gas (CNG) fueling station would also be included in the final project design. This facility would be open for use by the general public and have separate ingress/egress from the other uses located within the proposed project.

Bus Maintenance Facility

Since the Institute of Transportation Engineers (ITE) does not have published trip generation data for a bus maintenance facility, a site specific traffic generation study was conducted at a similar existing facility operated by Metro. The project trip generation estimates were developed based on data collected from the existing Division 10 bus maintenance facility, located at 742 North Mission Road in the City of Los Angeles. This facility provides services to 271 buses and has 647 employees on site throughout the day.

Over a three day period, from 4:00 AM to 9:00 PM, employee and bus trips to and from the site were counted to determine the hourly traffic characteristics by trip type. The total number of morning and evening peak hour trips generated by both buses and employees at the existing Division 10 facility is shown in **Table 5**.

TABLE 5 - DIVISION 10 PROJECT TRIPS

Trip Type	Daily Traffic	AM Peak Hour			PM Peak Hour		
		Total	In	Out	Total	In	Out
Employee Trips	1,280	49	26	23	53	24	29
Bus Trips	647	23	5	18	22	20	2
Total Vehicle Trips	1,927	72	31	41	75	44	31

The proposed facility would provide services to approximately 200 buses and employ 579 individuals. To develop trip generation estimates for the proposed Union Division facility, the data collected from the Division 10 site was factored down by a ratio of the number of buses to be served (200 at Union Division / 271 at Division 10) and the number of employees who will be working at the site (579 at Union Division / 647 at Division 10). This results in a factor of 0.74 for the bus trips and 0.89 for the employee trips. These factors were applied to the trip generation data collected for the Division 10 facility and are presented in **Table 6**.

TABLE 6 - UNION DIVISION PROJECT TRIPS

Trip Type	Daily Traffic	AM Peak Hour			PM Peak Hour		
		Total	In	Out	Total	In	Out
Employee Trips	1,139	44	23	21	47	21	26
Bus Trips	479	17	4	13	17	15	2
Total Vehicle Trips	1,618	61	27	34	63	36	28

Due to the nature of the facility, an adjustment factor for heavy vehicles was needed to account for the additional space occupied by the buses. A passenger car equivalent (PCE) factor of 2.0 was applied to the number of buses to account for the large number of heavy vehicles accessing the site. The PCE factor was applied to the project trip generation estimates and is shown in **Table 7**.

TABLE 7 - UNION DIVISION ADJUSTED PROJECT TRIPS

Trip Type	Daily Traffic	AM Peak Hour			PM Peak Hour		
		Total	In	Out	Total	In	Out
Employee Trips	1,139	44	23	21	47	21	26
Bus Trips	958	34	8	26	34	30	4
Total Adjusted Trips	2,097	78	31	47	81	51	30

Central Cash Counting Facility

This facility would operate on a 6-day work week and would process all currency, coins and tokens received daily from bus fareboxes and rail ticket vending machines. Armored trucks collect revenue from Metro’s 11 operating divisions and deliver it to the CCCF for processing. A staff of 34 employees, approximately four management and administrative staff and 30 cash clerks, would be located within the facility. All staff would arrive at the facility between 6:00 - 7:00 am. At the same time, two armored trucks would leave the facility to collect all revenues generated by each Metro rail line. These vehicles would return to the facility between 2:00 – 3:00 pm.

Based on this information, the CCCF is not expected to generate any vehicle trips during either the AM or PM peak hours. To ensure this analysis is conservative, a total of five inbound and two outbound trips have been included in the trip generation estimates for the entire proposed project to capture any vehicle trips that may occur during the peak hour as a result of employees arriving to work late or the armored trucks leaving the site later than expected.

Compressed Natural Gas Fueling Station

A two-pump publically accessible fueling station would be constructed in the vicinity of the existing Cesar Chavez Avenue at Lyon Street intersection. This station would be unmanned and would be provided separate access than that provided for either the maintenance garage or the CCCF described above. Based on information obtained for existing facilities located in the cities of Los Angeles and Santa Clarita, this station is expected to generate approximately five vehicle trips per week. To ensure that this component is included in the overall project analysis, one inbound and one outbound vehicle trip has been added to both the AM and PM peak hours and would represent all traffic generated by this facility.

Based on the information provided above, the proposed project is expected to generate approximately 87 net new peak hour trips in the morning and 83 in the evening, as shown in **Table 8**.

TABLE 8 – TOTAL PROJECT TRIP GENERATION ESTIMATE

Trip Type	Daily Traffic	AM Peak Hour			PM Peak Hour		
		Total	In	Out	Total	In	Out
Maintenance Facility	2,097	78	31	47	81	51	30
Central Cash Counting Facility	60	7	5	2	0	0	0
CNG Fueling Station	4	2	1	1	2	1	1
Total Adjusted Trips	2,161	87	37	50	83	52	31

Project Trip Distribution and Assignment

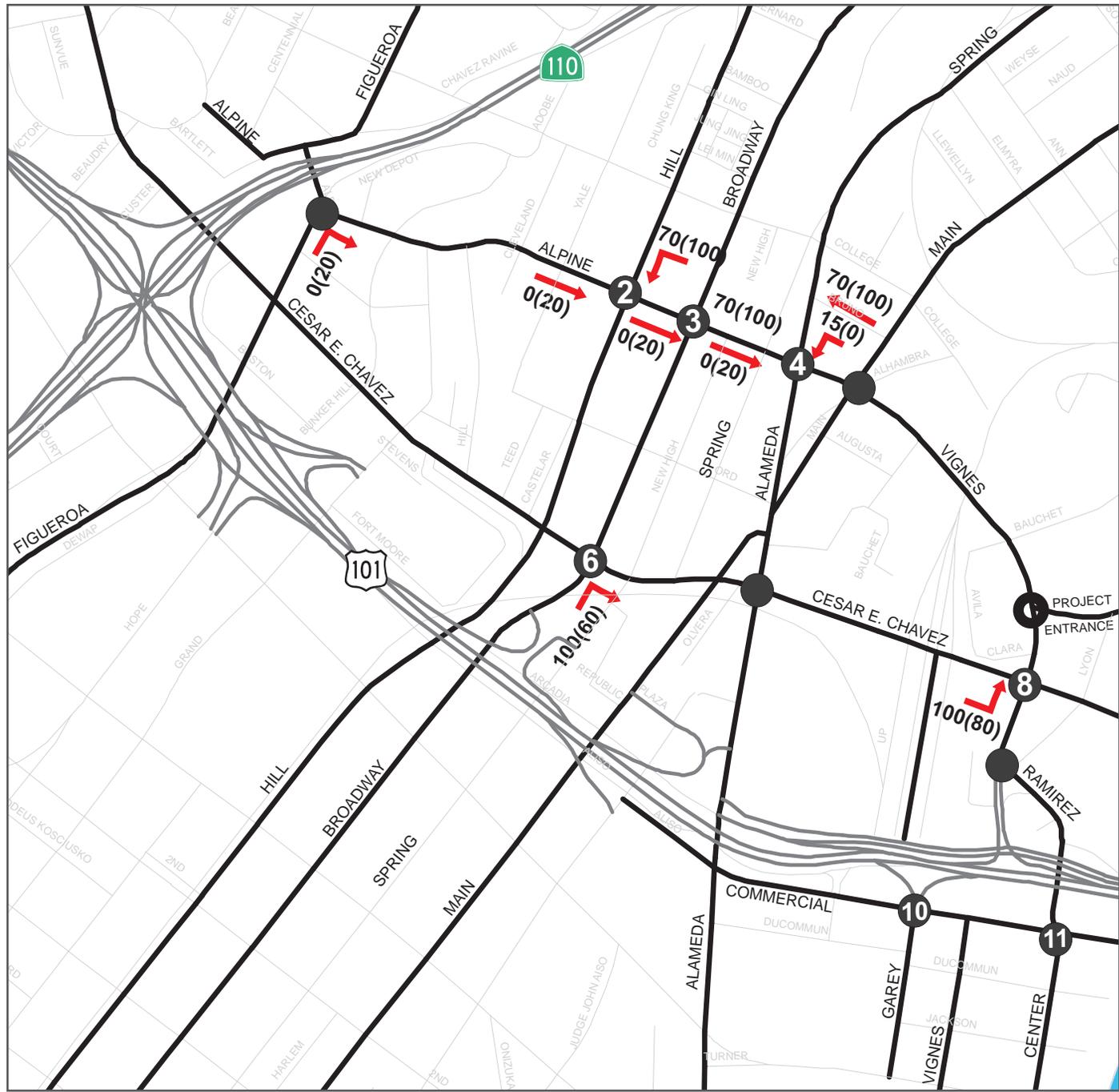
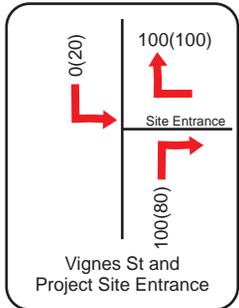
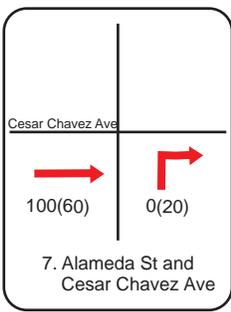
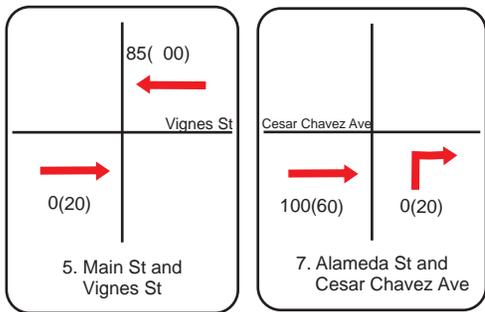
The next step in the forecast of project traffic is the anticipated distribution of the trip estimates. The trip distribution assumptions are used to determine the origin and destination of the vehicle trips associated with the proposed project. As discussed earlier, two separate trip types are associated with the proposed project: buses and employees. Since these trip types are different in nature, two separate trip distributions were developed.

The buses currently operating out of Metro’s Division 2 facility, as shown in **Table 9**, are to be transferred to the proposed facility upon its completion. The routes these buses are expected to utilize to reach their service areas were identified. A trip distribution for buses leaving the proposed facility was developed from this information and is shown on **Figure 8**.

TABLE 9 – PROPOSED BUS ROUTES OPERATING FROM UNION DIVISION

Route No.	Description
10, 48	Downtown LA to Avalon Station
18	Wilshire Center to Montebello via Sixth St & Whittier Blvd
26, 51, 52, 352	Hollywood – Compton – Artesia Transit Center
55, 355	Downtown LA to Imperial Station
60	Downtown LA to Artesia Station
66, 366	Wilshire Center to Montebello via 8 th St & E. Olympic Blvd
102	Baldwin Village to South Gate
105	West Hollywood to Vernon
121	Imperial Station to Whittwood Mall
200	Los Angeles to Echo Park
611	Maywood to Huntington Park Circular
612	Willowbrook to Huntington Park Shuttle
665	Cal State LA to City Terrace Shuttle

The geographic distribution of the employee trips was developed based on the location of the proposed facility and its proximity to several regional freeways and major arterials. Based on these factors, a distribution pattern was developed and is shown on **Figure 9**. Utilizing the project trip generation and the two trip distribution patterns, the project-only morning and evening peak hour traffic volumes were assigned to the street network and are shown on **Figure 10**.



Legend

Study Intersection

XX(XX) AM(PM)

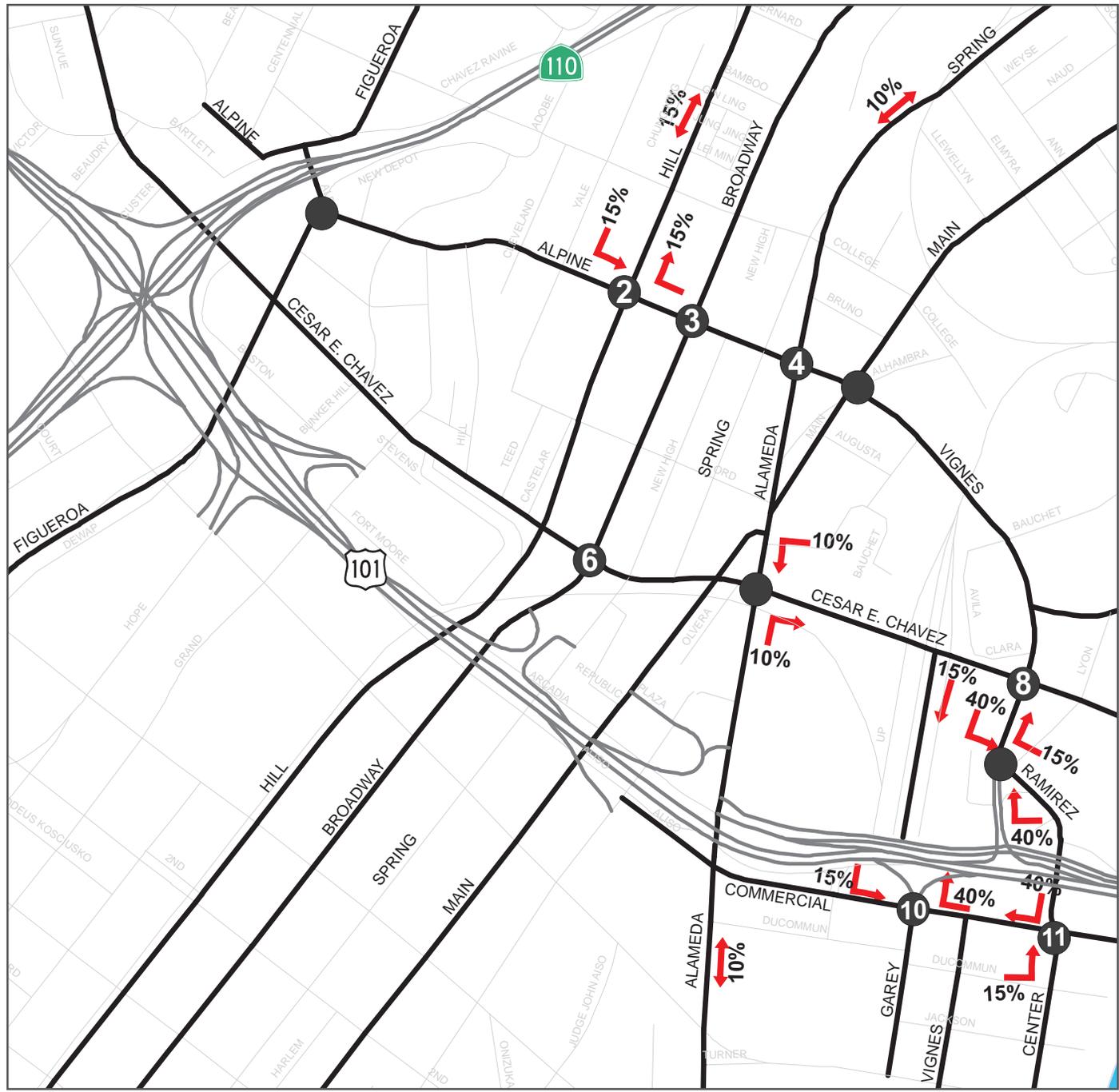
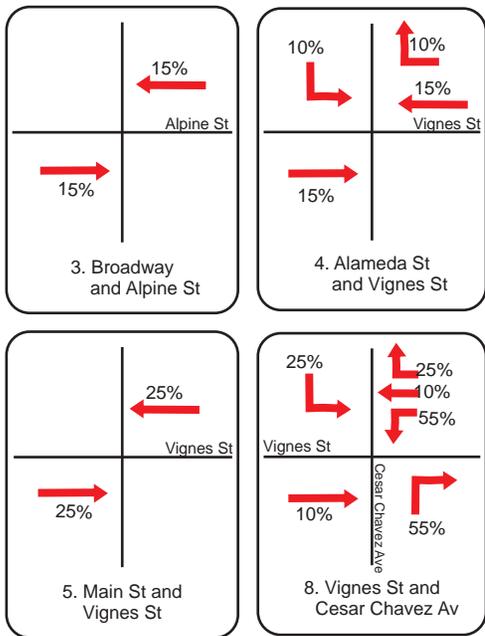


NOT TO SCALE



Metro Union Division Bus Maintenance Facility
City of Los Angeles

FIGURE 8
Bus Trip Distribution



Legend

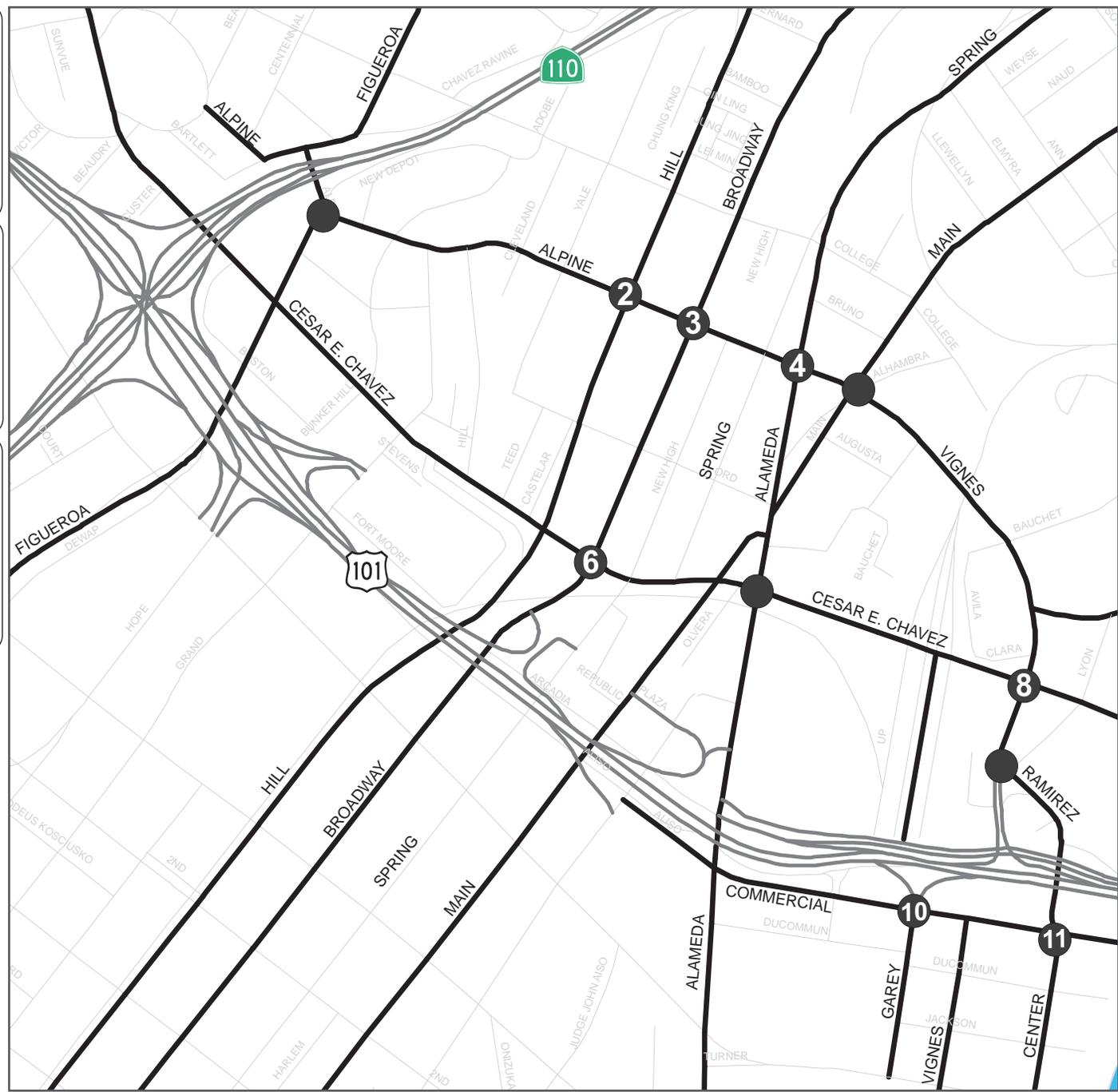
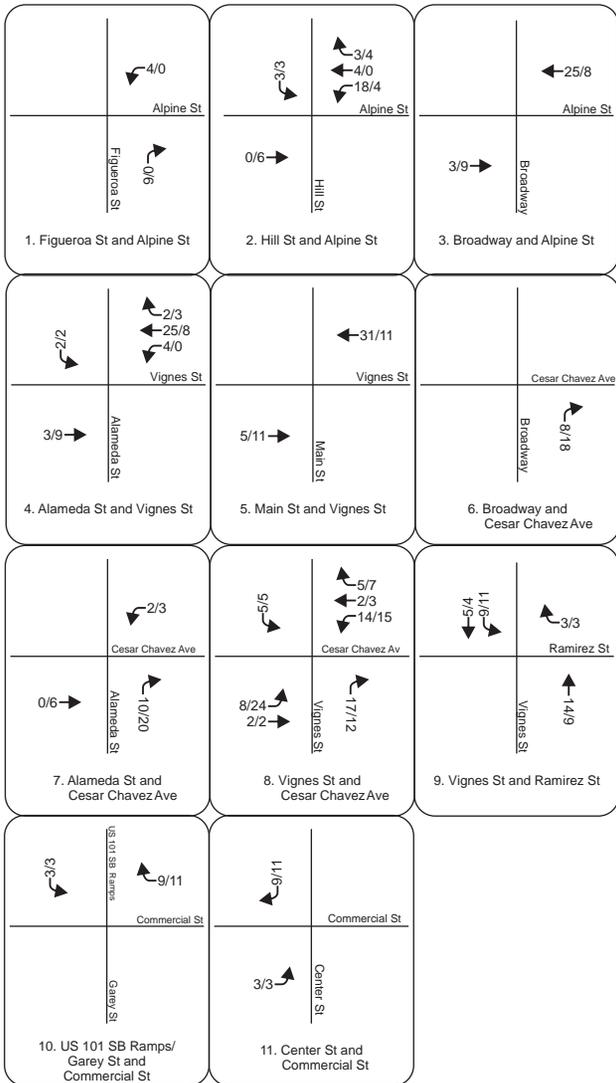
Study Intersection

XX(XX) AM(PM)



Metro Union Division Bus Maintenance Facility
City of Los Angeles

FIGURE 9
Employee Trip Distribution



Legend

Study Intersection



Metro Union Division Bus Maintenance Facility
City of Los Angeles

FIGURE 10
Project Trip Assignment

Level of Service Threshold Criteria

The significant impact definitions provided in LADOT’s *Traffic Study Policies and Procedures* were utilized in this study. These definitions state that a significant impact is deemed to have occurred if the proposed project causes any of the following conditions to be met:

Intersection Condition With Project Traffic		Project-Related Increase in V/C Ratio
LOS	V/C Ratio	
C	0.701-0.800	equal to or greater than 0.040
D	0.801-0.900	equal to or greater than 0.020
E or F	>0.900	equal to or greater than 0.010

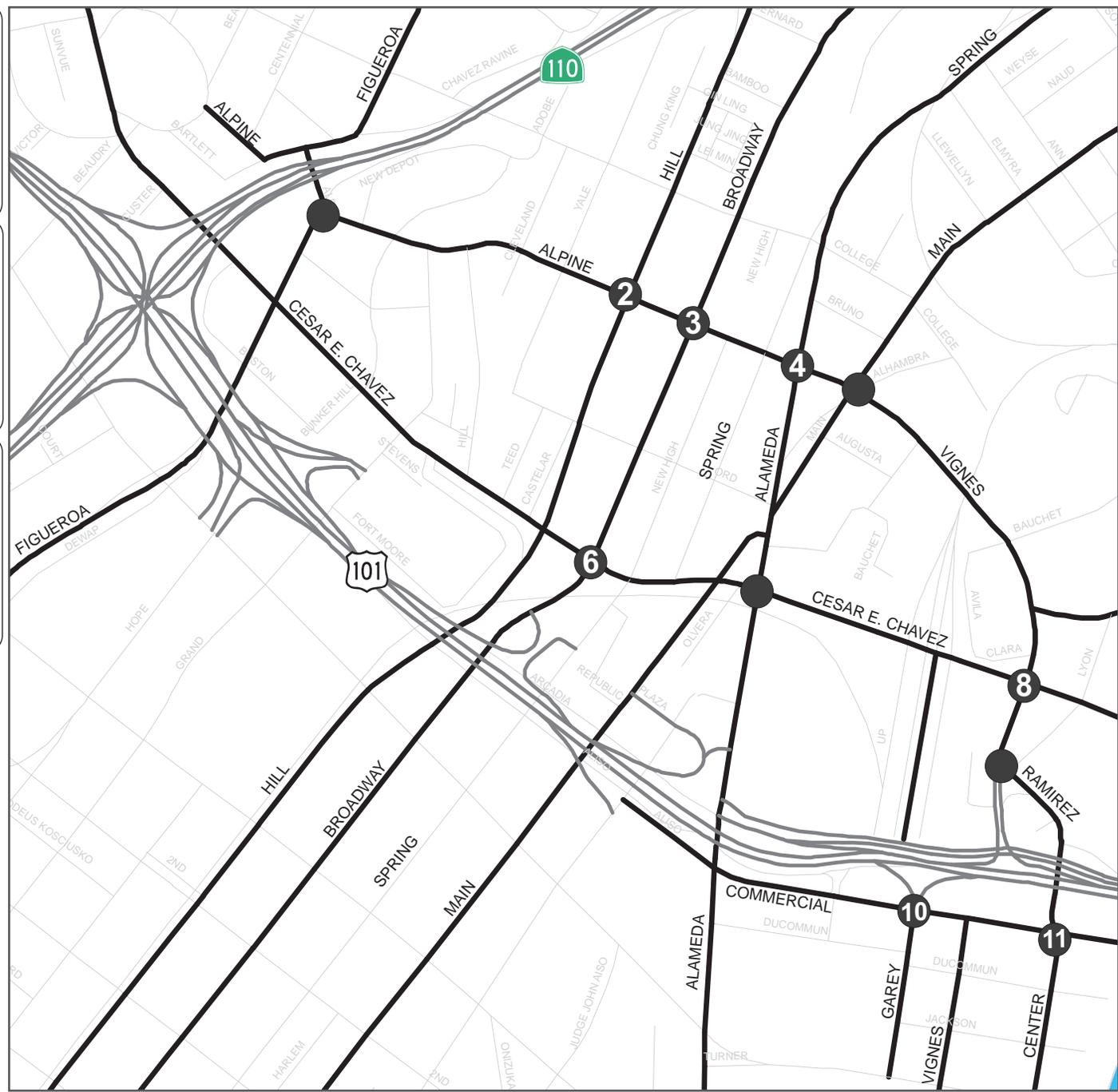
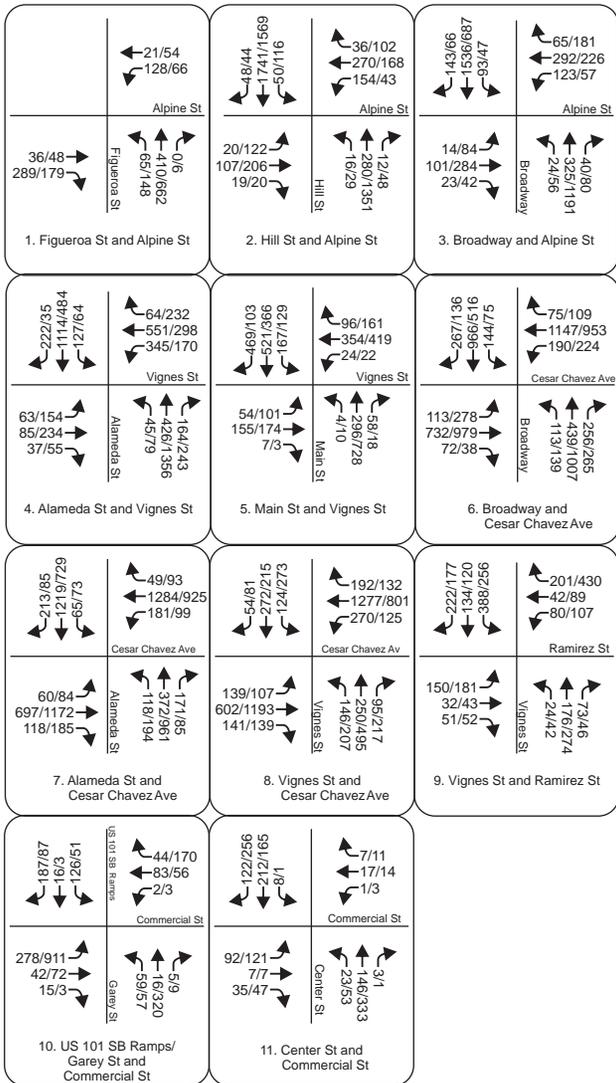
Future With Project Traffic Impact Analysis

The project-only peak hour traffic volumes shown on **Figure 10** were then added to the future without project traffic volumes. The resulting year 2009 future with project morning peak hour traffic volumes are shown on **Figure 11**. These traffic volumes were then utilized to calculate levels of service for the study intersections for Future with Project Conditions and are shown in **Table 10**.

TABLE 10: LOS ANALYSIS – FUTURE WITH PROJECT CONDITIONS

Intersection		Future No Project Conditions				Future with Project Conditions						Significant Impact?	
		AM Peak Hour		PM Peak Hour		AM Peak Hour			PM Peak Hour				
		LOS	V/C	LOS	V/C	LOS	V/C	Δ V/C*	LOS	V/C	Δ V/C*		
1	Alpine Street at Figueroa Street	A	0.370	A	0.402	A	0.373	0.003	A	0.405	0.003	N	N
2	Alpine Street at Hill Street	C	0.765	C	0.740	C	0.765	0.000	C	0.743	0.003	N	N
3	Alpine Street at Broadway	C	0.775	C	0.723	C	0.784	0.009	C	0.730	0.007	N	N
4	Alpine Street at Alameda Street	B	0.625	C	0.788	B	0.629	0.004	C	0.792	0.004	N	N
5	Vignes Street at Main Street	A	0.535	B	0.625	A	0.546	0.011	B	0.627	0.002	N	N
6	Cesar Chavez Avenue at Broadway	D	0.864	E	0.920	D	0.864	0.000	E	0.927	0.007	N	N
7	Cesar Chavez Avenue at Alameda Street	D	0.817	D	0.896	D	0.818	0.001	E	0.901	0.005	N	N
8	Cesar Chavez Avenue at Vignes Street	C	0.765	D	0.888	C	0.771	0.006	E	0.903	0.015	N	Y
9	Vignes Street at Ramirez Street	A	0.350	A	0.470	A	0.355	0.005	A	0.478	0.008	N	N
10	US-101 SB Ramps at Commercial Street	A	0.321	B	0.660	A	0.324	0.003	B	0.667	0.007	N	N
11	Commercial Street at Center Street*	A	9.1	B	11.2	A	9.1	0.0	B	11.3	0.1	N	N

* This intersection is unsignalized and the LOS result is shown in seconds of delay rather than V/C.



Legend

Study Intersection

XX(X) AM(PM)



Metro Union Division Bus Maintenance Facility City of Los Angeles

FIGURE 11
Future with Project AM and PM Peak Hour Traffic Volumes

As can be seen in **Table 10**, all eleven study intersections are expected to operate at acceptable levels of service in the morning peak hour and only ten of the eleven in the evening peak hour. The analysis indicates that the intersection of Cesar Chavez Avenue and Vignes Street is operate at LOS E and that the project-related increase in V/C ratio is greater than 0.010. Based on the City of Los Angeles’ thresholds of significance, the proposed project would create a significant traffic impact at this intersection during the evening peak hour. The detailed LOS worksheets are included in **Appendix C**.

Future with Project Mitigated Conditions

The following mitigation measure was developed, through close coordination with LADOT staff, to reduce the overall impact associated with project-related traffic to a level of insignificance, as defined under City of Los Angeles guidelines:

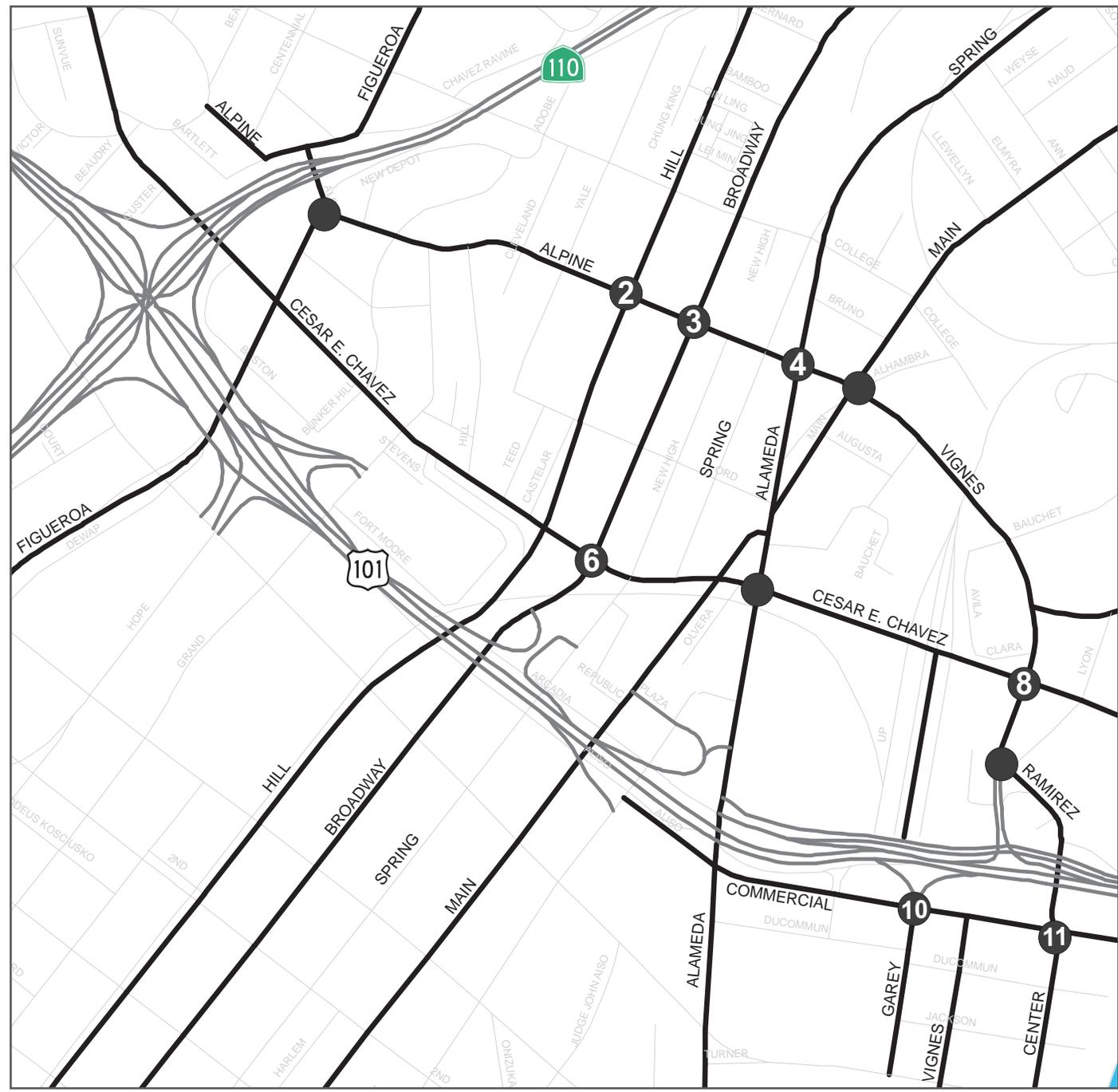
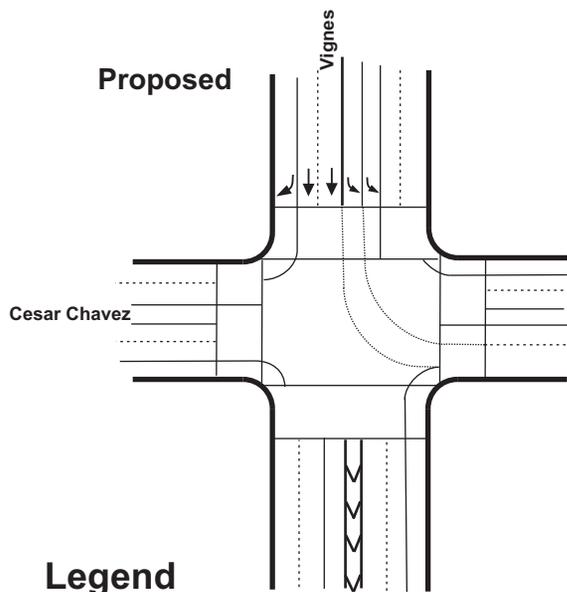
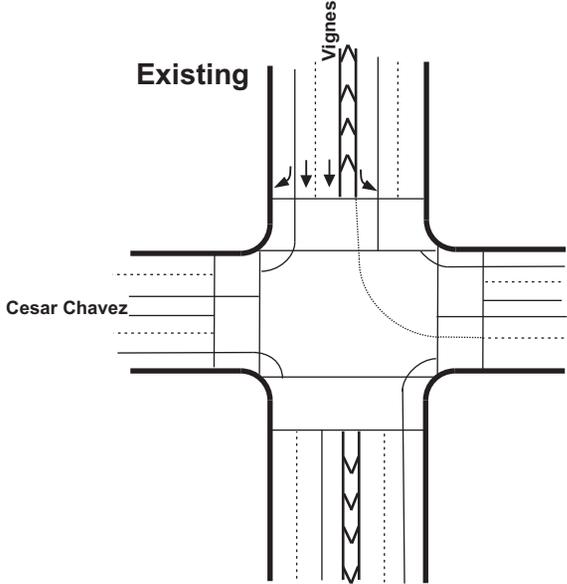
Cesar Chavez Avenue at Vignes Street: The impact at this intersection can be mitigated by adding a second southbound left-turn lane. Existing right-of-way at this intersection is sufficient to accommodate this additional lane. Currently, a 12-foot striped median is located between the existing southbound left-turn lane and the two through lanes which could be converted to a second left-turn lane. The eastern leg of the intersection currently has two receiving lanes that could accommodate this mitigation. When the intersection is analyzed with this improvement, the project-related traffic impact is reduced to below pre-project operational levels.

Figure 12 provides a conceptual-level view of the proposed mitigation and the resulting level of service analyses are shown in **Table 11**. Level of service analysis worksheets are provided in **Appendix C**.

TABLE 11: LOS ANALYSIS - FUTURE WITH PROJECT MITIGATED CONDITIONS

Intersection		Future No Project Conditions				Future with Mitigated Project Conditions							
		AM Peak Hour		PM Peak Hour		AM Peak Hour			PM Peak Hour			Significant Impact?	
		LOS	V/C	LOS	V/C	LOS	V/C	Δ V/C*	LOS	V/C	Δ V/C*		
8	Cesar Chavez Avenue at Vignes Street	C	0.764	D	0.888	C	0.771	0.007	D	0.813	(0.075)	N	N

Intersection 8



Legend

Study Intersection



NOT TO SCALE



Metro Union Division Bus Maintenance Facility
City of Los Angeles

FIGURE 12
Proposed Project Mitigation

SITE ACCESS ANALYSIS

Employee Access Analysis

Employee access into the facility is to be provided via a circular ramp located along Lyon Street south of Cesar Chavez Avenue. Currently, the southern approach of Lyon Street terminates in a cul-de-sac and its intersection with Cesar Chavez Avenue is signalized. When the proposed project is constructed, this intersection is expected to remain signalized but the northern approach will either be removed or restricted to a right-in/right-out operation for buses only. The project's low number of employee trips in the morning and evening peak hours and the existence of the traffic signal at the Lyon Street at Cesar Chavez Avenue intersection are expected to reduce any delays that may occur at the circular ramp to a level of insignificance.

Bus Access Analysis

Bus access into the site would be provided at an existing T-intersection that is located approximately 350 feet north of Cesar Chavez Avenue along Vignes Street. This driveway is currently shared by vehicles entering the Twin Towers Correctional Facility and buses using the former Terminal 31 employee parking lot as a layover. The driveway will continue to operate as a shared facility with the construction of the proposed project. Under the existing conditions, traffic volumes at the Vignes Street entrance are not great enough to warrant the installation of a traffic signal.

In an effort to identify the most efficient operating scenario for bus movements entering and exiting the proposed maintenance facility, three separate bus access alternatives were analyzed as a part of this study. The alternatives were as follows:

- Alternative 1 – Existing unsignalized driveway configuration.
- Alternative 2 – Installation of a traffic signal at existing driveway.
- Alternative 3 – Installation of a secondary exit as a right-in/right-out only facility along Cesar Chavez Avenue located at the existing Lyon Street intersection.

When the three driveway alternatives were analyzed under Future with Project Conditions, it was determined that none of the three alternatives are expected to create any significant delays or impacts to the surrounding roadway network. It was also determined that the traffic volumes at this intersection are not expected to be great enough to warrant the installation of a traffic signal.

Alternative 1 is expected to operate in a slightly less efficient manner than the other two alternatives, but will still operate at a very high level of efficiency. Although the traffic signal included in Alternative 2 is not warranted, this alternative is expected to be the most efficient in terms of buses movements, but it may reduce the efficiency of traffic traveling north-south along Vignes Street. Also, this alternative could potentially result in vehicles queuing into the Vignes Street at Cesar Chavez Avenue intersection. Alternative 3 has the least impact on the driveway operation due to the minimal difference in traffic volumes it creates. Under this alternative, approximately 10 percent of the buses entering and exiting the site would utilize the secondary driveway located along Cesar Chavez Avenue. This equates to a maximum of three buses using the secondary driveway. The impact of this reduction in bus traffic on the operating efficiency of the primary driveway is expected to be negligible. Based on the information provided above, Alternative 1 is considered the best option due to its high level of efficiency and reduced impact to the surrounding roadways in terms of changes to the existing traffic patterns and infrastructure.

CONGESTION MANAGEMENT PROGRAM SYSTEM ANALYSIS

The Congestion Management Program (CMP) was created statewide as a result of Proposition 111 and has been implemented locally by the Los Angeles County Metropolitan Transportation Authority. The CMP for Los Angeles County requires that the traffic impact of individual development projects of potential regional significance be analyzed. A specific system of arterial roadways plus all freeways comprise the CMP system. A total of 164 intersections are identified for monitoring on the system in Los Angeles County. This section describes the analysis of project-related impacts on the CMP system.

The CMP “Traffic Impact Analysis Guidelines” require analysis of all surface street monitoring locations where the proposed project adds 50 or more peak hour trips. The CMP also requires all freeway segments to be analyzed where the proposed project adds 150 or more trips during the peak hour.

The two closest CMP intersections to the project site are the intersections of Sunset Boulevard and Alvarado Street and Alameda Street and Washington Boulevard. Both intersections are located approximately 2.5 miles from the project site. Based on the trip generation estimates, the resulting project-only peak hour traffic volumes at the analyzed intersections, and the location of the proposed bus maintenance facility, it is anticipated that the trips associated with the project would result in less than 50 peak hour trips at this CMP intersection. Similarly, the project is not expected to meet the 150 trip threshold on the nearby freeways. Therefore an analysis of CMP impacts is not required for this EIR.

Appendix A
Memorandum of Understanding
(MOU)

SCOPING FOR TRAFFIC STUDY

This Memorandum of Understanding (MOU) acknowledges Los Angeles Department of Transportation (LADOT) requirements of traffic impact analysis for the following project:

Project Name: Metro Bus Maintenance and Operations Facility
Project Address: 920 Vignes Street, Los Angeles, CA 90031
Project Description: 358,575 square foot development including 2-story maintenance/office building and 3-story parking structure.

Geographic Distribution: See attached graphic

Trip Generation Rate(s): See attached trip generation methodology and tables

Project Buildout Year: 2009 Ambient or CMP Growth Rate: 1% per year

Related Project: To be provided by LADOT staff

Study Intersections

(Subject to revision after CMP requirement, related projects, trip generation and distribution are determined)

- | | |
|--------------------------------|-------------------------------------|
| 1. Alpine St & Figueroa St | 7. Cesar Chavez Ave & Alameda St |
| 2. Alpine St & Hill St | 8. Caesar Chavez & Vignes St |
| 3. Alpine St & Broadway | 9. Vignes St & Ramirez St |
| 4. Vignes St & Alameda St | 10. US-101 SB Ramps & Commercial St |
| 5. Vignes St & Main St | 11. Center St & Commercial St |
| 6. Cesar Chavez Ave & Broadway | |

Trip Credits: (Exact amount of credit subject to approval by LADOT)

Transportation Demand Management (TDM).....	No
Transit.....	No
Existing Active Land Use.....	Yes
Previous Land Use.....	No
Internal Trip.....	No
Pass-By Trip.....	No

This analysis must follow latest LADOT Traffic Study guidelines.

Consultant
Name: Meyer, Mohaddes Associates
Address: 707 Wilshire Boulevard, Suite 4810
Los Angeles, CA 90017
Phone #: (213) 488-0345

Developer
Metro Union Division
One Gateway Plaza
Los Angeles, CA 90012

Approved by: 488-9440
Matthew Simons, MMA Date

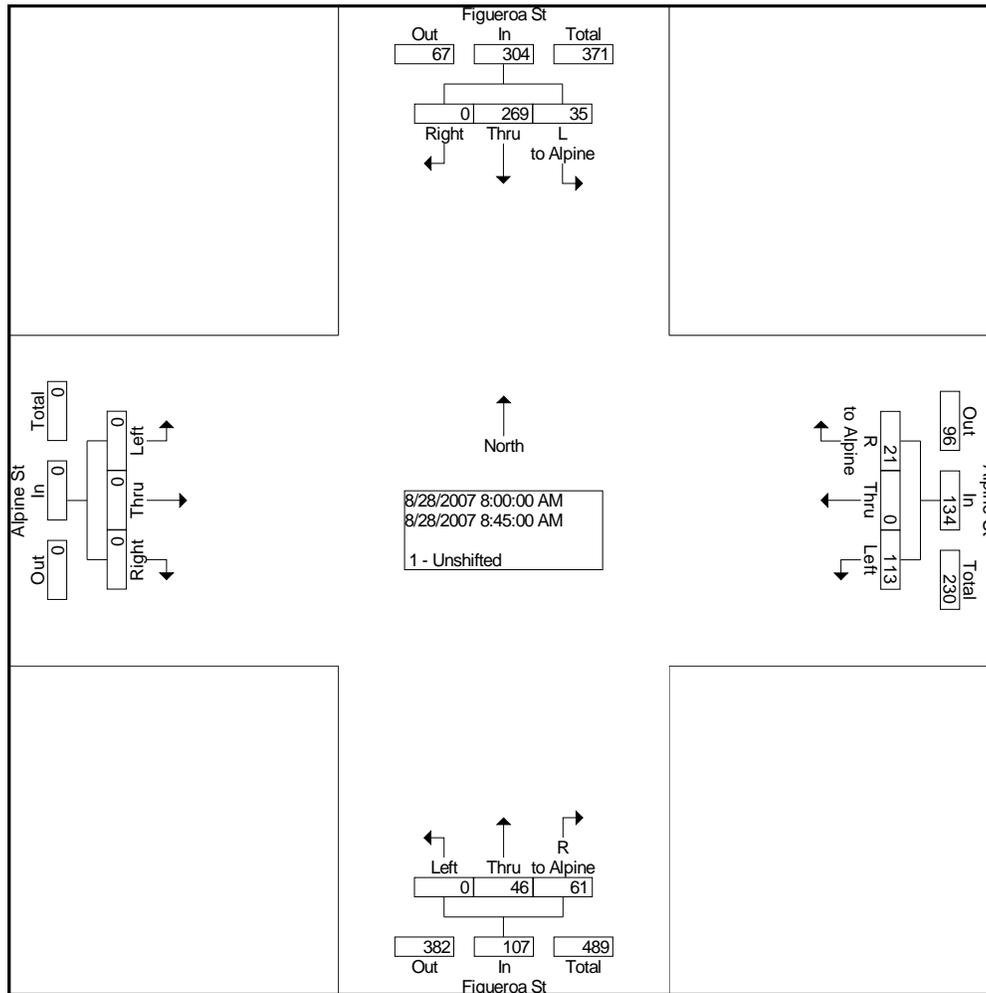

LADOT Representative Date 8/17/07

Appendix B Traffic Counts

City Traffic Counters
626.256.4171

File Name : AlpFig
Site Code : 00000000
Start Date : 8/28/2007
Page No : 2

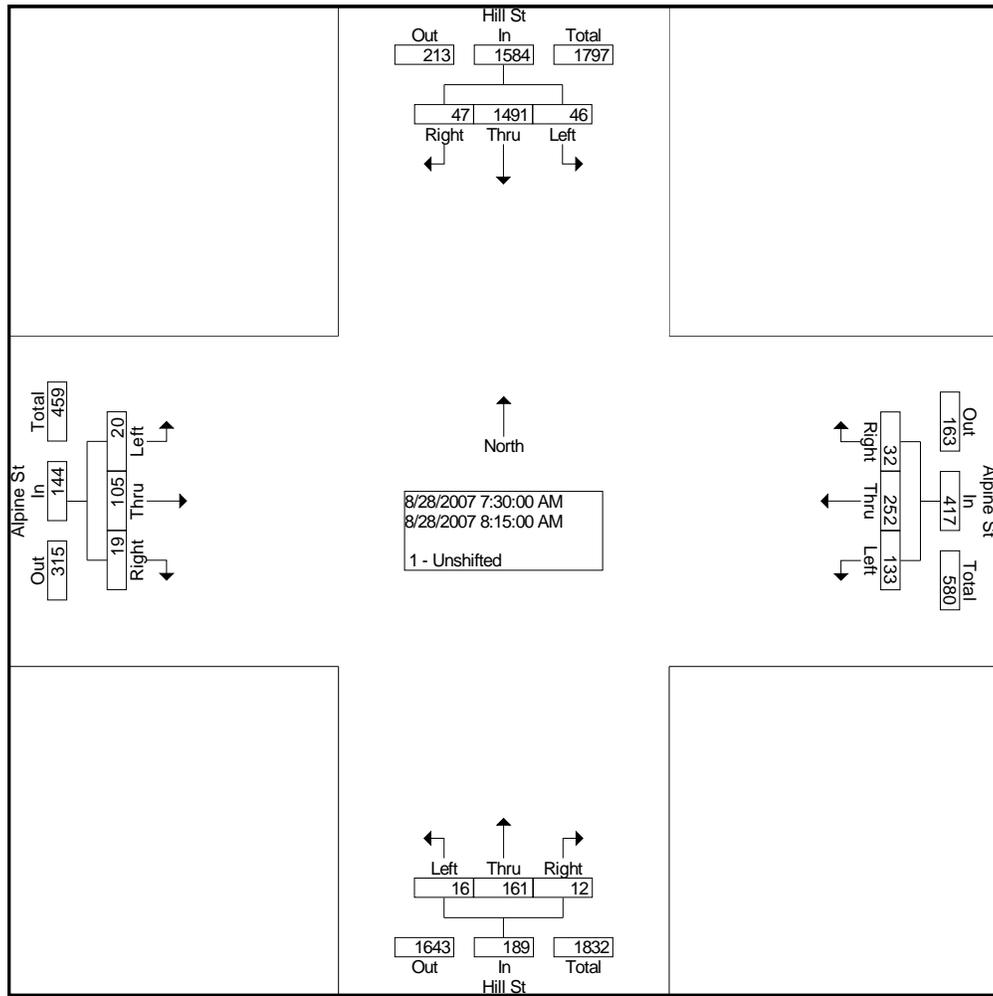
Start Time	Figueroa St Southbound				Alpine St Westbound				Figueroa St Northbound				Alpine St Eastbound				Int. Total
	L to Alpine	Thru	Right	App. Total	Left	Thru	R to Alpine	App. Total	Left	Thru	R to Alpine	App. Total	Left	Thru	Right	App. Total	
Peak Hour From 07:00 AM to 11:45 AM - Peak 1 of 1																	
Intersection	08:00 AM																
Volume	35	269	0	304	113	0	21	134	0	46	61	107	0	0	0	0	545
Percent	11.5	88.5	0.0		84.3	0.0	15.7		0.0	43.0	57.0		0.0	0.0	0.0		
08:00 Volume	7	72	0	79	27	0	7	34	0	14	16	30	0	0	0	0	143
Peak Factor	0.953																
High Int.	08:15 AM																
Volume	14	72	0	86	43	0	4	47	0	14	16	30	6:45:00 AM				
Peak Factor	0.884				0.713				0.892								



City Traffic Counters
626.256.4171

File Name : HillAlp
Site Code : 00000000
Start Date : 8/28/2007
Page No : 2

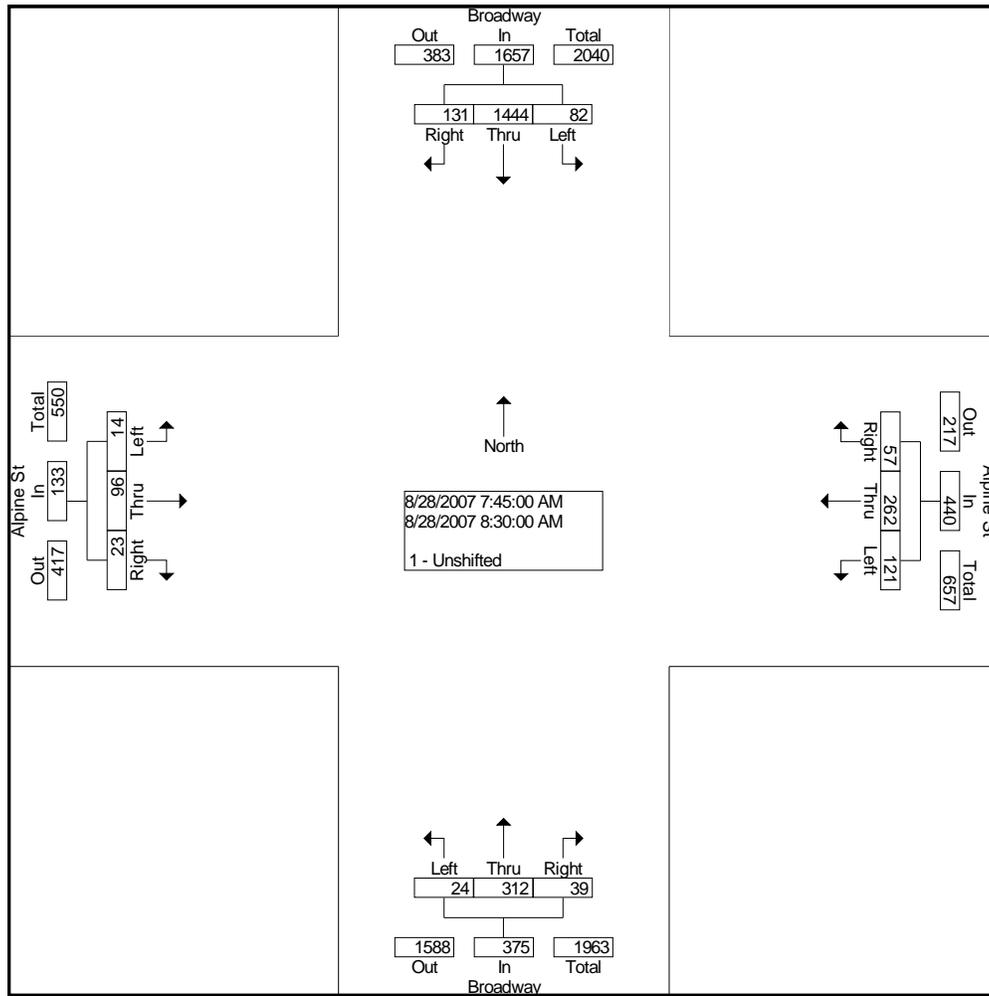
Start Time	Hill St Southbound				Alpine St Westbound				Hill St Northbound				Alpine St Eastbound				Int. Total			
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total				
Peak Hour From 07:00 AM to 11:45 AM - Peak 1 of 1																				
Intersection	07:30 AM																			
Volume	46	1491	47	1584	133	252	32	417	16	161	12	189	20	105	19	144	2334			
Percent	2.9	94.1	3.0		31.9	60.4	7.7		8.5	85.2	6.3		13.9	72.9	13.2					
07:45																				
Volume	8	400	13	421	38	55	11	104	4	53	5	62	2	16	5	23	610			
Peak Factor	0.957																			
High Int.	07:30 AM																			
Volume	10	408	10	428	08:15 AM				07:45 AM				08:00 AM							
Peak Factor	0.925								0.883				0.762				0.735			



City Traffic Counters
626.256.4171

File Name : BroadALp
Site Code : 00000000
Start Date : 8/28/2007
Page No : 2

Start Time	Broadway Southbound				Alpine St Westbound				Broadway Northbound				Alpine St Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour From 07:00 AM to 11:45 AM - Peak 1 of 1																	
Intersection	07:45 AM																
Volume	82	1444	131	1657	121	262	57	440	24	312	39	375	14	96	23	133	2605
Percent	4.9	87.1	7.9		27.5	59.5	13.0		6.4	83.2	10.4		10.5	72.2	17.3		
08:00 Volume	19	386	28	433	30	63	13	106	2	75	11	88	7	30	4	41	668
Peak Factor	0.975																
High Int.	08:00 AM																
Volume	19	386	28	433	24	78	15	117	9	84	7	100	7	30	4	41	0.975
Peak Factor	0.957				0.940				0.938				0.811				

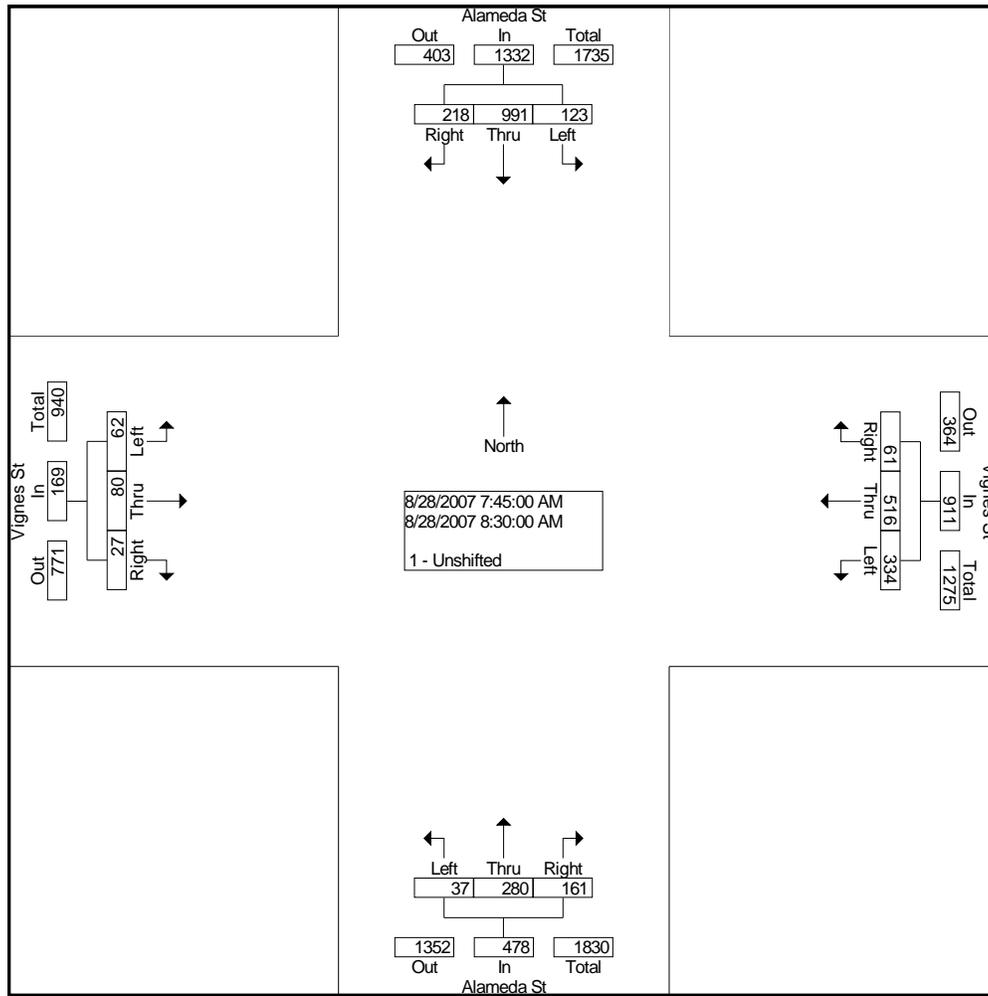


City Traffic Counters

626.256.4171

File Name : AlamVig
 Site Code : 00000000
 Start Date : 8/28/2007
 Page No : 2

Start Time	Alameda St Southbound				Vignes St Westbound				Alameda St Northbound				Vignes St Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour From 07:00 AM to 11:45 AM - Peak 1 of 1																	
Intersection	07:45 AM																
Volume	123	991	218	1332	334	516	61	911	37	280	161	478	62	80	27	169	2890
Percent	9.2	74.4	16.4		36.7	56.6	6.7		7.7	58.6	33.7		36.7	47.3	16.0		
07:45 Volume	29	281	50	360	90	130	14	234	6	59	48	113	12	26	10	48	755
Peak Factor	0.957																
High Int.	07:45 AM																
Volume	29	281	50	360	81	154	21	256	7	92	45	144	12	26	10	48	
Peak Factor	0.925				0.890				0.830				0.880				



TRAFFIC COUNT SUMMARY

City of Los Angeles
Department of Transportation
(Rev Apr 92)

STREET:
North/South MAIN ST

East/West ALPINE ST/VIGNES ST

Day: TUESDAY Date: DEC 2, 1997 Weather: CLEAR

Hours: 7-10 AM 3-6 PM

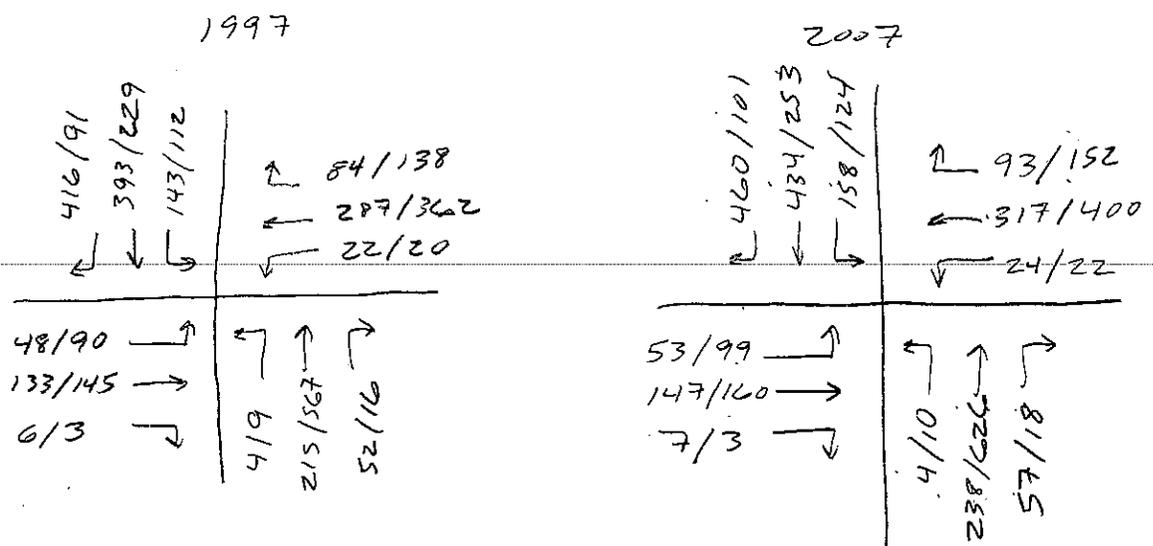
School Day: YES District: CENTRAL

	N/B	S/B	E/B	W/B
DUAL-WHEELED	165	173	31	138
BIKES	0	0	0	0
BUSES	24	24	6	12

	N/B TIME	S/B TIME	E/B TIME	W/B TIME
AM PK 15 MIN	89 8.45	310 8.15	67 7.45	122 9.15
PM PK 15 MIN	169 5.15	125 3.30	66 5.15	133 5.30
AM PK HOUR	271 8.00	1033 7.30	202 7.45	393 9.00
PM PK HOUR	596 4.45	443 3.15	238 5.00	520 5.00

NORTHBOUND Approach					SOUTHBOUND Approach					TOTAL		XING S/L		XING N/L	
Hours	Lt	Th	Rt	Total	Hours	Lt	Th	Rt	Total	N-S	Ped	Sch	Ped	Sch	
7-8	5	174	23	202	7-8	142	337	292	771	973	4	0	2	0	
8-9	4	215	52	271	8-9	143	393	416	952	1223	3	0	7	0	
9-10	12	162	33	207	9-10	94	273	148	515	722	3	0	5	0	
3-4	3	278	18	299	3-4	112	229	91	432	731	7	0	4	0	
4-5	10	428	19	457	4-5	84	228	101	413	870	10	0	7	0	
5-6	9	567	16	592	5-6	85	189	85	359	951	13	0	5	0	
TOTAL	43	1824	161	2028	TOTAL	660	1649	1133	3442	5470	40	0	30	0	

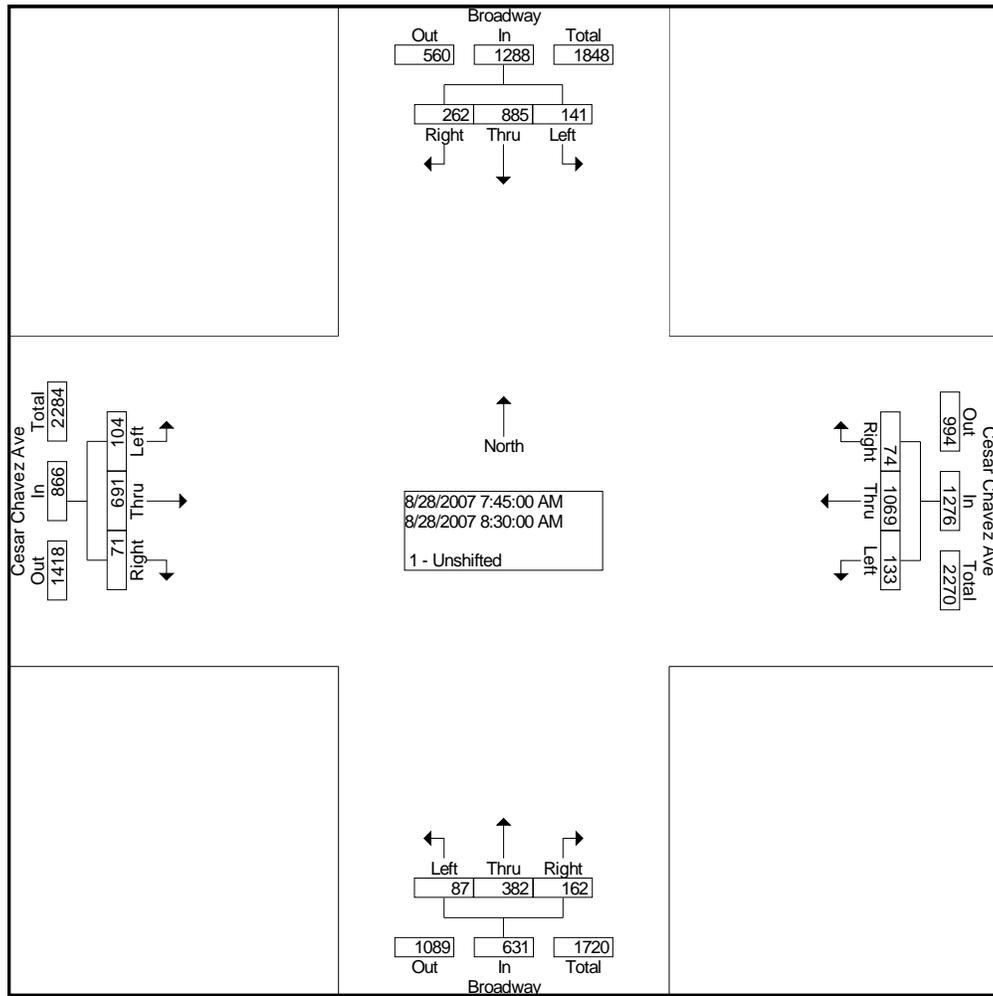
EASTBOUND Approach					WESTBOUND Approach					TOTAL		XING W/L		XING E/L	
Hours	Lt	Th	Rt	Total	Hours	Lt	Th	Rt	Total	E-W	Ped	Sch	Ped	Sch	
7-8	29	146	2	177	7-8	10	155	58	223	400	2	0	12	0	
8-9	40	132	3	175	8-9	12	209	100	321	496	1	0	10	0	
9-10	48	133	6	187	9-10	22	287	84	393	580	0	0	15	0	
3-4	56	116	8	180	3-4	26	318	101	445	625	1	0	16	2	
4-5	85	93	3	181	4-5	20	304	72	396	577	0	0	8	0	
5-6	90	145	3	238	5-6	20	362	138	520	758	0	0	5	0	
TOTAL	348	765	25	1138	TOTAL	110	1635	553	2298	3436	4	0	66	2	



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File Name : cesC_broad
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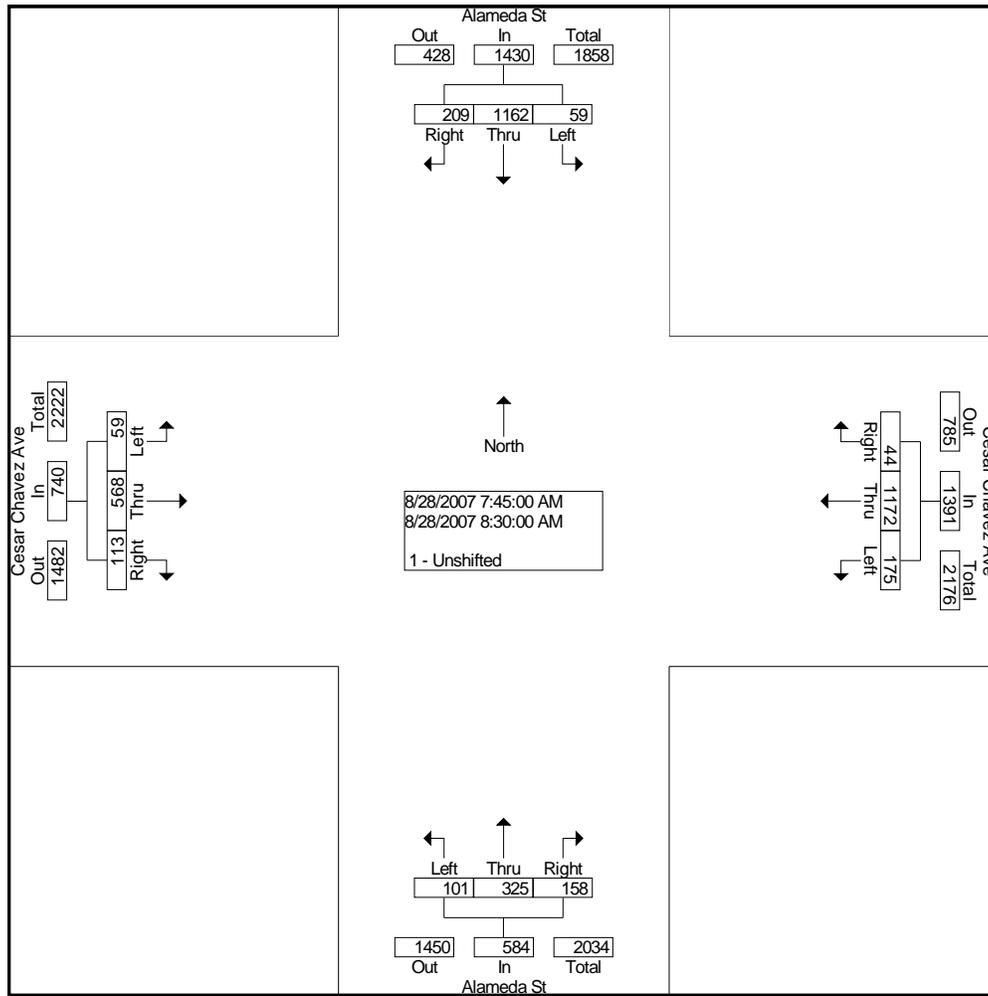
Start Time	Broadway Southbound				Cesar Chavez Ave Westbound				Broadway Northbound				Cesar Chavez Ave Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour From 07:00 AM to 11:45 AM - Peak 1 of 1																	
Intersection	07:45 AM																
Volume	141	885	262	1288	133	1069	74	1276	87	382	162	631	104	691	71	866	4061
Percent	10.9	68.7	20.3		10.4	83.8	5.8		13.8	60.5	25.7		12.0	79.8	8.2		
07:45 Volume	43	254	64	361	39	243	22	304	17	103	37	157	26	178	17	221	1043
Peak Factor	0.973																
High Int.	07:45 AM																
Volume	43	254	64	361	08:00 AM				08:15 AM				07:45 AM				
Peak Factor				0.892	30	298	20	348	27	94	47	168	26	178	17	221	0.980
								0.917				0.939					



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File Name : CesC_Alam
Site Code : 00000000
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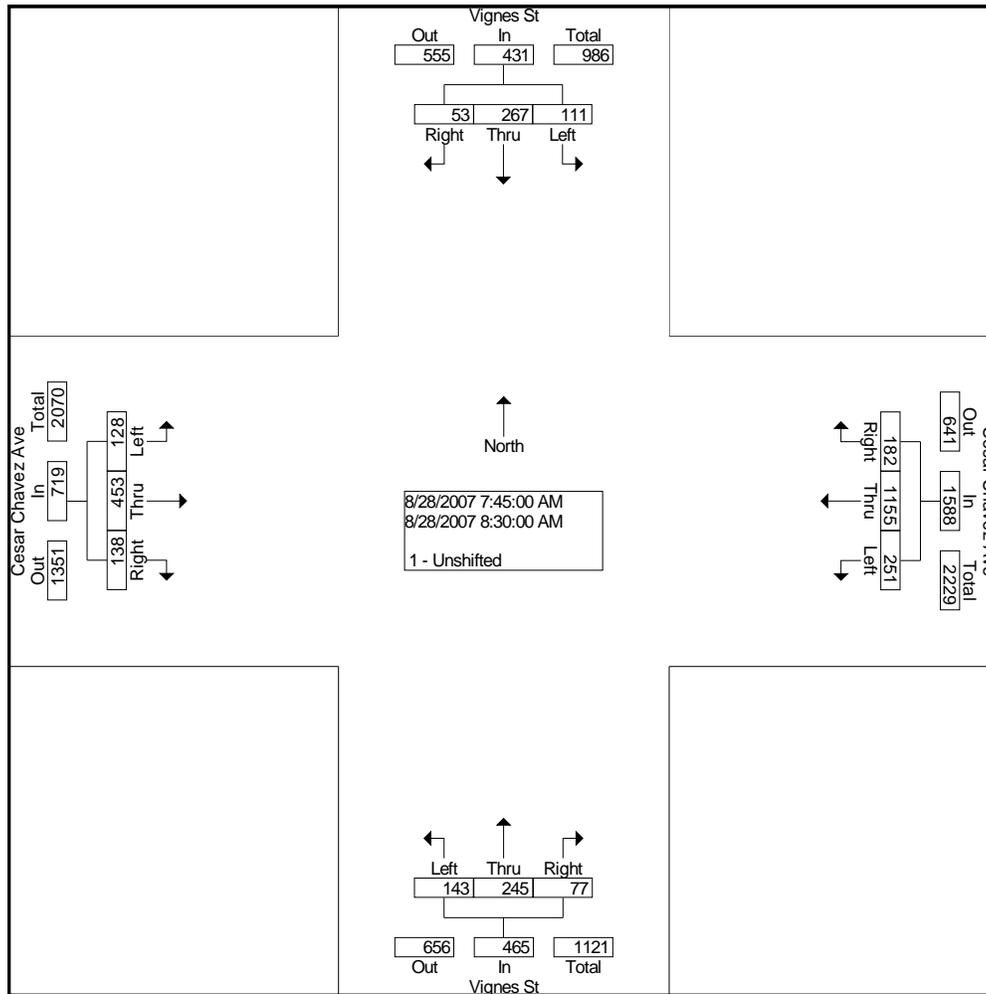
Start Time	Alameda St Southbound				Cesar Chavez Ave Westbound				Alameda St Northbound				Cesar Chavez Ave Eastbound				Int. Total		
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total			
Peak Hour From 07:00 AM to 11:45 AM - Peak 1 of 1																			
Intersection	07:45 AM																		
Volume	59	1162	209	1430	175	1172	44	1391	101	325	158	584	59	568	113	740	4145		
Percent	4.1	81.3	14.6		12.6	84.3	3.2		17.3	55.7	27.1		8.0	76.8	15.3				
08:30 Volume	14	293	62	369	43	291	16	350	29	90	41	160	17	143	26	186	1065		
Peak Factor	0.973																		
High Int.	08:30 AM																		
Volume	14	293	62	369	07:45 AM	47	302	12	361	08:30 AM	29	90	41	160	08:00 AM	16	147	35	198
Peak Factor	0.969				0.963				0.913				0.934						



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File Name : VigCesarC
Site Code : 00000000
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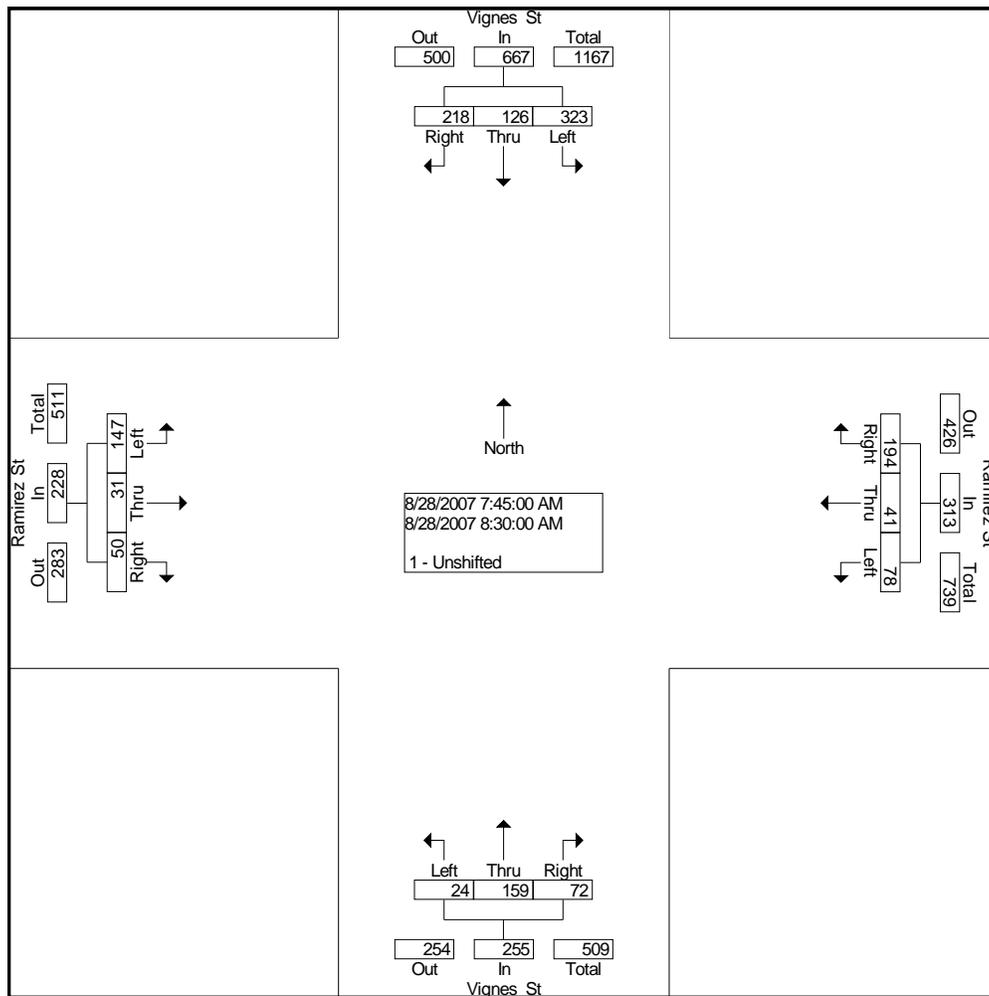
Start Time	Vignes St Southbound				Cesar Chavez Ave Westbound				Vignes St Northbound				Cesar Chavez Ave Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour From 07:00 AM to 11:45 AM - Peak 1 of 1																	
Intersection	07:45 AM																
Volume	111	267	53	431	251	1155	182	1588	143	245	77	465	128	453	138	719	3203
Percent	25.8	61.9	12.3		15.8	72.7	11.5		30.8	52.7	16.6		17.8	63.0	19.2		
08:00 Volume	31	69	16	116	66	296	44	406	39	78	18	135	34	103	29	166	823
Peak Factor	0.973																
High Int.	08:00 AM																
Volume	31	69	16	116	72	323	50	445	39	78	18	135	35	119	42	196	
Peak Factor	0.929				0.892				0.861				0.917				



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File Name : VigRam
Site Code : 00000000
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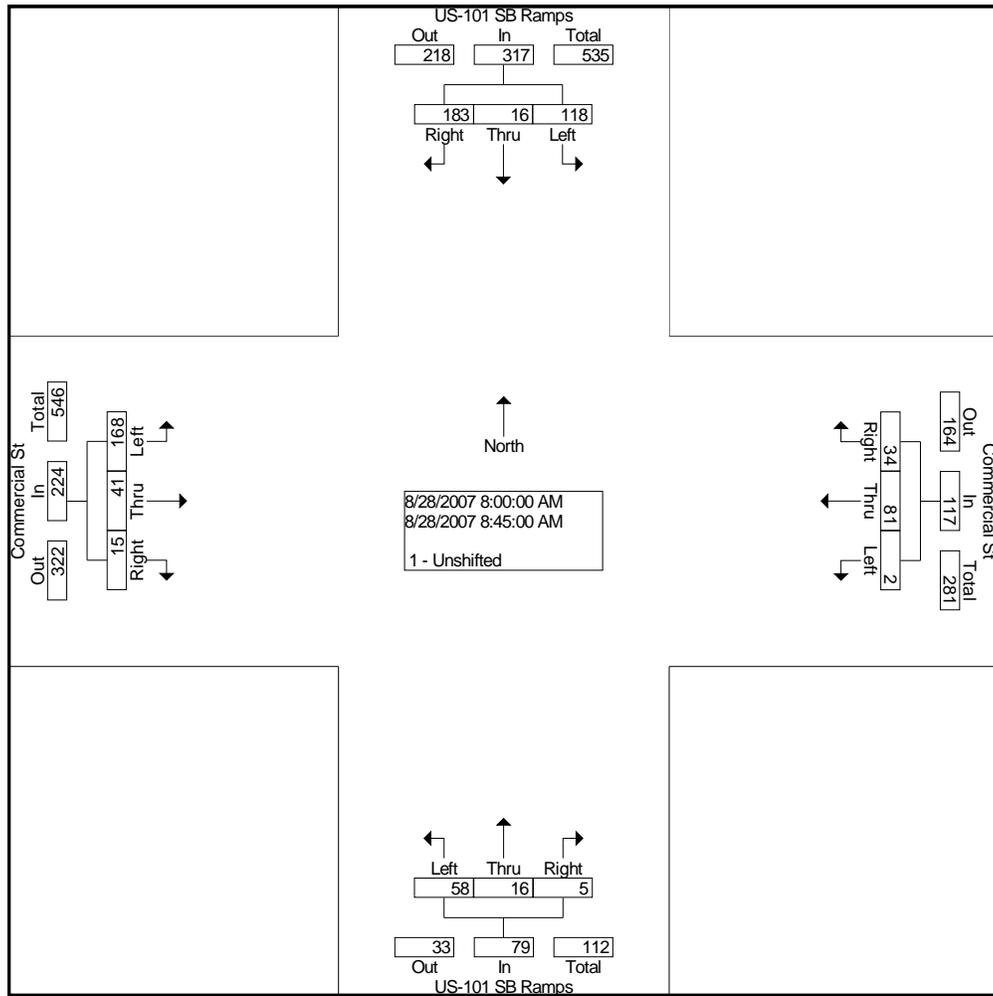
Start Time	Vignes St Southbound				Ramirez St Westbound				Vignes St Northbound				Ramirez St Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour From 07:00 AM to 11:45 AM - Peak 1 of 1																	
Intersection	07:45 AM																
Volume	323	126	218	667	78	41	194	313	24	159	72	255	147	31	50	228	1463
Percent	48.4	18.9	32.7		24.9	13.1	62.0		9.4	62.4	28.2		64.5	13.6	21.9		
08:00																	
Volume	78	40	53	171	27	6	58	91	7	47	21	75	34	9	11	54	391
Peak Factor	0.935																
High Int.	07:45 AM																
Volume	86	35	58	179	27	6	58	91	9	46	22	77	40	7	13	60	
Peak Factor	0.932				0.860				0.828				0.950				



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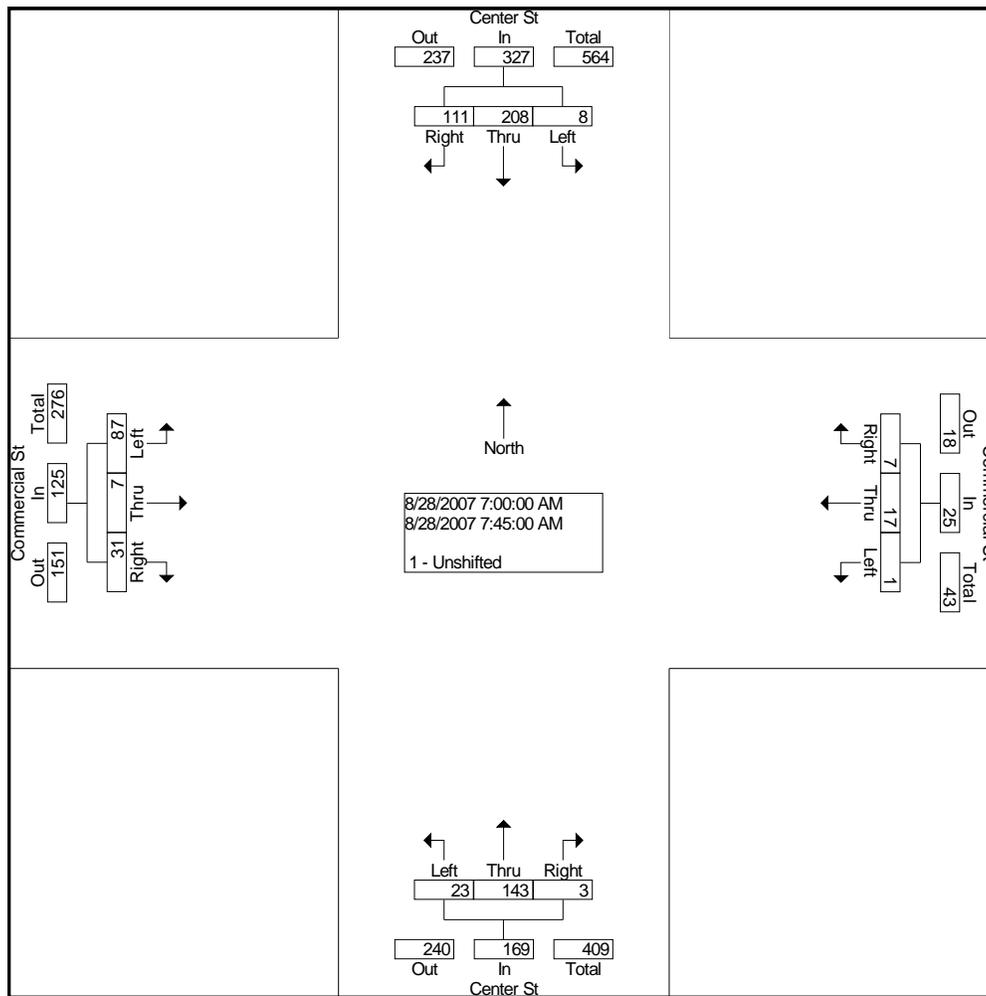
Start Time	US-101 SB Ramps Southbound				Commercial St Westbound				US-101 SB Ramps Northbound				Commercial St Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour From 07:00 AM to 11:45 AM - Peak 1 of 1																	
Intersection	08:00 AM																
Volume	118	16	183	317	2	81	34	117	58	16	5	79	168	41	15	224	737
Percent	37.2	5.0	57.7		1.7	69.2	29.1		73.4	20.3	6.3		75.0	18.3	6.7		
08:30																	
Volume	25	5	55	85	1	22	12	35	15	3	0	18	50	6	5	61	199
Peak Factor	0.926																
High Int.	08:30 AM																
Volume	25	5	55	85	1	22	12	35	17	5	1	23	44	17	3	64	0.926
Peak Factor	0.836																
	08:15 AM																
	08:00 AM																
	0.859																
	0.875																



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File Name : CenComm
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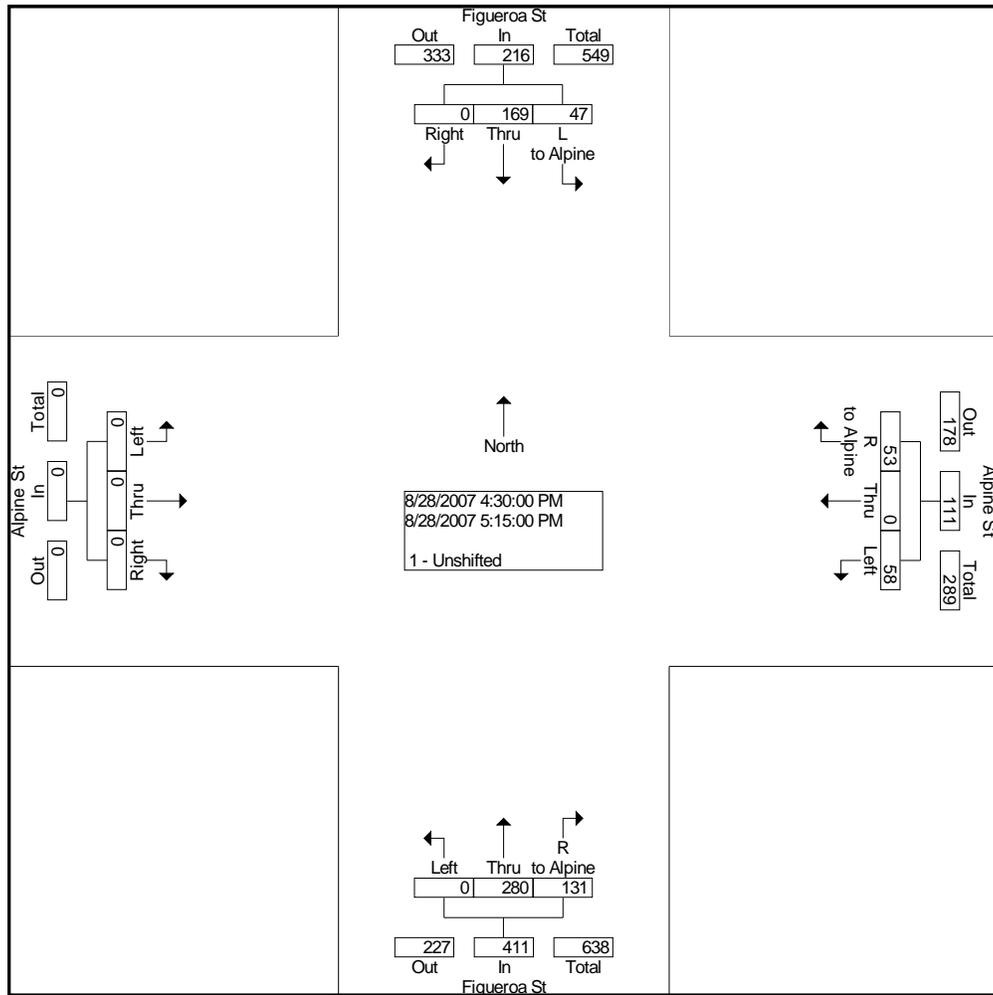
Start Time	Center St Southbound				Commercial St Westbound				Center St Northbound				Commercial St Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour From 07:00 AM to 11:45 AM - Peak 1 of 1																	
Intersection	07:00 AM																
Volume	8	208	111	327	1	17	7	25	23	143	3	169	87	7	31	125	646
Percent	2.4	63.6	33.9		4.0	68.0	28.0		13.6	84.6	1.8		69.6	5.6	24.8		
07:00 Volume	4	50	39	93	0	8	5	13	7	40	1	48	25	2	7	34	188
Peak Factor	0.859																
High Int.	07:15 AM																
Volume	2	68	29	99	0	8	5	13	6	45	0	51	25	2	8	35	
Peak Factor				0.826				0.481				0.828				0.893	



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File Name : AlpFig
Site Code : 00000000
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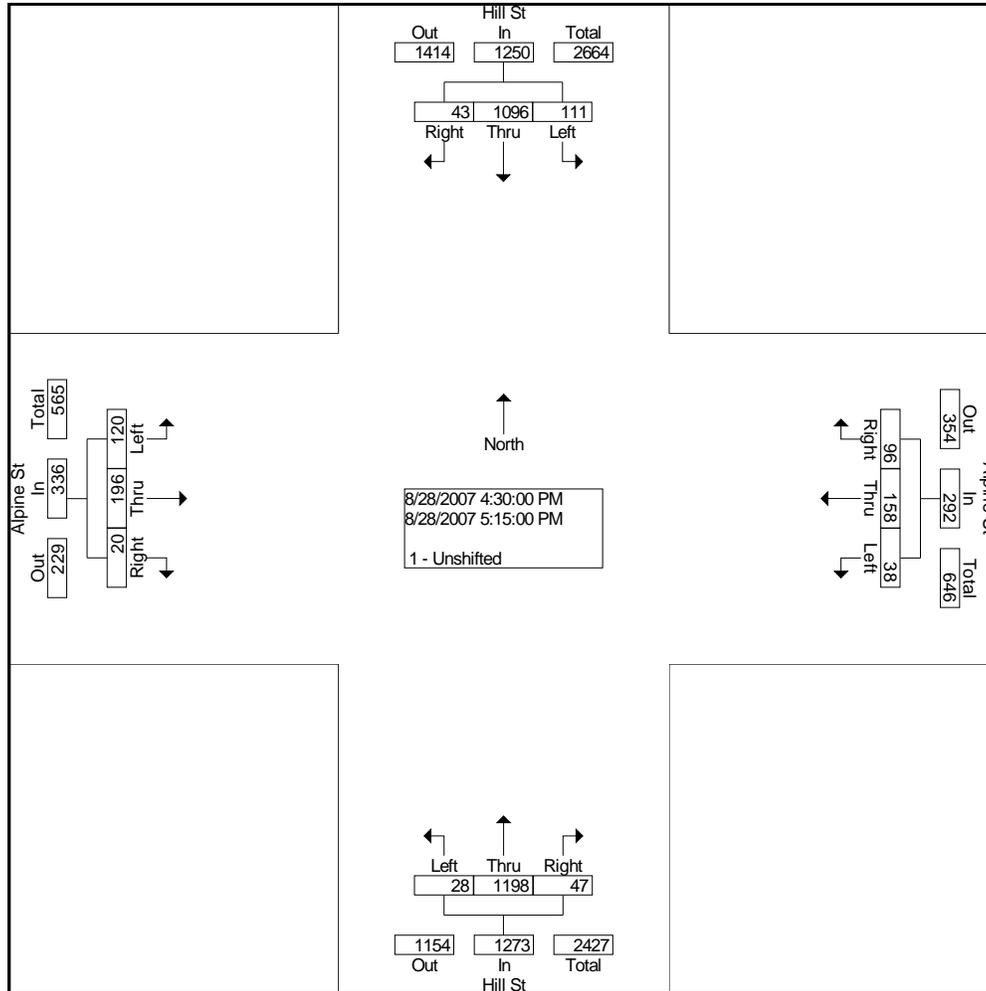
Start Time	Figueroa St Southbound				Alpine St Westbound				Figueroa St Northbound				Alpine St Eastbound				Int. Total
	L to Alpine	Thru	Right	App. Total	Left	Thru	R to Alpine	App. Total	Left	Thru	R to Alpine	App. Total	Left	Thru	Right	App. Total	
Peak Hour From 12:00 PM to 05:45 PM - Peak 1 of 1																	
Intersection	04:30 PM																
Volume	47	169	0	216	58	0	53	111	0	280	131	411	0	0	0	0	738
Percent	21.8	78.2	0.0		52.3	0.0	47.7		0.0	68.1	31.9		0.0	0.0	0.0		
05:00 Volume	9	52	0	61	16	0	15	31	0	66	38	104	0	0	0	0	196
Peak Factor																	0.941
High Int.	04:30 PM				05:00 PM				04:45 PM								
Volume	13	49	0	62	16	0	15	31	0	76	31	107					
Peak Factor	0.871								0.895				0.960				



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File Name : HillAlp
Site Code : 00000000
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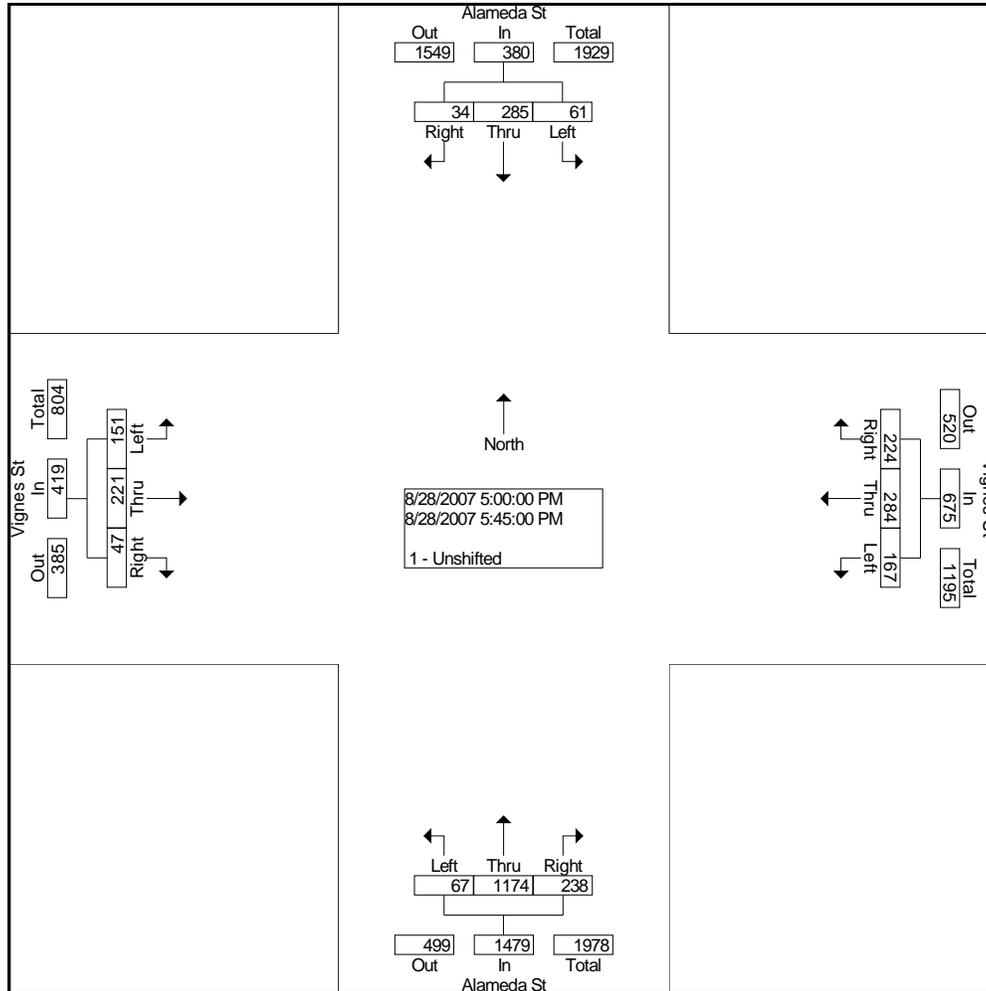
Start Time	Hill St Southbound				Alpine St Westbound				Hill St Northbound				Alpine St Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour From 12:00 PM to 05:45 PM - Peak 1 of 1																	
Intersection	04:30 PM																
Volume	111	1096	43	1250	38	158	96	292	28	1198	47	1273	120	196	20	336	3151
Percent	8.9	87.7	3.4		13.0	54.1	32.9		2.2	94.1	3.7		35.7	58.3	6.0		
04:30																	
Volume	19	330	12	361	6	35	32	73	5	311	11	327	30	38	5	73	834
Peak Factor	0.945																
High Int.	05:15 PM																
Volume	38	319	13	370	10	44	23	77	6	307	16	329	32	71	7	110	
Peak Factor	0.845				0.948				0.967				0.764				



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File Name : AlamVig
Site Code : 00000000
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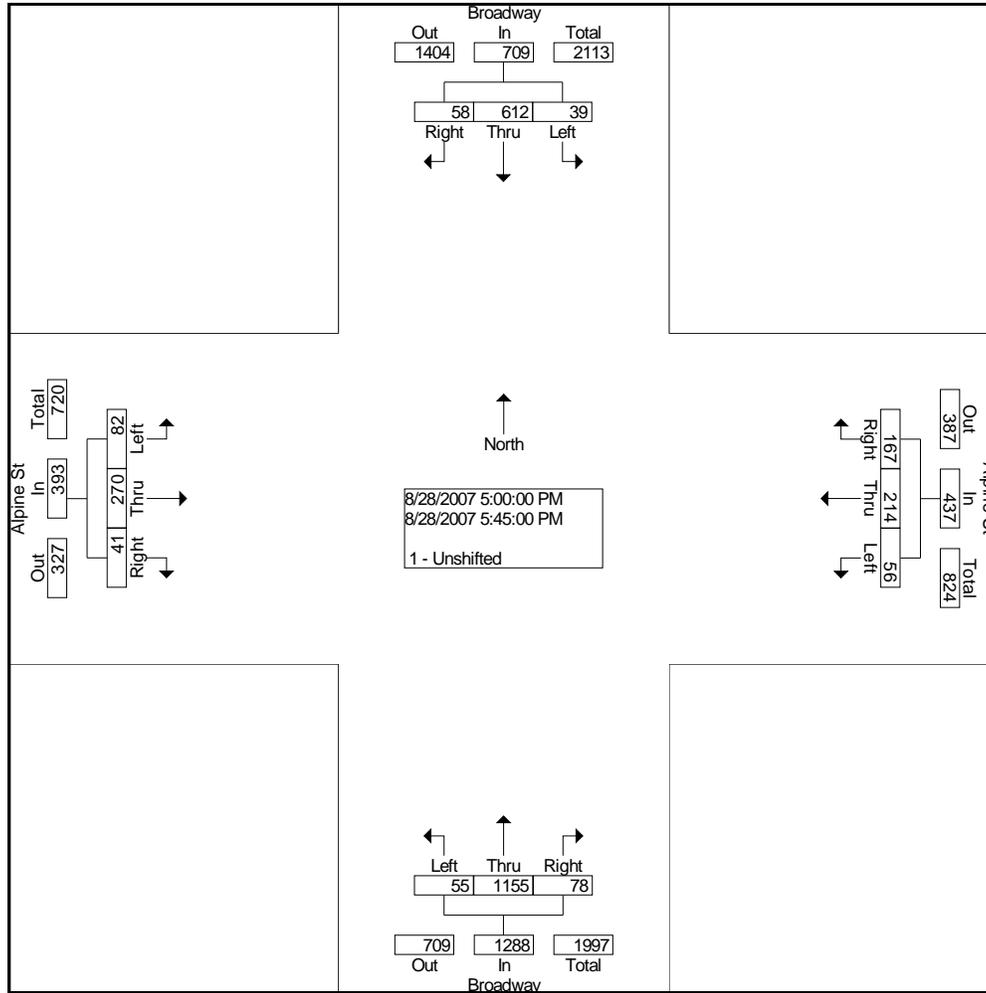
Start Time	Alameda St Southbound				Vignes St Westbound				Alameda St Northbound				Vignes St Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour From 12:00 PM to 05:45 PM - Peak 1 of 1																	
Intersection	05:00 PM																
Volume	61	285	34	380	167	284	224	675	67	1174	238	1479	151	221	47	419	2953
Percent	16.1	75.0	8.9		24.7	42.1	33.2		4.5	79.4	16.1		36.0	52.7	11.2		
05:30																	
Volume	11	68	9	88	49	63	57	169	15	324	65	404	28	62	11	101	762
Peak Factor	0.969																
High Int.	05:00 PM																
Volume	14	83	10	107	44	90	51	185	15	324	65	404	49	66	10	125	
Peak Factor	0.888				0.912				0.915				0.838				



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File Name : BroadALp
Site Code : 00000000
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Start Time	Broadway Southbound				Alpine St Westbound				Broadway Northbound				Alpine St Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour From 12:00 PM to 05:45 PM - Peak 1 of 1																	
Intersection	05:00 PM																
Volume	39	612	58	709	56	214	167	437	55	1155	78	1288	82	270	41	393	2827
Percent	5.5	86.3	8.2		12.8	49.0	38.2		4.3	89.7	6.1		20.9	68.7	10.4		
05:45																	
Volume	11	147	16	174	15	54	46	115	16	310	26	352	15	66	14	95	736
Peak Factor	0.960																
High Int.	05:00 PM																
Volume	10	170	16	196	12	62	45	119	16	310	26	352	16	79	11	106	
Peak Factor	0.904				0.918				0.915				0.927				



TRAFFIC COUNT SUMMARY

City of Los Angeles
Department of Transportation
(Rev Apr 92)

STREET:
North/South MAIN ST

East/West ALPINE ST/VIGNES ST

Day: TUESDAY Date: DEC 2, 1997 Weather: CLEAR

Hours: 7-10 AM 3-6 PM

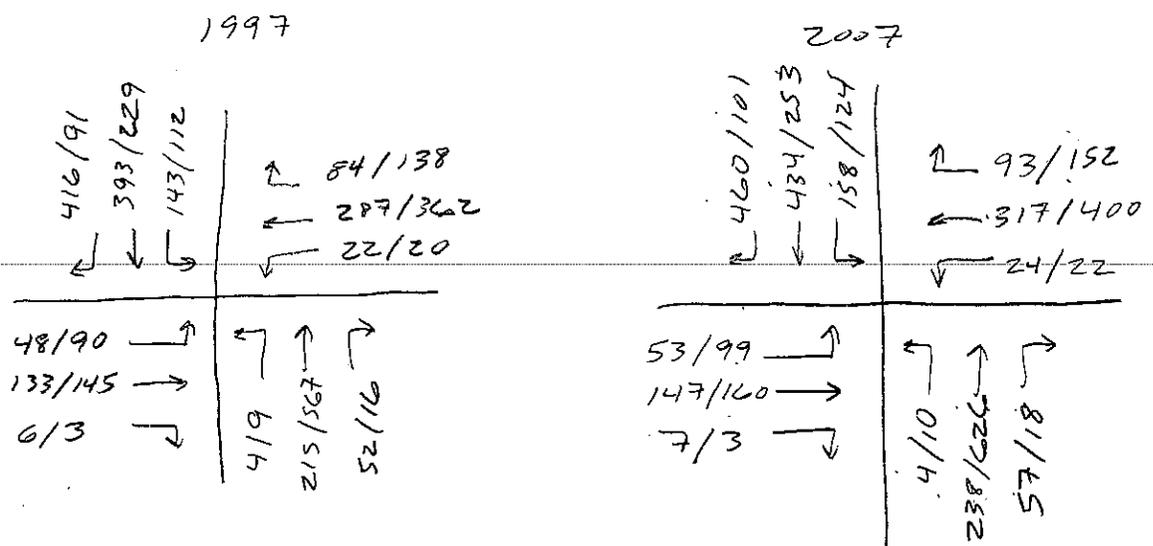
School Day: YES District: CENTRAL

	N/B	S/B	E/B	W/B
DUAL-WHEELED	165	173	31	138
BIKES	0	0	0	0
BUSES	24	24	6	12

	N/B TIME	S/B TIME	E/B TIME	W/B TIME
AM PK 15 MIN	89 8.45	310 8.15	67 7.45	122 9.15
PM PK 15 MIN	169 5.15	125 3.30	66 5.15	133 5.30
AM PK HOUR	271 8.00	1033 7.30	202 7.45	393 9.00
PM PK HOUR	596 4.45	443 3.15	238 5.00	520 5.00

NORTHBOUND Approach					SOUTHBOUND Approach					TOTAL		XING S/L		XING N/L	
Hours	Lt	Th	Rt	Total	Hours	Lt	Th	Rt	Total	N-S	Ped	Sch	Ped	Sch	
7-8	5	174	23	202	7-8	142	337	292	771	973	4	0	2	0	
8-9	4	215	52	271	8-9	143	393	416	952	1223	3	0	7	0	
9-10	12	162	33	207	9-10	94	273	148	515	722	3	0	5	0	
3-4	3	278	18	299	3-4	112	229	91	432	731	7	0	4	0	
4-5	10	428	19	457	4-5	84	228	101	413	870	10	0	7	0	
5-6	9	567	16	592	5-6	85	189	85	359	951	13	0	5	0	
TOTAL	43	1824	161	2028	TOTAL	660	1649	1133	3442	5470	40	0	30	0	

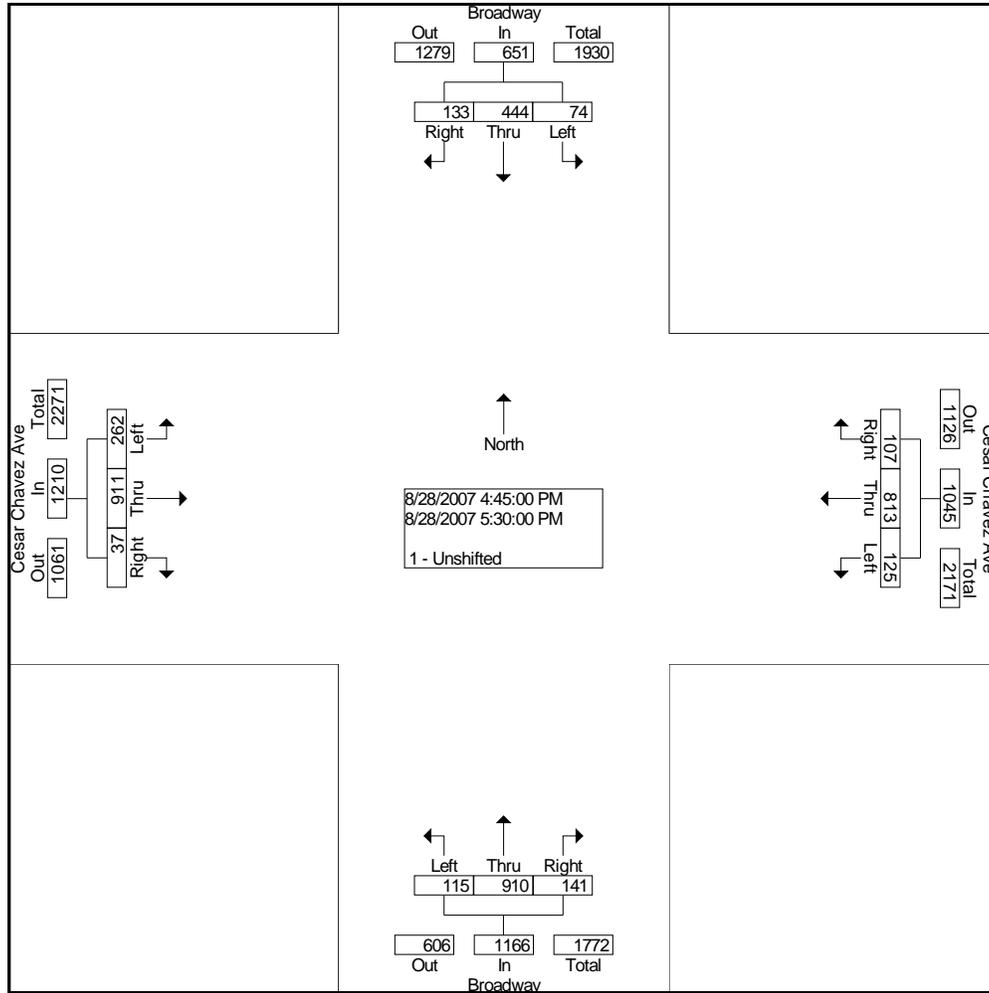
EASTBOUND Approach					WESTBOUND Approach					TOTAL		XING W/L		XING E/L	
Hours	Lt	Th	Rt	Total	Hours	Lt	Th	Rt	Total	E-W	Ped	Sch	Ped	Sch	
7-8	29	146	2	177	7-8	10	155	58	223	400	2	0	12	0	
8-9	40	132	3	175	8-9	12	209	100	321	496	1	0	10	0	
9-10	48	133	6	187	9-10	22	287	84	393	580	0	0	15	0	
3-4	56	116	8	180	3-4	26	318	101	445	625	1	0	16	2	
4-5	85	93	3	181	4-5	20	304	72	396	577	0	0	8	0	
5-6	90	145	3	238	5-6	20	362	138	520	758	0	0	5	0	
TOTAL	348	765	25	1138	TOTAL	110	1635	553	2298	3436	4	0	66	2	



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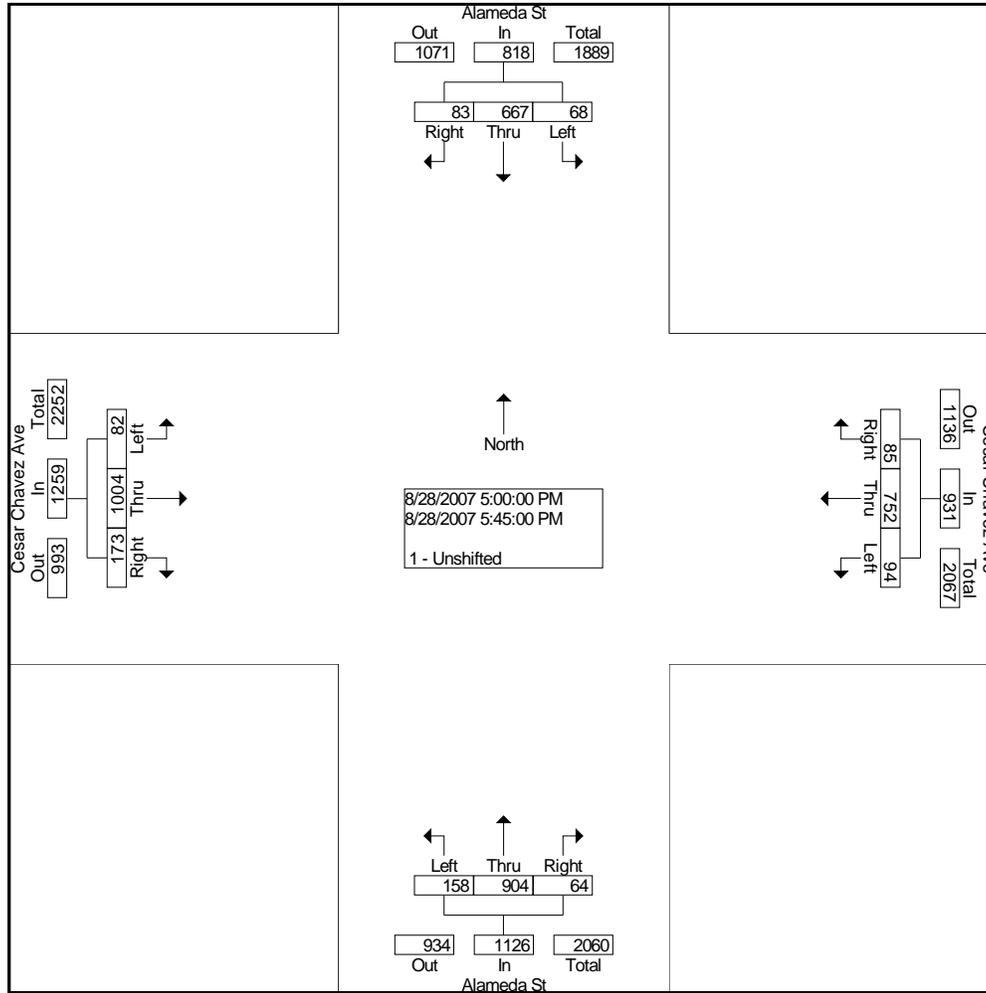
Start Time	Broadway Southbound				Cesar Chavez Ave Westbound				Broadway Northbound				Cesar Chavez Ave Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour From 12:00 PM to 05:45 PM - Peak 1 of 1																	
Intersection	04:45 PM																
Volume	74	444	133	651	125	813	107	1045	115	910	141	1166	262	911	37	1210	4072
Percent	11.4	68.2	20.4		12.0	77.8	10.2		9.9	78.0	12.1		21.7	75.3	3.1		
05:30	05:15 PM																
Volume	18	117	26	161	30	194	21	245	38	243	29	310	61	241	10	312	1028
Peak Factor	0.990																
High Int.	05:15 PM																
Volume	22	117	35	174	33	224	34	291	38	243	29	310	61	241	10	312	
Peak Factor	0.935																
								0.898				0.940					0.970



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Start Time	Alameda St Southbound				Cesar Chavez Ave Westbound				Alameda St Northbound				Cesar Chavez Ave Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour From 12:00 PM to 05:45 PM - Peak 1 of 1																	
Intersection	05:00 PM																
Volume	68	667	83	818	94	752	85	931	158	904	64	1126	82	1004	173	1259	4134
Percent	8.3	81.5	10.1		10.1	80.8	9.1		14.0	80.3	5.7		6.5	79.7	13.7		
05:45																	
Volume	18	154	17	189	33	241	17	291	42	242	21	305	23	231	43	297	1082
Peak Factor	0.955																
High Int.	05:00 PM																
Volume	16	185	24	225	33	241	17	291	42	242	21	305	17	276	47	340	
Peak Factor	0.909				0.800				0.923				0.926				

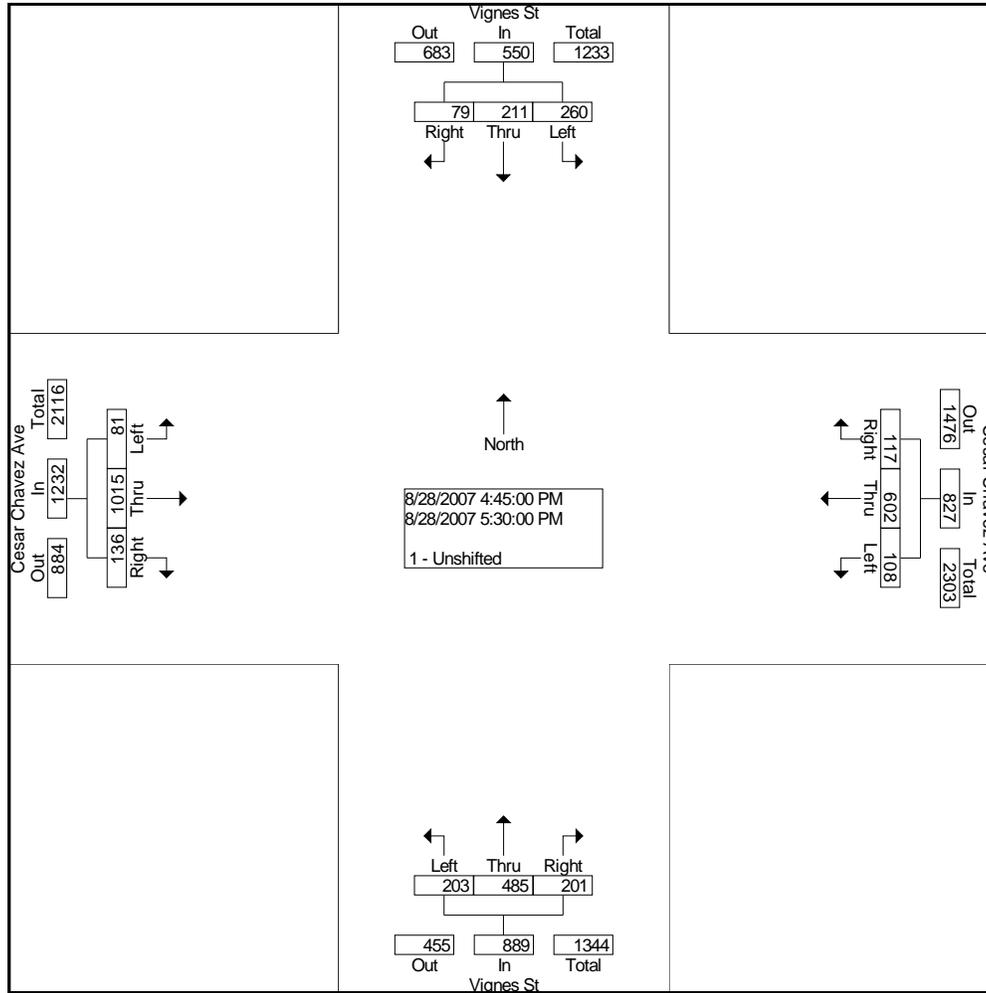


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 Site Code : 00000000
 Start Date : 8/28/2007
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Start Time	Vignes St Southbound				Cesar Chavez Ave Westbound				Vignes St Northbound				Cesar Chavez Ave Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour From 12:00 PM to 05:45 PM - Peak 1 of 1																	
Intersection	04:45 PM																
Volume	260	211	79	550	108	602	117	827	203	485	201	889	81	1015	136	1232	3498
Percent	47.3	38.4	14.4		13.1	72.8	14.1		22.8	54.6	22.6		6.6	82.4	11.0		
04:45																	
Volume	70	70	24	164	30	141	27	198	46	116	67	229	19	258	41	318	909
Peak Factor	0.962																
High Int.	05:30 PM																
Volume	70	70	24	164	27	164	40	231	59	127	50	236	17	267	44	328	
Peak Factor	0.838				0.895				0.942				0.939				

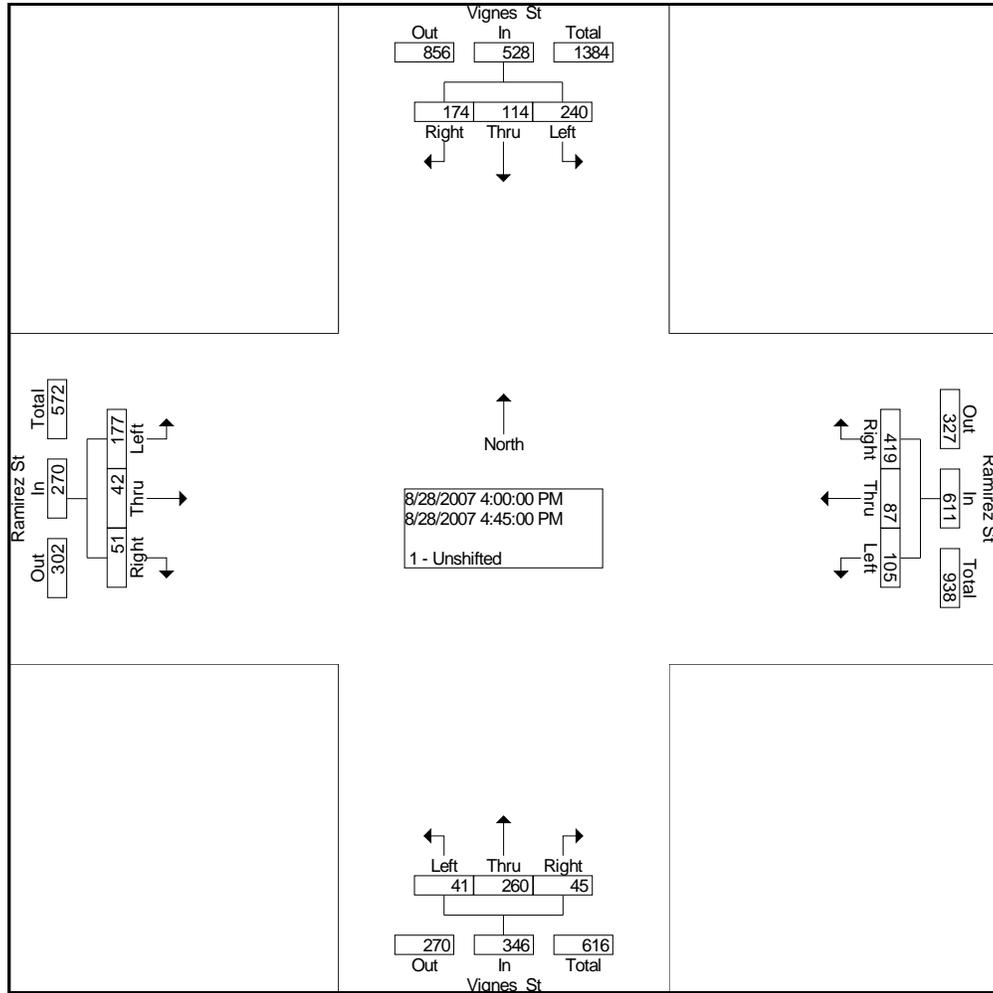


City Traffic Counters

626.256.4171

File Name : VigRam
 Site Code : 00000000
 Start Date : 8/28/2007
 Page No : 3

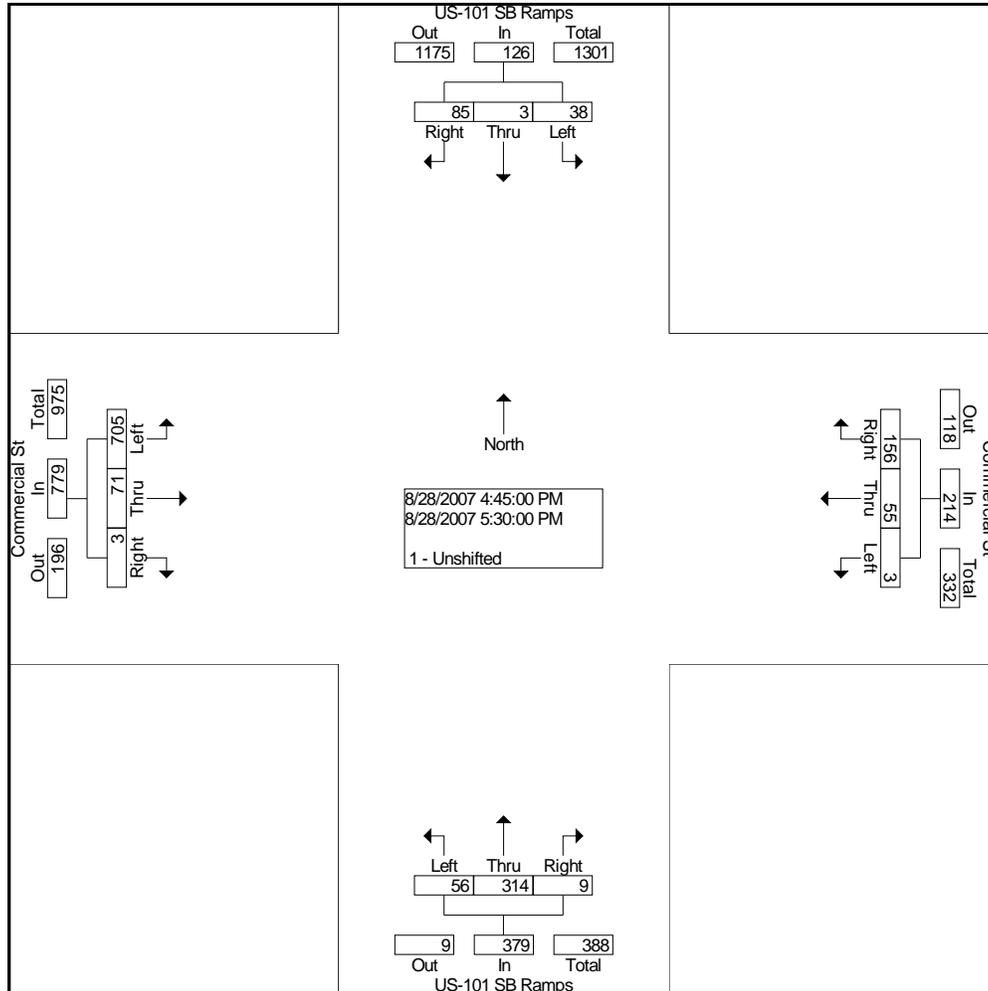
Start Time	Vignes St Southbound				Ramirez St Westbound				Vignes St Northbound				Ramirez St Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour From 12:00 PM to 05:45 PM - Peak 1 of 1																	
Intersection	04:00 PM																
Volume	240	114	174	528	105	87	419	611	41	260	45	346	177	42	51	270	1755
Percent	45.5	21.6	33.0		17.2	14.2	68.6		11.8	75.1	13.0		65.6	15.6	18.9		
04:15																	
Volume	58	31	47	136	43	32	126	201	6	62	15	83	50	14	23	87	507
Peak Factor																	
High Int.	04:45 PM																
Volume	74	31	41	146	43	32	126	201	17	72	14	103	50	14	23	87	0.865
Peak Factor	0.904				0.760				0.840				0.776				



City Traffic Counters
626.256.4171

File Name : 101SBComm
Site Code : 00000000
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Start Time	US-101 SB Ramps Southbound				Commercial St Westbound				US-101 SB Ramps Northbound				Commercial St Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour From 12:00 PM to 05:45 PM - Peak 1 of 1																	
Intersection	04:45 PM																
Volume	38	3	85	126	3	55	156	214	56	314	9	379	705	71	3	779	1498
Percent	30.2	2.4	67.5		1.4	25.7	72.9		14.8	82.8	2.4		90.5	9.1	0.4		
05:00	05:00 PM																
Volume	13	1	13	27	2	18	52	72	12	98	6	116	170	23	2	195	410
Peak Factor	0.913																
High Int.	05:30 PM																
Volume	11	0	34	45	2	18	52	72	12	98	6	116	197	15	0	212	
Peak Factor	0.700																
					0.743				0.817				0.919				

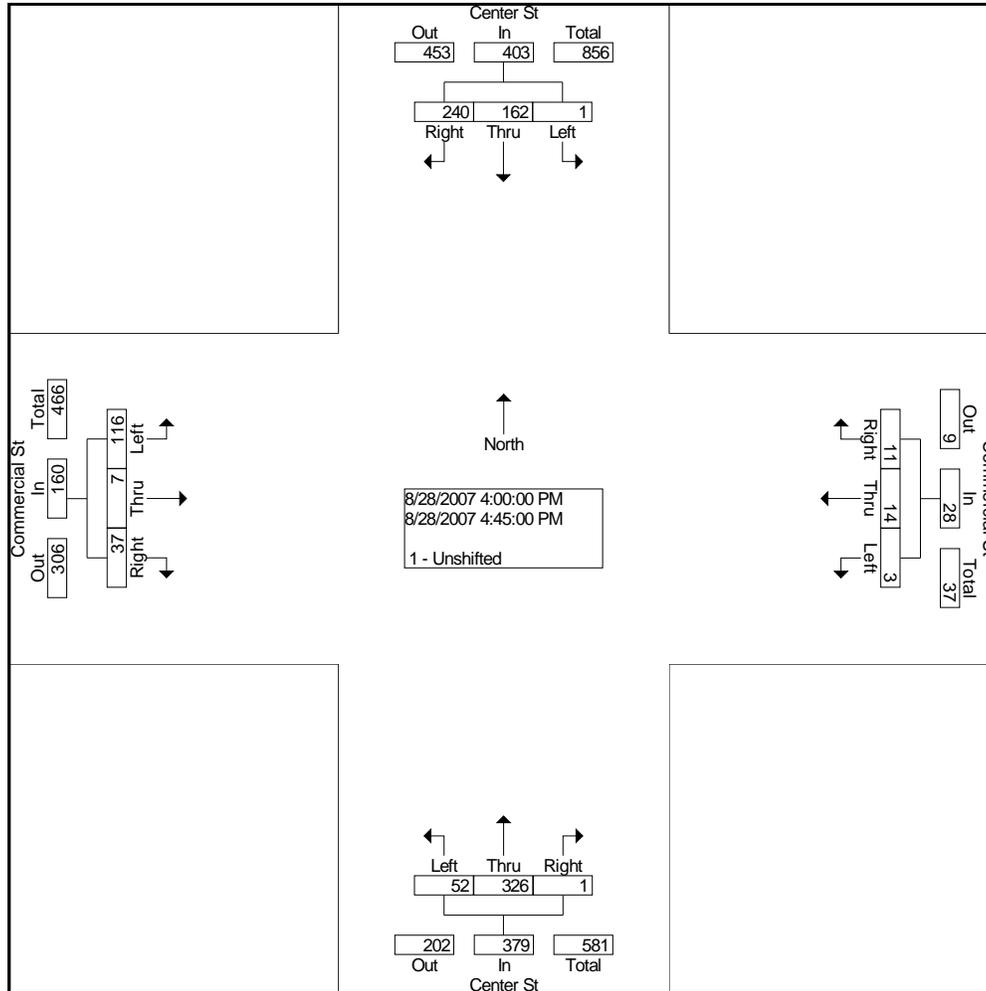


City Traffic Counters

626.256.4171

File Name : CenComm
 Site Code : 00000000
 Start Date : 8/28/2007
 Page No : 3

Start Time	Center St Southbound				Commercial St Westbound				Center St Northbound				Commercial St Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour From 12:00 PM to 05:45 PM - Peak 1 of 1																	
Intersection	04:00 PM																
Volume	1	162	240	403	3	14	11	28	52	326	1	379	116	7	37	160	970
Percent	0.2	40.2	59.6		10.7	50.0	39.3		13.7	86.0	0.3		72.5	4.4	23.1		
04:00																	
Volume	0	56	88	144	1	8	5	14	23	76	0	99	31	0	9	40	297
Peak Factor																	
High Int.	04:00 PM																
Volume	0	56	88	144	1	8	5	14	5	99	0	104	36	7	11	54	0.816
Peak Factor	0.700				0.500				0.911				0.741				



**APPENDIX C
LOS CALCULATION
WORKSHEETS**

EXISTING CONDITIONS

Scenario: Existing AM

Command: Existing AM

Volume: Existing AM

Geometry: Existing

Impact Fee: Default Impact Fee

Trip Generation: Project AM

Trip Distribution: No Cesar Chavez

Paths: Default Path

Routes: Default Route

Configuration: Existing AM

Intersection	Base	V/ C	Future		Change in
			Del/ Veh	V/ C	
# 1 Figueroa/I-110 NB On-Ramp at A	A	xxxxx 0.237	A	xxxxx 0.237	+ 0.000 V/C
# 2 Hill at Alpine	B	xxxxx 0.676	B	xxxxx 0.676	+ 0.000 V/C
# 3 Broadway at Alpine St	C	xxxxx 0.734	C	xxxxx 0.734	+ 0.000 V/C
# 4 Alameda at Vignes	A	xxxxx 0.581	A	xxxxx 0.581	+ 0.000 V/C
# 5 Main at Vignes	A	xxxxx 0.507	A	xxxxx 0.507	+ 0.000 V/C
# 6 Broadway at Cesar Chavez	C	xxxxx 0.781	C	xxxxx 0.781	+ 0.000 V/C
# 7 Alameda at Cesar Chavez	C	xxxxx 0.740	C	xxxxx 0.740	+ 0.000 V/C
# 8 Vignes at Cesar Chavez	C	xxxxx 0.714	C	xxxxx 0.714	+ 0.000 V/C
# 9 Vignes/US 101 WB Ramps at Rami	A	xxxxx 0.338	A	xxxxx 0.338	+ 0.000 V/C
# 10 Garey/US 101 SB Ramps at Comme	A	xxxxx 0.274	A	xxxxx 0.274	+ 0.000 V/C
# 11 Center at Commercial	A	9.2 0.315	A	9.2 0.315	+ 0.000 V/C

Level Of Service Computation Report

Level Of Service Computation Report

Existing AM Tue Jul 15, 2008 15:56:25 Page 3-1
Circular 212 Planning Method (Future Volume Alternative)

Existing AM Tue Jul 15, 2008 15:56:25 Page 4-1
Circular 212 Planning Method (Future Volume Alternative)

Intersection #1 Figueroa/I-110 NB On-Ramp at Alpine

Cycle (sec): 100 Critical Vol./Cap.(X): 0.237
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 24 Level Of Service: A

Street Name: Figueroa St/I-110 NB On-Ramp Alpine St
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
-----|-----|-----|-----|
Control: Permitted Permitted Split Phase Split Phase
Rights: Include Include Include Include
Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
Lanes: 1 1 0 1 0 0 0 0 0 0 0 0
-----|-----|-----|-----|
Volume Module:
Base Vol: 61 46 0 0 0 0 0 35 269 113 21 0
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 61 46 0 0 0 0 0 35 269 113 21 0
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 61 46 0 0 0 0 0 35 269 113 21 0
User Adj: 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95
PHF Adj: 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95
PHF Volume: 61 46 0 0 0 0 0 35 269 113 21 0
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 61 46 0 0 0 0 0 35 269 113 21 0
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.10 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.10 1.00 1.00 1.00
Final Volume: 67 46 0 0 0 0 0 35 296 113 21 0
-----|-----|-----|-----|
Saturation Flow Module:
Sat/Lane: 1425 1425 1425 1425 1425 1425 1425 1425 1425 1425 1425
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 1.78 1.22 0.00 0.00 0.00 0.00 0.00 0.21 1.79 0.84 0.16 0.00
Final Sat.: 2536 1739 0 0 0 0 0 301 2549 1202 223 0
-----|-----|-----|-----|
Capacity Analysis Module:
Vol/Sat: 0.03 0.03 0.00 0.00 0.00 0.00 0.12 0.12 0.09 0.09 0.00
Crit Volume: 38 0 165 134
Crit Moves: **** **

Intersection #2 Hill at Alpine

Cycle (sec): 100 Critical Vol./Cap.(X): 0.676
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 44 Level Of Service: B

Street Name: Hill St Alpine St
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
-----|-----|-----|-----|
Control: Permitted Permitted Permitted Permitted
Rights: Include Include Include Include
Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
Lanes: 1 0 1 1 0 1 0 1 1 0 0 1 0 1 0
-----|-----|-----|-----|
Volume Module:
Base Vol: 16 161 12 46 1491 47 20 105 19 133 252 32
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 16 161 12 46 1491 47 20 105 19 133 252 32
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 16 161 12 46 1491 47 20 105 19 133 252 32
User Adj: 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95
PHF Adj: 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95
PHF Volume: 16 161 12 46 1491 47 20 105 19 133 252 32
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 16 161 12 46 1491 47 20 105 19 133 252 32
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Volume: 16 161 12 46 1491 47 20 105 19 133 252 32
-----|-----|-----|-----|
Saturation Flow Module:
Sat/Lane: 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 1.00 1.86 0.14 1.00 1.94 0.06 0.28 1.46 0.26 0.64 1.21 0.15
Final Sat.: 1500 2792 208 1500 2908 92 417 2188 396 957 1813 230
-----|-----|-----|-----|
Capacity Analysis Module:
Vol/Sat: 0.01 0.06 0.06 0.03 0.51 0.51 0.05 0.05 0.05 0.14 0.14 0.14
Crit Volume: 16 769 20 209
Crit Moves: **** **

Level Of Service Computation Report

Level Of Service Computation Report

Existing AM Tue Jul 15, 2008 15:56:25 Page 5-1
Circular 212 Planning Method (Future Volume Alternative)

Existing AM Tue Jul 15, 2008 15:56:25 Page 6-1
Circular 212 Planning Method (Future Volume Alternative)

Intersection #3 Broadway at Alpine St

Cycle (sec): 100 Critical Vol./Cap.(X): 0.734
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 70 Level Of Service: C

Street Name: Broadway Alpine St
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
-----|-----|-----|-----|
Control: Prot+Permit Permitted Permitted Permitted
Rights: Include Include Include Include
Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
Lanes: 1 0 1 1 0 1 0 1 1 0 0 1 0 1 0
-----|-----|-----|-----|
Volume Module:
Base Vol: 24 312 39 82 1444 131 14 96 23 121 262 57
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 24 312 39 82 1444 131 14 96 23 121 262 57
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 24 312 39 82 1444 131 14 96 23 121 262 57
User Adj: 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95
PHF Adj: 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95
PHF Volume: 24 312 39 82 1444 131 14 96 23 121 262 57
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 24 312 39 82 1444 131 14 96 23 121 262 57
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 2.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Volume: 24 312 39 82 1444 131 28 96 23 121 262 57
-----|-----|-----|-----|
Saturation Flow Module:
Sat/Lane: 1425 1425 1425 1425 1425 1425 1425 1425 1425 1425 1425
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 1.00 1.78 0.22 1.00 1.83 0.17 0.24 1.45 0.31 0.55 1.19 0.26
Final Sat.: 1425 2533 317 1425 2613 237 335 2069 446 784 1697 369
-----|-----|-----|-----|
Capacity Analysis Module:
Vol/Sat: 0.02 0.12 0.12 0.06 0.55 0.55 0.04 0.05 0.05 0.15 0.15 0.15
Crit Volume: 24 788 14 220
Crit Moves: **** **** ****

Intersection #4 Alameda at Vignes

Cycle (sec): 100 Critical Vol./Cap.(X): 0.581
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 44 Level Of Service: A

Street Name: Alameda St Vignes St
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
-----|-----|-----|-----|
Control: Permitted Permitted Permitted Prot+Permit
Rights: Ovl Include Include Include
Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
Lanes: 1 0 2 0 1 1 0 2 1 0 1 0 1 1 0 1 0 2 0 1
-----|-----|-----|-----|
Volume Module:
Base Vol: 37 280 161 123 991 218 62 80 27 334 516 61
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 37 280 161 123 991 218 62 80 27 334 516 61
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 37 280 161 123 991 218 62 80 27 334 516 61
User Adj: 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95
PHF Adj: 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95
PHF Volume: 37 280 161 123 991 218 62 80 27 334 516 61
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 37 280 161 123 991 218 62 80 27 334 516 61
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Volume: 37 280 161 123 991 218 62 80 27 334 516 61
-----|-----|-----|-----|
Saturation Flow Module:
Sat/Lane: 1425 1425 1425 1425 1425 1425 1425 1425 1425 1425 1425
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 1.00 2.00 1.00 1.00 2.46 0.54 1.00 1.50 0.50 1.00 2.00 1.00
Final Sat.: 1425 2850 1425 1425 3504 771 1425 2131 719 1425 2850 1425
-----|-----|-----|-----|
Capacity Analysis Module:
Vol/Sat: 0.03 0.10 0.11 0.09 0.28 0.28 0.04 0.04 0.04 0.23 0.18 0.04
Crit Volume: 37 403 54 334
Crit Moves: **** **** ****

Level Of Service Computation Report

Level Of Service Computation Report

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Circular 212 Planning Method (Future Volume Alternative)

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Circular 212 Planning Method (Future Volume Alternative)

Intersection #5 Main at Vignes

Cycle (sec): 100 Critical Vol./Cap.(X): 0.507
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 38 Level Of Service: A

Street Name: Main St Vignes St
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
-----|-----|-----|-----|
Control: Permitted Permitted Protected Permitted
Rights: Include Include Include Include
Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
Lanes: 1 0 1 1 0 1 0 1 1 0 1 0 1 1 0
-----|-----|-----|-----|
Volume Module:
Base Vol: 4 238 57 158 434 460 53 147 7 24 317 93
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 4 238 57 158 434 460 53 147 7 24 317 93
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 4 238 57 158 434 460 53 147 7 24 317 93
User Adj: 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95
PHF Adj: 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95
PHF Volume: 4 238 57 158 434 460 53 147 7 24 317 93
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 4 238 57 158 434 460 53 147 7 24 317 93
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume: 4 238 57 158 434 460 53 147 7 24 317 93
-----|-----|-----|-----|
Saturation Flow Module:
Sat/Lane: 1425 1425 1425 1425 1425 1425 1425 1425 1425 1425 1425
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 1.00 1.61 0.39 1.00 1.00 1.00 1.00 1.91 0.09 1.00 1.55 0.45
Final Sat.: 1425 2299 551 1425 1425 1425 1425 2720 130 1425 2204 646
-----|-----|-----|-----|
Capacity Analysis Module:
Vol/Sat: 0.00 0.10 0.10 0.11 0.30 0.32 0.04 0.05 0.05 0.02 0.14 0.14
Crit Volume: 4 460 53 205
Crit Moves: **** **

Intersection #6 Broadway at Cesar Chavez

Cycle (sec): 100 Critical Vol./Cap.(X): 0.781
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 104 Level Of Service: C

Street Name: Broadway Cesar Chavez Ave
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
-----|-----|-----|-----|
Control: Prot+Permit Permitted Protected Protected
Rights: Include Include Include Include
Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
Lanes: 1 0 1 1 0 1 0 1 1 0 2 0 2 1 0 1 0 3 0 1
-----|-----|-----|-----|
Volume Module:
Base Vol: 87 382 162 141 885 262 104 691 71 133 1069 74
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 87 382 162 141 885 262 104 691 71 133 1069 74
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 87 382 162 141 885 262 104 691 71 133 1069 74
User Adj: 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95
PHF Adj: 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95
PHF Volume: 87 382 162 141 885 262 104 691 71 133 1069 74
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 87 382 162 141 885 262 104 691 71 133 1069 74
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.10 1.00 1.00 1.00 1.00 1.00
FinalVolume: 87 382 162 141 885 262 114 691 71 133 1069 74
-----|-----|-----|-----|
Saturation Flow Module:
Sat/Lane: 1375 1375 1375 1375 1375 1375 1375 1375 1375 1375 1375 1375
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 1.00 1.40 0.60 1.00 1.54 0.46 2.00 2.72 0.28 1.00 3.00 1.00
Final Sat.: 1375 1931 819 1375 2122 628 2750 3741 384 1375 4125 1375
-----|-----|-----|-----|
Capacity Analysis Module:
Vol/Sat: 0.06 0.20 0.20 0.10 0.42 0.42 0.04 0.18 0.18 0.10 0.26 0.05
Crit Volume: 87 574 57 356
Crit Moves: **** **

Level Of Service Computation Report

Level Of Service Computation Report

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Circular 212 Planning Method (Future Volume Alternative)

Existing AM Tue Jul 15, 2008 15:56:25 Page 10-1
Circular 212 Planning Method (Future Volume Alternative)

Intersection #7 Alameda at Cesar Chavez

Cycle (sec): 100 Critical Vol./Cap.(X): 0.740
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 88 Level Of Service: C

Street Name: Alameda St Cesar Chavez Ave
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
-----|-----|-----|-----|
Control: Prot+Permit Permitted Permitted Prot+Permit
Rights: Include Include Ovl Include
Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
Lanes: 1 0 2 0 1 1 0 2 1 0 1 0 2 1 0
-----|-----|-----|-----|
Volume Module:
Base Vol: 101 325 158 59 1162 209 59 568 113 175 1172 44
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 101 325 158 59 1162 209 59 568 113 175 1172 44
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 101 325 158 59 1162 209 59 568 113 175 1172 44
User Adj: 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95
PHF Adj: 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95
PHF Volume: 101 325 158 59 1162 209 59 568 113 175 1172 44
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 101 325 158 59 1162 209 59 568 113 175 1172 44
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Volume: 101 325 158 59 1162 209 59 568 113 175 1172 44
-----|-----|-----|-----|
Saturation Flow Module:
Sat/Lane: 1375 1375 1375 1375 1375 1375 1375 1375 1375 1375 1375 1375
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 1.00 2.00 1.00 1.00 2.54 0.46 1.00 2.00 1.00 1.00 2.89 0.11
Final Sat.: 1375 2750 1375 1375 3496 629 1375 2750 1375 1375 3976 149
-----|-----|-----|-----|
Capacity Analysis Module:
Vol/Sat: 0.07 0.12 0.11 0.04 0.33 0.33 0.04 0.21 0.08 0.13 0.29 0.29
Crit Volume: 101 457 284 175
Crit Moves: **** **** **** ****

Intersection #8 Vignes at Cesar Chavez

Cycle (sec): 100 Critical Vol./Cap.(X): 0.714
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 80 Level Of Service: C

Street Name: Vignes St Cesar Chavez Ave
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
-----|-----|-----|-----|
Control: Prot+Permit Prot+Permit Prot+Permit Prot+Permit
Rights: Ovl Ovl Ovl Ovl
Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
Lanes: 1 0 2 0 1 1 0 2 0 1 1 0 2 0 1
-----|-----|-----|-----|
Volume Module:
Base Vol: 143 245 77 111 267 53 128 453 138 251 1155 182
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 143 245 77 111 267 53 128 453 138 251 1155 182
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 143 245 77 111 267 53 128 453 138 251 1155 182
User Adj: 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95
PHF Adj: 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95
PHF Volume: 143 245 77 111 267 53 128 453 138 251 1155 182
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 143 245 77 111 267 53 128 453 138 251 1155 182
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Volume: 143 245 77 111 267 53 128 453 138 251 1155 182
-----|-----|-----|-----|
Saturation Flow Module:
Sat/Lane: 1375 1375 1375 1375 1375 1375 1375 1375 1375 1375 1375 1375
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 1.00 2.00 1.00 1.00 2.00 1.00 1.00 2.00 1.00 1.00 2.00 1.00
Final Sat.: 1375 2750 1375 1375 2750 1375 1375 2750 1375 1375 2750 1375
-----|-----|-----|-----|
Capacity Analysis Module:
Vol/Sat: 0.10 0.09 0.06 0.08 0.10 0.04 0.09 0.16 0.10 0.18 0.42 0.13
Crit Volume: 143 134 128 578
Crit Moves: **** **** **** ****

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Circular 212 Planning Method (Future Volume Alternative)

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Circular 212 Planning Method (Future Volume Alternative)

Intersection #9 Vignes/US 101 WB Ramps at Ramirez

Cycle (sec): 100 Critical Vol./Cap.(X): 0.338
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 34 Level Of Service: A

Street Name: Vignes St/US 101 WB Ramps Ramirez St
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
-----|-----|-----|-----|
Control: Protected Protected Split Phase Split Phase
Rights: Ignore Include Include Ovl
Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
Lanes: 2 0 2 0 1 2 0 1 1 0 1 1 0 1 0 1 1
-----|-----|-----|-----|
Volume Module:
Base Vol: 24 159 72 323 126 218 147 31 50 78 41 194
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 24 159 72 323 126 218 147 31 50 78 41 194
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 24 159 72 323 126 218 147 31 50 78 41 194
User Adj: 0.95 0.95 0.00 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95
PHF Adj: 0.95 0.95 0.00 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95
PHF Volume: 24 159 0 323 126 218 147 31 50 78 41 194
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 24 159 0 323 126 218 147 31 50 78 41 194
PCE Adj: 1.00 1.00 0.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.10 1.00 0.00 1.10 1.00 1.00 1.10 1.00 1.00 1.00 1.00 1.10
Final Volume: 26 159 0 355 126 218 162 31 50 78 41 213
-----|-----|-----|-----|
Saturation Flow Module:
Sat/Lane: 1375 1375 1375 1375 1375 1375 1375 1375 1375 1375 1375
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 2.00 2.00 1.00 2.00 1.00 1.00 2.00 0.38 0.62 1.00 0.32 1.68
Final Sat.: 2750 2750 1375 2750 1375 1375 2750 526 849 1375 443 2307
-----|-----|-----|-----|
Capacity Analysis Module:
Vol/Sat: 0.01 0.06 0.00 0.13 0.09 0.16 0.06 0.06 0.06 0.06 0.09 0.09
Crit Volume: 80 178 81 127
Crit Moves: **** **

Intersection #10 Garey/US 101 SB Ramps at Commercial

Cycle (sec): 100 Critical Vol./Cap.(X): 0.274
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 26 Level Of Service: A

Street Name: Garey St/US 101 SB Ramps Commercial St
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
-----|-----|-----|-----|
Control: Split Phase Split Phase Protected Permitted
Rights: Include Include Include Include
Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
Lanes: 0 1 0 1 0 0 1 0 0 1 2 0 0 1 0 1 0 1 1 0
-----|-----|-----|-----|
Volume Module:
Base Vol: 58 16 5 118 16 183 168 41 15 2 81 34
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 58 16 5 118 16 183 168 41 15 2 81 34
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 58 16 5 118 16 183 168 41 15 2 81 34
User Adj: 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95
PHF Adj: 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95
PHF Volume: 58 16 5 118 16 183 168 41 15 2 81 34
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 58 16 5 118 16 183 168 41 15 2 81 34
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.10 1.00 1.00 1.00 1.00 1.00
Final Volume: 58 16 5 118 16 183 185 41 15 2 81 34
-----|-----|-----|-----|
Saturation Flow Module:
Sat/Lane: 1425 1425 1425 1425 1425 1425 1425 1425 1425 1425 1425
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 1.00 0.87 0.13 0.88 0.12 1.00 2.00 0.73 0.27 1.00 1.41 0.59
Final Sat.: 1425 1245 180 1255 170 1425 2850 1043 382 1425 2007 843
-----|-----|-----|-----|
Capacity Analysis Module:
Vol/Sat: 0.04 0.01 0.03 0.09 0.09 0.13 0.06 0.04 0.04 0.00 0.04 0.04
Crit Volume: 58 183 92 58
Crit Moves: **** **

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 2000 HCM 4-Way Stop Method (Future Volume Alternative)

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 Intersection #11 Center at Commercial

 Cycle (sec): 100 Critical Vol./Cap.(X): 0.315
 Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 9.2
 Optimal Cycle: 0 Level Of Service: A

 Street Name: Center St Commercial St
 Approach: North Bound South Bound East Bound West Bound
 Movement: L - T - R L - T - R L - T - R L - T - R

 Control: Stop Sign Stop Sign Stop Sign Stop Sign
 Rights: Include Include Include Include
 Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
 Lanes: 1 0 1 0 1 1 0 1 0 1 0 0 1 0 0 0

 Volume Module:
 Base Vol: 23 143 3 8 208 111 87 7 31 1 17 7 7
 Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 Initial Bse: 23 143 3 8 208 111 87 7 31 1 17 7 7
 Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0 0
 PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0 0
 Initial Fut: 23 143 3 8 208 111 87 7 31 1 17 7 7
 User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 PHF Adj: 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95
 PHF Volume: 24 151 3 8 219 117 92 7 33 1 18 7 7
 Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0 0
 Reduced Vol: 24 151 3 8 219 117 92 7 33 1 18 7 7
 PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 FinalVolume: 24 151 3 8 219 117 92 7 33 1 18 7 7

 Saturation Flow Module:
 Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 Lanes: 1.00 1.00 1.00 1.00 1.00 1.00 0.69 0.06 0.25 0.04 0.68 0.28
 Final Sat.: 612 671 768 632 694 803 462 37 165 26 440 181

 Capacity Analysis Module:
 Vol/Sat: 0.04 0.22 0.00 0.01 0.32 0.15 0.20 0.20 0.20 0.04 0.04 0.04
 Crit Moves: **** **
 Delay/Veh: 8.6 9.4 7.2 8.3 10.0 7.8 9.2 9.2 9.2 8.3 8.3 8.3
 Delay Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 AdjDel/Veh: 8.6 9.4 7.2 8.3 10.0 7.8 9.2 9.2 9.2 8.3 8.3 8.3
 LOS by Move: A A A B A A A A A A
 ApproachDel: 9.2 9.2 9.2 9.2 9.2 9.2 9.2 9.2 9.2 8.3
 Delay Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 ApprAdjDel: 9.2 9.2 9.2 9.2 9.2 9.2 9.2 9.2 9.2 8.3
 LOS by Appr: A A A A A A A A A A
 AllWayAvgQ: 0.0 0.3 0.0 0.0 0.4 0.2 0.2 0.2 0.2 0.0 0.0 0.0

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

Scenario: Existing PM

Command: Existing PM
 Volume: Existing PM
 Geometry: Existing
 Impact Fee: Default Impact Fee
 Trip Generation: Project PM
 Trip Distribution: No Cesar Chavez
 Paths: Default Path
 Routes: Default Route
 Configuration: Existing PM

Intersection	Base		Future		Change in
	V/ C	LOS	Del/ Veh	V/ C	
# 1 Figueroa/I-110 NB On-Ramp at A	A xxxxx	0.272	A xxxxx	0.272	+ 0.000 V/C
# 2 Hill at Alpine	C xxxxx	0.701	C xxxxx	0.701	+ 0.000 V/C
# 3 Broadway at Alpine St	C xxxxx	0.727	C xxxxx	0.727	+ 0.000 V/C
# 4 Alameda at Vignes	C xxxxx	0.756	C xxxxx	0.756	+ 0.000 V/C
# 5 Main at Vignes	B xxxxx	0.606	B xxxxx	0.606	+ 0.000 V/C
# 6 Broadway at Cesar Chavez	C xxxxx	0.797	C xxxxx	0.797	+ 0.000 V/C
# 7 Alameda at Cesar Chavez	D xxxxx	0.854	D xxxxx	0.854	+ 0.000 V/C
# 8 Vignes at Cesar Chavez	D xxxxx	0.856	D xxxxx	0.856	+ 0.000 V/C
# 9 Vignes/US 101 WB Ramps at Rami	A xxxxx	0.485	A xxxxx	0.485	+ 0.000 V/C
# 10 Garey/US 101 SB Ramps at Comme	B xxxxx	0.604	B xxxxx	0.604	+ 0.000 V/C
# 11 Center at Commercial	B 11.5	0.536	B 11.5	0.536	+ 0.000 V/C

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Circular 212 Planning Method (Future Volume Alternative)

Intersection #1 Figueroa/I-110 NB On-Ramp at Alpine

Cycle (sec):	100	Critical Vol./Cap.(X):				0.272
Loss Time (sec):	0 (Y+R=4.0 sec)	Average Delay (sec/veh):				xxxxxx
Optimal Cycle:	26	Level Of Service:				A

Street Name:	Figueroa St/I-110 NB On-Ramp				Alpine St				
Approach:	North Bound		South Bound		East Bound		West Bound		
Movement:	L	T	R	L	T	R	L	T	R
Control:	Permitted		Permitted		Split Phase		Split Phase		
Rights:	Include		Include		Include		Include		
Min. Green:	0	0	0	0	0	0	0	0	0
Lanes:	1	1	0	1	0	0	1	0	0

Volume Module:

Base Vol:	131	280	0	0	0	0	47	169	58	53	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	131	280	0	0	0	0	47	169	58	53	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	131	280	0	0	0	0	47	169	58	53	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	138	295	0	0	0	0	49	178	61	56	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	138	295	0	0	0	0	49	178	61	56	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.10	1.00	1.00	1.00	1.00	1.00	1.10	1.00	1.00	1.00	1.00
FinalVolume:	152	295	0	0	0	0	49	196	61	56	0

Saturation Flow Module:

Sat/Lane:	1425	1425	1425	1425	1425	1425	1425	1425	1425	1425	1425
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.02	1.98	0.00	0.00	0.00	0.00	0.40	1.60	0.52	0.48	0.00
Final Sat.:	1453	2822	0	0	0	0	575	2275	745	680	0

Capacity Analysis Module:

Vol/Sat:	0.10	0.10	0.00	0.00	0.00	0.00	0.09	0.09	0.08	0.08	0.00
Crit Volume:	149						123	117			
Crit Moves:	****						****	****			

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Circular 212 Planning Method (Future Volume Alternative)

Intersection #2 Hill at Alpine

Cycle (sec):	100	Critical Vol./Cap.(X):				0.701
Loss Time (sec):	0 (Y+R=4.0 sec)	Average Delay (sec/veh):				xxxxxx
Optimal Cycle:	48	Level Of Service:				C

Street Name:	Hill St				Alpine St				
Approach:	North Bound		South Bound		East Bound		West Bound		
Movement:	L	T	R	L	T	R	L	T	R
Control:	Permitted		Permitted		Permitted		Permitted		
Rights:	Include		Include		Include		Include		
Min. Green:	0	0	0	0	0	0	0	0	0
Lanes:	1	0	1	1	0	0	1	0	1

Volume Module:

Base Vol:	28	1198	47	111	1096	43	120	196	20	38	158	96
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	28	1198	47	111	1096	43	120	196	20	38	158	96
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	28	1198	47	111	1096	43	120	196	20	38	158	96
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	29	1261	49	117	1154	45	126	206	21	40	166	101
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	29	1261	49	117	1154	45	126	206	21	40	166	101
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	29	1261	49	117	1154	45	126	206	21	40	166	101

Saturation Flow Module:

Sat/Lane:	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.92	0.08	1.00	1.92	0.08	0.71	1.17	0.12	0.26	1.08	0.66
Final Sat.:	1500	2887	113	1500	2887	113	1071	1750	179	390	1623	986

Capacity Analysis Module:

Vol/Sat:	0.02	0.44	0.44	0.08	0.40	0.40	0.12	0.12	0.12	0.10	0.10	0.10
Crit Volume:	655	117		126			154					
Crit Moves:	****	****		****			****					

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 Circular 212 Planning Method (Future Volume Alternative)

 Intersection #3 Broadway at Alpine St

 Cycle (sec): 100 Critical Vol./Cap.(X): 0.727
 Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
 Optimal Cycle: 68 Level Of Service: C

 Street Name: Broadway Alpine St
 Approach: North Bound South Bound East Bound West Bound
 Movement: L - T - R L - T - R L - T - R L - T - R
 Control: Prot+Permit Permitted Permitted Permitted
 Rights: Include Include Include Include
 Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
 Lanes: 1 0 1 1 0 1 0 1 1 0 0 1 0 1 0
 Volume Module:
 Base Vol: 55 1155 78 39 612 58 82 270 41 56 214 167
 Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 Initial Bse: 55 1155 78 39 612 58 82 270 41 56 214 167
 Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
 PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
 Initial Fut: 55 1155 78 39 612 58 82 270 41 56 214 167
 User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 PHF Adj: 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95
 PHF Volume: 58 1216 82 41 644 61 86 284 43 59 225 176
 Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
 Reduced Vol: 58 1216 82 41 644 61 86 284 43 59 225 176
 PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 2.00 1.00 1.00 2.00 1.00 1.00
 MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 Final Volume: 58 1216 82 41 644 61 173 284 43 118 225 176
 Saturation Flow Module:
 Sat/Lane: 1425 1425 1425 1425 1425 1425 1425 1425 1425 1425 1425
 Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 Lanes: 1.00 1.87 0.13 1.00 1.83 0.17 0.53 1.30 0.17 0.29 1.03 0.68
 Final Sat.: 1425 2670 180 1425 2603 247 751 1853 246 419 1466 965
 Capacity Analysis Module:
 Vol/Sat: 0.04 0.46 0.03 0.25 0.25 0.11 0.15 0.18 0.14 0.15 0.18
 Crit Volume: 649 41 86 259
 Crit Moves: **** **

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 Circular 212 Planning Method (Future Volume Alternative)

 Intersection #4 Alameda at Vignes

 Cycle (sec): 100 Critical Vol./Cap.(X): 0.756
 Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
 Optimal Cycle: 76 Level Of Service: C

 Street Name: Alameda St Vignes St
 Approach: North Bound South Bound East Bound West Bound
 Movement: L - T - R L - T - R L - T - R L - T - R
 Control: Permitted Permitted Permitted Prot+Permit
 Rights: Ovl Include Include Include
 Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
 Lanes: 1 0 2 0 1 1 0 2 1 0 1 0 1 1 0 1 0 2 0 1
 Volume Module:
 Base Vol: 67 1174 238 61 285 34 151 221 47 167 284 224
 Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 Initial Bse: 67 1174 238 61 285 34 151 221 47 167 284 224
 Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
 PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
 Initial Fut: 67 1174 238 61 285 34 151 221 47 167 284 224
 User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 PHF Adj: 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95
 PHF Volume: 71 1236 251 64 300 36 159 233 49 176 299 236
 Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
 Reduced Vol: 71 1236 251 64 300 36 159 233 49 176 299 236
 PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 Final Volume: 71 1236 251 64 300 36 159 233 49 176 299 236
 Saturation Flow Module:
 Sat/Lane: 1425 1425 1425 1425 1425 1425 1425 1425 1425 1425 1425
 Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 Lanes: 1.00 2.00 1.00 1.00 2.68 0.32 1.00 1.65 0.35 1.00 2.00 1.00
 Final Sat.: 1425 2850 1425 1425 3819 456 1425 2350 500 1425 2850 1425
 Capacity Analysis Module:
 Vol/Sat: 0.05 0.43 0.18 0.05 0.08 0.08 0.11 0.10 0.10 0.12 0.10 0.17
 Crit Volume: 618 64 159 236
 Crit Moves: **** **

Level Of Service Computation Report

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Circular 212 Planning Method (Future Volume Alternative)

Intersection #5 Main at Vignes

Cycle (sec): 100 Critical Vol./Cap.(X): 0.606
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 47 Level Of Service: B

Street Name: Main St Vignes St
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R

Control: Permitted Permitted Protected Permitted
Rights: Include Include Include Include
Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
Lanes: 1 0 1 1 0 1 0 1 1 0 1 0 1 1 0

Volume Module:
Base Vol: 10 626 18 124 253 101 99 160 3 22 400 152
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 10 626 18 124 253 101 99 160 3 22 400 152
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 10 626 18 124 253 101 99 160 3 22 400 152
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95
PHF Volume: 11 659 19 131 266 106 104 168 3 23 421 160
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 11 659 19 131 266 106 104 168 3 23 421 160
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Volume: 11 659 19 131 266 106 104 168 3 23 421 160

Saturation Flow Module:
Sat/Lane: 1425 1425 1425 1425 1425 1425 1425 1425 1425 1425 1425
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 1.00 1.94 0.06 1.00 1.43 0.57 1.00 1.96 0.04 1.00 1.45 0.55
Final Sat.: 1425 2770 80 1425 2037 813 1425 2798 52 1425 2065 785

Capacity Analysis Module:
Vol/Sat: 0.01 0.24 0.24 0.09 0.13 0.13 0.07 0.06 0.06 0.02 0.20 0.20
Crit Volume: 339 131 104 291
Crit Moves: **** **

Level Of Service Computation Report

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Circular 212 Planning Method (Future Volume Alternative)

Intersection #6 Broadway at Cesar Chavez

Cycle (sec): 100 Critical Vol./Cap.(X): 0.797
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 112 Level Of Service: C

Street Name: Broadway Cesar Chavez Ave
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R

Control: Prot+Permit Permitted Protected Protected
Rights: Include Include Include Include
Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
Lanes: 1 0 1 1 0 1 0 1 1 0 2 0 2 1 0 1 0 3 0 1

Volume Module:
Base Vol: 115 910 141 74 444 133 262 911 37 125 813 107
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 115 910 141 74 444 133 262 911 37 125 813 107
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 115 910 141 74 444 133 262 911 37 125 813 107
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95
PHF Volume: 121 958 148 78 467 140 276 959 39 132 856 113
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 121 958 148 78 467 140 276 959 39 132 856 113
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.10 1.00 1.00 1.00 1.00 1.00
Final Volume: 121 958 148 78 467 140 303 959 39 132 856 113

Saturation Flow Module:
Sat/Lane: 1375 1375 1375 1375 1375 1375 1375 1375 1375 1375 1375 1375
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 1.00 1.73 0.27 1.00 1.54 0.46 2.00 2.88 0.12 1.00 3.00 1.00
Final Sat.: 1375 2381 369 1375 2116 634 2750 3964 161 1375 4125 1375

Capacity Analysis Module:
Vol/Sat: 0.09 0.40 0.40 0.06 0.22 0.22 0.11 0.24 0.24 0.10 0.21 0.08
Crit Volume: 533 78 333 132
Crit Moves: **** **

Level Of Service Computation Report

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Circular 212 Planning Method (Future Volume Alternative)

Intersection #7 Alameda at Cesar Chavez

Cycle (sec):	100	Critical Vol./Cap.(X):				0.854
Loss Time (sec):	0 (Y+R=4.0 sec)	Average Delay (sec/veh):				xxxxxx
Optimal Cycle:	157	Level Of Service:				D

Street Name:	Alameda St				Cesar Chavez Ave				
Approach:	North Bound		South Bound		East Bound		West Bound		
Movement:	L	T	R	L	T	R	L	T	R
Control:	Prot+Permit		Permitted		Permitted		Prot+Permit		
Rights:	Include		Include		Ovl		Include		
Min. Green:	0	0	0	0	0	0	0	0	0
Lanes:	1	0	2	0	1	1	0	2	0

Volume Module:

Base Vol:	158	904	64	68	667	83	82	1004	173	94	752	85
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	158	904	64	68	667	83	82	1004	173	94	752	85
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	158	904	64	68	667	83	82	1004	173	94	752	85
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	166	952	67	72	702	87	86	1057	182	99	792	89
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	166	952	67	72	702	87	86	1057	182	99	792	89
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Volume:	166	952	67	72	702	87	86	1057	182	99	792	89

Saturation Flow Module:

Sat/Lane:	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.00	1.00	1.00	2.67	0.33	1.00	2.00	1.00	1.00	2.70	0.30
Final Sat.:	1375	2750	1375	1375	3669	457	1375	2750	1375	1375	3706	419

Capacity Analysis Module:

Vol/Sat:	0.12	0.35	0.05	0.05	0.19	0.19	0.06	0.38	0.13	0.07	0.21	0.21
Crit Volume:	476	72	528	99	528	99	528	99	528	99	528	99
Crit Moves:	****	****	****	****	****	****	****	****	****	****	****	****

Level Of Service Computation Report

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Circular 212 Planning Method (Future Volume Alternative)

Intersection #8 Vignes at Cesar Chavez

Cycle (sec):	100	Critical Vol./Cap.(X):				0.856
Loss Time (sec):	0 (Y+R=4.0 sec)	Average Delay (sec/veh):				xxxxxx
Optimal Cycle:	158	Level Of Service:				D

Street Name:	Vignes St				Cesar Chavez Ave				
Approach:	North Bound		South Bound		East Bound		West Bound		
Movement:	L	T	R	L	T	R	L	T	R
Control:	Prot+Permit		Prot+Permit		Prot+Permit		Prot+Permit		
Rights:	Ovl		Ovl		Ovl		Ovl		
Min. Green:	0	0	0	0	0	0	0	0	0
Lanes:	1	0	2	0	1	1	0	2	0

Volume Module:

Base Vol:	203	485	201	260	211	79	81	1015	136	108	602	117
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	203	485	201	260	211	79	81	1015	136	108	602	117
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	203	485	201	260	211	79	81	1015	136	108	602	117
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	214	511	212	274	222	83	85	1068	143	114	634	123
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	214	511	212	274	222	83	85	1068	143	114	634	123
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Volume:	214	511	212	274	222	83	85	1068	143	114	634	123

Saturation Flow Module:

Sat/Lane:	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.00	1.00	1.00	2.00	1.00	1.00	2.00	1.00	1.00	2.00	1.00
Final Sat.:	1375	2750	1375	1375	2750	1375	1375	2750	1375	1375	2750	1375

Capacity Analysis Module:

Vol/Sat:	0.16	0.19	0.15	0.20	0.08	0.06	0.06	0.39	0.10	0.08	0.23	0.09
Crit Volume:	255	274	534	114	255	274	534	114	255	274	534	114
Crit Moves:	****	****	****	****	****	****	****	****	****	****	****	****

Level Of Service Computation Report

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Circular 212 Planning Method (Future Volume Alternative)

Intersection #9 Vignes/US 101 WB Ramps at Ramirez

Cycle (sec): 100 Critical Vol./Cap.(X): 0.485
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 44 Level Of Service: A

Street Name: Vignes St/US 101 WB Ramps Ramirez St
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
-----|-----|-----|-----|
Control: Protected Protected Split Phase Split Phase
Rights: Ignore Include Include Ovl
Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
Lanes: 2 0 2 0 1 2 0 1 1 0 1 1 0 1 0 1 1
-----|-----|-----|-----|
Volume Module:
Base Vol: 41 260 45 240 114 174 177 42 51 105 87 419
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 41 260 45 240 114 174 177 42 51 105 87 419
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 41 260 45 240 114 174 177 42 51 105 87 419
User Adj: 1.00 1.00 0.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 0.95 0.95 0.00 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95
PHF Volume: 43 274 0 253 120 183 186 44 54 111 92 441
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 43 274 0 253 120 183 186 44 54 111 92 441
PCE Adj: 1.00 1.00 0.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.10 1.00 0.00 1.10 1.00 1.00 1.10 1.00 1.00 1.00 1.00 1.10
Final Volume: 47 274 0 278 120 183 205 44 54 111 92 485
-----|-----|-----|-----|
Saturation Flow Module:
Sat/Lane: 1375 1375 1375 1375 1375 1375 1375 1375 1375 1375 1375
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 2.00 2.00 1.00 2.00 1.00 1.00 2.00 0.45 0.55 1.00 0.32 1.68
Final Sat.: 2750 2750 1375 2750 1375 1375 2750 621 754 1375 437 2313
-----|-----|-----|-----|
Capacity Analysis Module:
Vol/Sat: 0.02 0.10 0.00 0.10 0.09 0.13 0.07 0.07 0.07 0.08 0.21 0.21
Crit Volume: 137 139 102 288
Crit Moves: **** **

Level Of Service Computation Report

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Circular 212 Planning Method (Future Volume Alternative)

Intersection #10 Garey/US 101 SB Ramps at Commercial

Cycle (sec): 100 Critical Vol./Cap.(X): 0.604
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 47 Level Of Service: B

Street Name: Garey St/US 101 SB Ramps Commercial St
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
-----|-----|-----|-----|
Control: Split Phase Split Phase Protected Permitted
Rights: Include Include Include Include
Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
Lanes: 0 1 0 1 0 0 1 0 0 1 2 0 0 1 0 1 0 1 1 0
-----|-----|-----|-----|
Volume Module:
Base Vol: 56 314 9 38 3 85 705 71 3 3 55 156
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 56 314 9 38 3 85 705 71 3 3 55 156
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 56 314 9 38 3 85 705 71 3 3 55 156
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95
PHF Volume: 59 331 9 40 3 89 742 75 3 3 58 164
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 59 331 9 40 3 89 742 75 3 3 58 164
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.10 1.00 1.00 1.00 1.00 1.00
Final Volume: 59 331 9 40 3 89 816 75 3 3 58 164
-----|-----|-----|-----|
Saturation Flow Module:
Sat/Lane: 1425 1425 1425 1425 1425 1425 1425 1425 1425 1425 1425
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 0.29 1.66 0.05 0.93 0.07 1.00 2.00 0.96 0.04 1.00 1.00 1.00
Final Sat.: 421 2361 68 1321 104 1425 2850 1367 58 1425 1425 1425
-----|-----|-----|-----|
Capacity Analysis Module:
Vol/Sat: 0.14 0.14 0.14 0.03 0.03 0.06 0.29 0.05 0.05 0.00 0.04 0.12
Crit Volume: 199 89 408 164
Crit Moves: **** **

Level Of Service Computation Report

Existing PM Tue Jul 15, 2008 15:57:23 Page 13-1
 2000 HCM 4-Way Stop Method (Future Volume Alternative)

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*****
Intersection #11 Center at Commercial
*****
Cycle (sec):      100          Critical Vol./Cap.(X):      0.536
Loss Time (sec):  0 (Y+R=4.0 sec) Average Delay (sec/veh):  11.5
Optimal Cycle:    0          Level Of Service:      B
*****
Street Name:      Center St          Commercial St
Approach:         North Bound       South Bound       East Bound       West Bound
Movement:         L - T - R       L - T - R       L - T - R       L - T - R
-----|-----|-----|-----|
Control:          Stop Sign       Stop Sign       Stop Sign       Stop Sign
Rights:           Include        Include        Include        Include
Min. Green:       0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Lanes:            1 0 1 0 1 1 0 1 0 1 0 0 0 0 1 0 0
-----|-----|-----|-----|
Volume Module:
Base Vol:         52 326 1 1 162 240 116 7 37 3 14 11
Growth Adj:      1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse:     52 326 1 1 162 240 116 7 37 3 14 11
Added Vol:       0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol:    0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut:     52 326 1 1 162 240 116 7 37 3 14 11
User Adj:        1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj:         0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95
PHF Volume:     55 343 1 1 171 253 122 7 39 3 15 12
Reduct Vol:      0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol:    55 343 1 1 171 253 122 7 39 3 15 12
PCE Adj:         1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj:         1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume:    55 343 1 1 171 253 122 7 39 3 15 12
-----|-----|-----|-----|
Saturation Flow Module:
Adjustment:      1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes:           1.00 1.00 1.00 1.00 1.00 1.00 0.73 0.04 0.23 0.11 0.50 0.39
Final Sat.:     585 641 725 583 637 728 422 25 135 58 272 214
-----|-----|-----|-----|
Capacity Analysis Module:
Vol/Sat:         0.09 0.54 0.00 0.00 0.27 0.35 0.29 0.29 0.29 0.05 0.05 0.05
Crit Moves:      ****          ****          ****          ****
Delay/Veh:       9.3 14.1 7.5 8.7 10.1 9.9 10.9 10.9 10.9 9.1 9.1 9.1
Delay Adj:       1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh:     9.3 14.1 7.5 8.7 10.1 9.9 10.9 10.9 10.9 9.1 9.1 9.1
LOS by Move:     A B A A B A B B A A A
ApproachDel:    13.4 10.0 10.9 9.1
Delay Adj:       1.00 1.00 1.00 1.00
ApprAdjDel:     13.4 10.0 10.9 9.1
LOS by Appr:    B B B A
AllWayAvgQ:     0.1 1.1 0.0 0.0 0.3 0.5 0.3 0.3 0.3 0.0 0.0 0.0
*****
    
```

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

**FUTURE WITHOUT PROJECT
CONDITIONS**

Scenario: Future AM

Command: Future AM
 Volume: Future AM
 Geometry: Existing
 Impact Fee: Default Impact Fee
 Trip Generation: Project PM
 Trip Distribution: No Cesar Chavez
 Paths: Default Path
 Routes: Default Route
 Configuration: Future AM

Intersection	Base	Future		Change in
		V/ C	Del/ Veh C	
# 1 Figueroa/I-110 NB On-Ramp at A	A xxxxx 0.370	A xxxxx 0.370	+ 0.000	V/C
# 2 Hill at Alpine	C xxxxx 0.765	C xxxxx 0.765	+ 0.000	V/C
# 3 Broadway at Alpine St	C xxxxx 0.775	C xxxxx 0.775	+ 0.000	V/C
# 4 Alameda at Vignes	B xxxxx 0.625	B xxxxx 0.625	+ 0.000	V/C
# 5 Main at Vignes	A xxxxx 0.535	A xxxxx 0.535	+ 0.000	V/C
# 6 Broadway at Cesar Chavez	D xxxxx 0.864	D xxxxx 0.864	+ 0.000	V/C
# 7 Alameda at Cesar Chavez	D xxxxx 0.817	D xxxxx 0.817	+ 0.000	V/C
# 8 Vignes at Cesar Chavez	C xxxxx 0.765	C xxxxx 0.765	+ 0.000	V/C
# 9 Vignes/US 101 WB Ramps at Rami	A xxxxx 0.350	A xxxxx 0.350	+ 0.000	V/C
# 10 Garey/US 101 SB Ramps at Comme	A xxxxx 0.321	A xxxxx 0.321	+ 0.000	V/C
# 11 Center at Commercial	A 9.1 0.306	A 9.1 0.306	+ 0.000	V/C

Level Of Service Computation Report

Level Of Service Computation Report

Future AM Tue Jul 15, 2008 15:57:58 Page 3-1
Circular 212 Planning Method (Future Volume Alternative)

Future AM Tue Jul 15, 2008 15:57:58 Page 4-1
Circular 212 Planning Method (Future Volume Alternative)

Intersection #1 Figueroa/I-110 NB On-Ramp at Alpine

Cycle (sec): 100 Critical Vol./Cap.(X): 0.370
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 30 Level Of Service: A

Street Name: Figueroa St/I-110 NB On-Ramp Alpine St
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
-----|-----|-----|-----|
Control: Permitted Permitted Split Phase Split Phase
Rights: Include Include Include Include
Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
Lanes: 1 1 0 1 0 0 0 0 0 0 0 0
-----|-----|-----|-----|
Volume Module:
Base Vol: 65 410 0 0 0 0 0 0 36 289 124 21 0
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 65 410 0 0 0 0 0 0 36 289 124 21 0
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 65 410 0 0 0 0 0 0 36 289 124 21 0
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 65 410 0 0 0 0 0 0 36 289 124 21 0
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 65 410 0 0 0 0 0 0 36 289 124 21 0
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.10 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.10 1.00 1.00 1.00
FinalVolume: 72 410 0 0 0 0 0 0 36 318 124 21 0
-----|-----|-----|-----|
Saturation Flow Module:
Sat/Lane: 1425 1425 1425 1425 1425 1425 1425 1425 1425 1425 1425
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 1.00 2.00 0.00 0.00 0.00 0.00 0.00 0.20 1.80 0.86 0.14 0.00
Final Sat.: 1425 2850 0 0 0 0 0 0 290 2560 1219 206 0
-----|-----|-----|-----|
Capacity Analysis Module:
Vol/Sat: 0.05 0.14 0.00 0.00 0.00 0.00 0.12 0.12 0.10 0.10 0.00
Crit Volume: 205 0 177 145
Crit Moves: **** **

Intersection #2 Hill at Alpine

Cycle (sec): 100 Critical Vol./Cap.(X): 0.765
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 61 Level Of Service: C

Street Name: Hill St Alpine St
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
-----|-----|-----|-----|
Control: Permitted Permitted Permitted Permitted
Rights: Include Include Include Include
Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
Lanes: 1 0 1 1 0 1 0 1 1 0 0 1 0 1 0
-----|-----|-----|-----|
Volume Module:
Base Vol: 16 280 12 47 1741 48 20 107 19 136 266 33
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 16 280 12 47 1741 48 20 107 19 136 266 33
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 16 280 12 47 1741 48 20 107 19 136 266 33
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 16 280 12 47 1741 48 20 107 19 136 266 33
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 16 280 12 47 1741 48 20 107 19 136 266 33
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume: 16 280 12 47 1741 48 20 107 19 136 266 33
-----|-----|-----|-----|
Saturation Flow Module:
Sat/Lane: 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 1.00 1.92 0.08 1.00 1.95 0.05 0.27 1.47 0.26 0.63 1.22 0.15
Final Sat.: 1500 2877 123 1500 2920 80 411 2199 390 938 1834 228
-----|-----|-----|-----|
Capacity Analysis Module:
Vol/Sat: 0.01 0.10 0.10 0.03 0.60 0.60 0.05 0.05 0.05 0.15 0.14 0.14
Crit Volume: 16 895 20 217
Crit Moves: **** **

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Circular 212 Planning Method (Future Volume Alternative)

Intersection #3 Broadway at Alpine St

Cycle (sec): 100 Critical Vol./Cap.(X): 0.775
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 83 Level Of Service: C

Street Name: Broadway Alpine St
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
-----|-----|-----|-----|
Control: Prot+Permit Permitted Permitted Permitted
Rights: Include Include Include Include
Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
Lanes: 1 0 1 1 0 1 0 1 1 0 0 1 0 1 0
-----|-----|-----|-----|
Volume Module:
Base Vol: 24 325 40 103 1536 143 14 98 23 123 267 65
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 24 325 40 103 1536 143 14 98 23 123 267 65
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 24 325 40 103 1536 143 14 98 23 123 267 65
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 24 325 40 103 1536 143 14 98 23 123 267 65
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 24 325 40 103 1536 143 14 98 23 123 267 65
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 2.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Volume: 24 325 40 103 1536 143 28 98 23 123 267 65
-----|-----|-----|-----|
Saturation Flow Module:
Sat/Lane: 1425 1425 1425 1425 1425 1425 1425 1425 1425 1425 1425
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 1.00 1.78 0.22 1.00 1.83 0.17 0.23 1.46 0.31 0.54 1.17 0.29
Final Sat.: 1425 2538 312 1425 2607 243 330 2080 440 770 1672 407
-----|-----|-----|-----|
Capacity Analysis Module:
Vol/Sat: 0.02 0.13 0.13 0.07 0.59 0.59 0.04 0.05 0.05 0.16 0.16 0.16
Crit Volume: 24 840 14 228
Crit Moves: **** **** ****

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Circular 212 Planning Method (Future Volume Alternative)

Intersection #4 Alameda at Vignes

Cycle (sec): 100 Critical Vol./Cap.(X): 0.625
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 50 Level Of Service: B

Street Name: Alameda St Vignes St
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
-----|-----|-----|-----|
Control: Permitted Permitted Permitted Prot+Permit
Rights: Ovl Include Include Include
Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
Lanes: 1 0 2 0 1 1 0 2 1 0 1 0 1 1 0 1 0 2 0 1
-----|-----|-----|-----|
Volume Module:
Base Vol: 45 426 164 125 1114 222 63 83 37 341 526 62
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 45 426 164 125 1114 222 63 83 37 341 526 62
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 45 426 164 125 1114 222 63 83 37 341 526 62
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 45 426 164 125 1114 222 63 83 37 341 526 62
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 45 426 164 125 1114 222 63 83 37 341 526 62
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Volume: 45 426 164 125 1114 222 63 83 37 341 526 62
-----|-----|-----|-----|
Saturation Flow Module:
Sat/Lane: 1425 1425 1425 1425 1425 1425 1425 1425 1425 1425 1425
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 1.00 2.00 1.00 1.00 2.50 0.50 1.00 1.38 0.62 1.00 2.00 1.00
Final Sat.: 1425 2850 1425 1425 3565 710 1425 1971 879 1425 2850 1425
-----|-----|-----|-----|
Capacity Analysis Module:
Vol/Sat: 0.03 0.15 0.12 0.09 0.31 0.31 0.04 0.04 0.04 0.24 0.18 0.04
Crit Volume: 45 445 60 341
Crit Moves: **** **** ****

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Circular 212 Planning Method (Future Volume Alternative)

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Circular 212 Planning Method (Future Volume Alternative)

Intersection #5 Main at Vignes

Cycle (sec): 100 Critical Vol./Cap.(X): 0.535
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 40 Level Of Service: A

Street Name: Main St Vignes St
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
-----|-----|-----|-----|
Control: Permitted Permitted Protected Permitted
Rights: Include Include Include Include
Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
Lanes: 1 0 1 1 0 1 0 1 1 0 1 0 1 1 0
-----|-----|-----|-----|
Volume Module:
Base Vol: 4 296 58 174 521 469 54 151 7 24 323 96
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 4 296 58 174 521 469 54 151 7 24 323 96
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 4 296 58 174 521 469 54 151 7 24 323 96
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 4 296 58 174 521 469 54 151 7 24 323 96
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 4 296 58 174 521 469 54 151 7 24 323 96
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Volume: 4 296 58 174 521 469 54 151 7 24 323 96
-----|-----|-----|-----|
Saturation Flow Module:
Sat/Lane: 1425 1425 1425 1425 1425 1425 1425 1425 1425 1425 1425
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 1.00 1.67 0.33 1.00 1.05 0.95 1.00 1.91 0.09 1.00 1.54 0.46
Final Sat.: 1425 2383 467 1425 1500 1350 1425 2724 126 1425 2197 653
-----|-----|-----|-----|
Capacity Analysis Module:
Vol/Sat: 0.00 0.12 0.12 0.12 0.35 0.35 0.04 0.06 0.06 0.02 0.15 0.15
Crit Volume: 4 495 54 210
Crit Moves: **** **** **** ****

Intersection #6 Broadway at Cesar Chavez

Cycle (sec): 100 Critical Vol./Cap.(X): 0.864
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 167 Level Of Service: D

Street Name: Broadway Cesar Chavez Ave
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
-----|-----|-----|-----|
Control: Prot+Permit Permitted Protected Protected
Rights: Include Include Include Include
Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
Lanes: 1 0 1 1 0 1 0 1 1 0 2 0 2 1 0 1 0 3 0 1
-----|-----|-----|-----|
Volume Module:
Base Vol: 113 439 248 144 966 267 113 732 72 190 1147 75
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 113 439 248 144 966 267 113 732 72 190 1147 75
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 113 439 248 144 966 267 113 732 72 190 1147 75
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 113 439 248 144 966 267 113 732 72 190 1147 75
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 113 439 248 144 966 267 113 732 72 190 1147 75
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.10 1.00 1.00 1.00 1.00 1.00
Final Volume: 113 439 248 144 966 267 124 732 72 190 1147 75
-----|-----|-----|-----|
Saturation Flow Module:
Sat/Lane: 1375 1375 1375 1375 1375 1375 1375 1375 1375 1375 1375 1375
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 1.00 1.28 0.72 1.00 1.57 0.43 2.00 2.73 0.27 1.00 3.00 1.00
Final Sat.: 1375 1757 993 1375 2155 595 2750 3756 369 1375 4125 1375
-----|-----|-----|-----|
Capacity Analysis Module:
Vol/Sat: 0.08 0.25 0.25 0.10 0.45 0.45 0.05 0.19 0.19 0.14 0.28 0.05
Crit Volume: 113 617 268 190
Crit Moves: **** **** **** ****

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Circular 212 Planning Method (Future Volume Alternative)

Intersection #7 Alameda at Cesar Chavez

Cycle (sec): 100 Critical Vol./Cap.(X): 0.817
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 124 Level Of Service: D

Street Name: Alameda St Cesar Chavez Ave
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
-----|-----|-----|-----|
Control: Prot+Permit Permitted Permitted Prot+Permit
Rights: Include Include Ovl Include
Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
Lanes: 1 0 2 0 1 1 0 2 1 0 1 0 2 1 0
-----|-----|-----|-----|
Volume Module:
Base Vol: 118 372 162 65 1219 213 60 697 118 179 1284 49
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 118 372 162 65 1219 213 60 697 118 179 1284 49
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 118 372 162 65 1219 213 60 697 118 179 1284 49
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 118 372 162 65 1219 213 60 697 118 179 1284 49
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 118 372 162 65 1219 213 60 697 118 179 1284 49
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Volume: 118 372 162 65 1219 213 60 697 118 179 1284 49
-----|-----|-----|-----|
Saturation Flow Module:
Sat/Lane: 1375 1375 1375 1375 1375 1375 1375 1375 1375 1375 1375 1375
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 1.00 2.00 1.00 1.00 2.55 0.45 1.00 2.00 1.00 1.00 2.89 0.11
Final Sat.: 1375 2750 1375 1375 3511 614 1375 2750 1375 1375 3973 152
-----|-----|-----|-----|
Capacity Analysis Module:
Vol/Sat: 0.09 0.14 0.12 0.05 0.35 0.35 0.04 0.25 0.09 0.13 0.32 0.32
Crit Volume: 118 477 348 179
Crit Moves: **** **** **** ****

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Circular 212 Planning Method (Future Volume Alternative)

Intersection #8 Vignes at Cesar Chavez

Cycle (sec): 100 Critical Vol./Cap.(X): 0.765
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 97 Level Of Service: C

Street Name: Vignes St Cesar Chavez Ave
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
-----|-----|-----|-----|
Control: Prot+Permit Prot+Permit Prot+Permit Prot+Permit
Rights: Ovl Ovl Ovl Ovl
Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
Lanes: 1 0 2 0 1 1 0 2 0 1 1 0 2 0 1
-----|-----|-----|-----|
Volume Module:
Base Vol: 146 263 79 119 272 54 133 600 141 256 1275 187
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 146 263 79 119 272 54 133 600 141 256 1275 187
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 146 263 79 119 272 54 133 600 141 256 1275 187
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 146 263 79 119 272 54 133 600 141 256 1275 187
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 146 263 79 119 272 54 133 600 141 256 1275 187
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Volume: 146 263 79 119 272 54 133 600 141 256 1275 187
-----|-----|-----|-----|
Saturation Flow Module:
Sat/Lane: 1375 1375 1375 1375 1375 1375 1375 1375 1375 1375 1375 1375
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 1.00 2.00 1.00 1.00 2.00 1.00 1.00 2.00 1.00 1.00 2.00 1.00
Final Sat.: 1375 2750 1375 1375 2750 1375 1375 2750 1375 1375 2750 1375
-----|-----|-----|-----|
Capacity Analysis Module:
Vol/Sat: 0.11 0.10 0.06 0.09 0.10 0.04 0.10 0.22 0.10 0.19 0.46 0.14
Crit Volume: 146 136 133 638
Crit Moves: **** **** **** ****

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Circular 212 Planning Method (Future Volume Alternative)

Intersection #9 Vignes/US 101 WB Ramps at Ramirez

Cycle (sec):	100	Critical Vol./Cap.(X):	0.350
Loss Time (sec):	0 (Y+R=4.0 sec)	Average Delay (sec/veh):	xxxxxxx
Optimal Cycle:	35	Level Of Service:	A

Street Name:	Vignes St/US 101 WB Ramps	Ramirez St		
Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Protected	Protected	Split Phase	Split Phase
Rights:	Ignore	Include	Include	Ovl
Min. Green:	0 0 0	0 0 0	0 0 0	0 0 0
Lanes:	2 0 2 0 1	2 0 1 1 0	1 1 0 1 0	1 0 0 1 1

Volume Module:

Base Vol:	24	168	73	329	129	222	150	32	51	80	42	205
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	24	168	73	329	129	222	150	32	51	80	42	205
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	24	168	73	329	129	222	150	32	51	80	42	205
User Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	24	168	0	329	129	222	150	32	51	80	42	205
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	24	168	0	329	129	222	150	32	51	80	42	205
PCE Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.10	1.00	0.00	1.10	1.00	1.00	1.10	1.00	1.00	1.00	1.00	1.10
Final Volume:	26	168	0	362	129	222	165	32	51	80	42	226

Saturation Flow Module:

Sat/Lane:	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	2.00	2.00	1.00	2.00	1.00	1.00	2.00	0.39	0.61	1.00	0.31	1.69
Final Sat.:	2750	2750	1375	2750	1375	1375	2750	530	845	1375	432	2318

Capacity Analysis Module:

Vol/Sat:	0.01	0.06	0.00	0.13	0.09	0.16	0.06	0.06	0.06	0.06	0.10	0.10
Crit Volume:	84	181		83	134							
Crit Moves:	****	****		****	****							

Level Of Service Computation Report

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Circular 212 Planning Method (Future Volume Alternative)

Intersection #10 Garey/US 101 SB Ramps at Commercial

Cycle (sec):	100	Critical Vol./Cap.(X):	0.321
Loss Time (sec):	0 (Y+R=4.0 sec)	Average Delay (sec/veh):	xxxxxxx
Optimal Cycle:	27	Level Of Service:	A

Street Name:	Garey St/US 101 SB Ramps	Commercial St		
Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Split Phase	Split Phase	Protected	Permitted
Rights:	Include	Include	Include	Include
Min. Green:	0 0 0	0 0 0	0 0 0	0 0 0
Lanes:	0 1 0 1 0	0 1 0 0 1	2 0 0 1 0	1 0 1 1 0

Volume Module:

Base Vol:	59	16	5	129	16	187	278	42	15	2	83	35
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	59	16	5	129	16	187	278	42	15	2	83	35
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	59	16	5	129	16	187	278	42	15	2	83	35
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	59	16	5	129	16	187	278	42	15	2	83	35
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	59	16	5	129	16	187	278	42	15	2	83	35
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.10	1.00	1.00	1.00	1.00	1.00
Final Volume:	59	16	5	129	16	187	306	42	15	2	83	35

Saturation Flow Module:

Sat/Lane:	1425	1425	1425	1425	1425	1425	1425	1425	1425	1425	1425	1425
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	0.88	0.12	0.89	0.11	1.00	2.00	0.74	0.26	1.00	1.41	0.59
Final Sat.:	1425	1247	178	1268	157	1425	2850	1050	375	1425	2005	845

Capacity Analysis Module:

Vol/Sat:	0.04	0.01	0.03	0.10	0.10	0.13	0.11	0.04	0.04	0.00	0.04	0.04
Crit Volume:	59	187	153									59
Crit Moves:	****	****	****	****	****	****	****	****	****	****	****	****

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 2000_BCM_4-Way_Stop_Method_(Future_Volume_Alternative)

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*****
Intersection #11 Center at Commercial
*****
Cycle (sec):          100          Critical Vol./Cap.(X):          0.306
Loss Time (sec):      0 (Y+R=4.0 sec)  Average Delay (sec/veh):          9.1
Optimal Cycle:        0          Level Of Service:          A
*****
Street Name:          Center St          Commercial St
Approach:             North Bound        South Bound        East Bound        West Bound
Movement:             L - T - R          L - T - R          L - T - R          L - T - R
-----|-----|-----|-----|
Control:              Stop Sign          Stop Sign          Stop Sign          Stop Sign
Rights:               Include            Include            Include            Include
Min. Green:           0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Lanes:                1 0 1 0 1 1 0 1 0 1 0 0 1 0 0 0
-----|-----|-----|-----|
Volume Module:
Base Vol:             23 147 3 8 212 113 95 7 35 1 17 7
Growth Adj:           1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse:          23 147 3 8 212 113 95 7 35 1 17 7
Added Vol:             0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol:          0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut:          23 147 3 8 212 113 95 7 35 1 17 7
User Adj:             1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj:              1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume:           23 147 3 8 212 113 95 7 35 1 17 7
Reduct Vol:           0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol:          23 147 3 8 212 113 95 7 35 1 17 7
PCE Adj:              1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj:              1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume:          23 147 3 8 212 113 95 7 35 1 17 7
-----|-----|-----|-----|
Saturation Flow Module:
Adjustment:           1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes:                1.00 1.00 1.00 1.00 1.00 1.00 0.69 0.05 0.26 0.04 0.68 0.28
Final Sat.:           613 671 768 632 694 800 464 34 171 26 442 182
-----|-----|-----|-----|
Capacity Analysis Module:
Vol/Sat:              0.04 0.22 0.00 0.01 0.31 0.14 0.20 0.20 0.20 0.04 0.04 0.04
Crit Moves:           ****          ****          ****
Delay/Veh:            8.6 9.3 7.2 8.3 9.9 7.8 9.2 9.2 9.2 8.3 8.3 8.3
Delay Adj:            1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh:           8.6 9.3 7.2 8.3 9.9 7.8 9.2 9.2 9.2 8.3 8.3 8.3
LOS by Move:          A A A A A A A A A A A
ApproachDel:          9.2 9.2 9.2 9.2 9.2 9.2 9.2 9.2 9.2 8.3
Delay Adj:            1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
ApprAdjDel:           9.2 9.2 9.2 9.2 9.2 9.2 9.2 9.2 9.2 8.3
LOS by Appr:          A A A A A A A A A A
AllWayAvgQ:           0.0 0.3 0.0 0.0 0.4 0.2 0.2 0.2 0.2 0.0 0.0 0.0
*****
    
```

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

Scenario: Future PM

Command: Future PM
 Volume: Future PM
 Geometry: Existing
 Impact Fee: Default Impact Fee
 Trip Generation: Project PM
 Trip Distribution: No Cesar Chavez
 Paths: Default Path
 Routes: Default Route
 Configuration: Future PM

Intersection	Base		Future		Change in
	V/ C	LOS	Del/ Veh	V/ C	
# 1 Figueroa/I-110 NB On-Ramp at A	A xxxxx	0.402	A xxxxx	0.402	+ 0.000 V/C
# 2 Hill at Alpine	C xxxxx	0.740	C xxxxx	0.740	+ 0.000 V/C
# 3 Broadway at Alpine St	C xxxxx	0.723	C xxxxx	0.723	+ 0.000 V/C
# 4 Alameda at Vignes	C xxxxx	0.788	C xxxxx	0.788	+ 0.000 V/C
# 5 Main at Vignes	B xxxxx	0.625	B xxxxx	0.625	+ 0.000 V/C
# 6 Broadway at Cesar Chavez	E xxxxx	0.920	E xxxxx	0.920	+ 0.000 V/C
# 7 Alameda at Cesar Chavez	D xxxxx	0.896	D xxxxx	0.896	+ 0.000 V/C
# 8 Vignes at Cesar Chavez	D xxxxx	0.888	D xxxxx	0.888	+ 0.000 V/C
# 9 Vignes/US 101 WB Ramps at Rami	A xxxxx	0.470	A xxxxx	0.470	+ 0.000 V/C
# 10 Garey/US 101 SB Ramps at Comme	B xxxxx	0.660	B xxxxx	0.660	+ 0.000 V/C
# 11 Center at Commercial	B 11.2	0.518	B 11.2	0.518	+ 0.000 V/C

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Circular 212 Planning Method (Future Volume Alternative)

Intersection #1 Figueroa/I-110 NB On-Ramp at Alpine

Intersection #2 Hill at Alpine

Cycle (sec): 100 Critical Vol./Cap.(X): 0.402
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 31 Level Of Service: A

Cycle (sec): 100 Critical Vol./Cap.(X): 0.740
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 55 Level Of Service: C

Street Name: Figueroa St/I-110 NB On-Ramp Alpine St
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
Control: Permitted Permitted Split Phase Split Phase
Rights: Include Include Include Include
Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
Lanes: 1 1 0 1 0 0 0 0 0 0 1 0 1 0 1 0 0 0 0

Street Name: Hill St Alpine St
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
Control: Permitted Permitted Permitted Permitted
Rights: Include Include Include Include
Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
Lanes: 1 0 1 1 0 1 0 1 1 0 0 1 0 1 0 0 1 0 1 0

Volume Module:
Base Vol: 148 662 0 0 0 0 0 0 48 179 66 54 0 0
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 148 662 0 0 0 0 0 0 48 179 66 54 0 0
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 148 662 0 0 0 0 0 0 48 179 66 54 0 0
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 148 662 0 0 0 0 0 0 48 179 66 54 0 0
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 148 662 0 0 0 0 0 0 48 179 66 54 0 0
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.10 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.10 1.00 1.00 1.00 1.00
FinalVolume: 163 662 0 0 0 0 0 0 48 197 66 54 0 0

Volume Module:
Base Vol: 29 1351 48 113 1569 44 122 200 20 39 168 98
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 29 1351 48 113 1569 44 122 200 20 39 168 98
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 29 1351 48 113 1569 44 122 200 20 39 168 98
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 29 1351 48 113 1569 44 122 200 20 39 168 98
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 29 1351 48 113 1569 44 122 200 20 39 168 98
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume: 29 1351 48 113 1569 44 122 200 20 39 168 98

Saturation Flow Module:
Sat/Lane: 1425 1425 1425 1425 1425 1425 1425 1425 1425 1425 1425
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 1.00 2.00 0.00 0.00 0.00 0.00 0.00 0.39 1.61 0.55 0.45 0.00
Final Sat.: 1425 2850 0 0 0 0 0 0 559 2291 784 641 0

Saturation Flow Module:
Sat/Lane: 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 1.00 1.93 0.07 1.00 1.95 0.05 0.71 1.17 0.12 0.26 1.10 0.64
Final Sat.: 1500 2897 103 1500 2918 82 1070 1754 175 384 1652 964

Capacity Analysis Module:
Vol/Sat: 0.11 0.23 0.00 0.00 0.00 0.00 0.00 0.09 0.09 0.08 0.08 0.00
Crit Volume: 331 0 122 120
Crit Moves: ****

Capacity Analysis Module:
Vol/Sat: 0.02 0.47 0.47 0.08 0.54 0.54 0.11 0.11 0.11 0.10 0.10 0.10
Crit Volume: 29 807 122 152
Crit Moves: ****

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Circular 212 Planning Method (Future Volume Alternative)

Intersection #3 Broadway at Alpine St

Cycle (sec): 100 Critical Vol./Cap.(X): 0.723
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 67 Level Of Service: C

Street Name: Broadway Alpine St
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
-----|-----|-----|-----|
Control: Prot+Permit Permitted Permitted Permitted
Rights: Include Include Include Include
Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
Lanes: 1 0 1 1 0 1 0 1 1 0 0 1 0 1 0
-----|-----|-----|-----|
Volume Module:
Base Vol: 56 1191 80 54 687 66 84 275 42 57 218 181
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 56 1191 80 54 687 66 84 275 42 57 218 181
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 56 1191 80 54 687 66 84 275 42 57 218 181
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 56 1191 80 54 687 66 84 275 42 57 218 181
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 56 1191 80 54 687 66 84 275 42 57 218 181
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 2.00 1.00 1.00 2.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Volume: 56 1191 80 54 687 66 168 275 42 114 218 181
-----|-----|-----|-----|
Saturation Flow Module:
Sat/Lane: 1425 1425 1425 1425 1425 1425 1425 1425 1425 1425 1425 1425
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 1.00 1.87 0.13 1.00 1.82 0.18 0.53 1.30 0.17 0.29 1.01 0.70
Final Sat.: 1425 2671 179 1425 2600 250 755 1848 247 407 1437 1006
-----|-----|-----|-----|
Capacity Analysis Module:
Vol/Sat: 0.04 0.45 0.45 0.04 0.26 0.26 0.11 0.15 0.17 0.14 0.15 0.18
Crit Volume: 636 54 84 256
Crit Moves: **** **

Intersection #4 Alameda at Vignes

Cycle (sec): 100 Critical Vol./Cap.(X): 0.788
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 88 Level Of Service: C

Street Name: Alameda St Vignes St
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
-----|-----|-----|-----|
Control: Permitted Permitted Permitted Prot+Permit
Rights: Ovl Include Include Include
Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
Lanes: 1 0 2 0 1 1 0 2 1 0 1 0 1 1 0 1 0 2 0 1
-----|-----|-----|-----|
Volume Module:
Base Vol: 79 1356 243 62 484 35 154 225 55 170 290 229
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 79 1356 243 62 484 35 154 225 55 170 290 229
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 79 1356 243 62 484 35 154 225 55 170 290 229
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 79 1356 243 62 484 35 154 225 55 170 290 229
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 79 1356 243 62 484 35 154 225 55 170 290 229
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Volume: 79 1356 243 62 484 35 154 225 55 170 290 229
-----|-----|-----|-----|
Saturation Flow Module:
Sat/Lane: 1425 1425 1425 1425 1425 1425 1425 1425 1425 1425 1425 1425
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 1.00 2.00 1.00 1.00 2.80 0.20 1.00 1.61 0.39 1.00 2.00 1.00
Final Sat.: 1425 2850 1425 1425 3987 288 1425 2290 560 1425 2850 1425
-----|-----|-----|-----|
Capacity Analysis Module:
Vol/Sat: 0.06 0.48 0.17 0.04 0.12 0.12 0.11 0.10 0.10 0.12 0.10 0.16
Crit Volume: 678 62 154 229
Crit Moves: **** **

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Intersection #5 Main at Vignes

Cycle (sec): 100 Critical Vol./Cap.(X): 0.625
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 50 Level Of Service: B

Street Name: Main St Vignes St
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
-----|-----|-----|-----|
Control: Permitted Permitted Protected Permitted
Rights: Include Include Include Include
Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
Lanes: 1 0 1 1 0 1 0 1 1 0 1 0 1 1 0
-----|-----|-----|-----|
Volume Module:
Base Vol: 10 728 18 132 366 103 101 163 3 22 408 161
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 10 728 18 132 366 103 101 163 3 22 408 161
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 10 728 18 132 366 103 101 163 3 22 408 161
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 10 728 18 132 366 103 101 163 3 22 408 161
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 10 728 18 132 366 103 101 163 3 22 408 161
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Volume: 10 728 18 132 366 103 101 163 3 22 408 161
-----|-----|-----|-----|
Saturation Flow Module:
Sat/Lane: 1425 1425 1425 1425 1425 1425 1425 1425 1425 1425 1425
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 1.00 1.95 0.05 1.00 1.56 0.44 1.00 1.96 0.04 1.00 1.43 0.57
Final Sat.: 1425 2781 69 1425 2224 626 1425 2798 52 1425 2044 806
-----|-----|-----|-----|
Capacity Analysis Module:
Vol/Sat: 0.01 0.26 0.26 0.09 0.16 0.16 0.07 0.06 0.06 0.02 0.20 0.20
Crit Volume: 373 132 101 285
Crit Moves: **** **

Intersection #6 Broadway at Cesar Chavez

Cycle (sec): 100 Critical Vol./Cap.(X): 0.920
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 180 Level Of Service: E

Street Name: Broadway Cesar Chavez Ave
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
-----|-----|-----|-----|
Control: Prot+Permit Permitted Protected Protected
Rights: Include Include Include Include
Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
Lanes: 1 0 1 1 0 1 0 1 1 0 2 0 2 1 0 1 0 3 0 1
-----|-----|-----|-----|
Volume Module:
Base Vol: 139 1007 247 75 516 136 278 979 38 224 953 109
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 139 1007 247 75 516 136 278 979 38 224 953 109
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 139 1007 247 75 516 136 278 979 38 224 953 109
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 139 1007 247 75 516 136 278 979 38 224 953 109
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 139 1007 247 75 516 136 278 979 38 224 953 109
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.10 1.00 1.00 1.00 1.00 1.00
Final Volume: 139 1007 247 75 516 136 306 979 38 224 953 109
-----|-----|-----|-----|
Saturation Flow Module:
Sat/Lane: 1375 1375 1375 1375 1375 1375 1375 1375 1375 1375 1375
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 1.00 1.61 0.39 1.00 1.58 0.42 2.00 2.89 0.11 1.00 3.00 1.00
Final Sat.: 1375 2208 542 1375 2176 574 2750 3971 154 1375 4125 1375
-----|-----|-----|-----|
Capacity Analysis Module:
Vol/Sat: 0.10 0.46 0.46 0.05 0.24 0.24 0.11 0.25 0.25 0.16 0.23 0.08
Crit Volume: 627 75 339 224
Crit Moves: **** **

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Intersection #7 Alameda at Cesar Chavez

Cycle (sec): 100 Critical Vol./Cap.(X): 0.896
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 180 Level Of Service: D

Street Name: Alameda St Cesar Chavez Ave
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
-----|-----|-----|-----|
Control: Prot+Permit Permitted Permitted Prot+Permit
Rights: Include Include Ovl Include
Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
Lanes: 1 0 2 0 1 1 0 2 1 0 1 0 2 1 0
-----|-----|-----|-----|
Volume Module:
Base Vol: 194 961 65 73 729 85 84 1166 185 96 925 93
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 194 961 65 73 729 85 84 1166 185 96 925 93
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 194 961 65 73 729 85 84 1166 185 96 925 93
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 194 961 65 73 729 85 84 1166 185 96 925 93
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 194 961 65 73 729 85 84 1166 185 96 925 93
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Volume: 194 961 65 73 729 85 84 1166 185 96 925 93
-----|-----|-----|-----|
Saturation Flow Module:
Sat/Lane: 1375 1375 1375 1375 1375 1375 1375 1375 1375 1375 1375 1375
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 1.00 2.00 1.00 1.00 2.69 0.31 1.00 2.00 1.00 1.00 2.73 0.27
Final Sat.: 1375 2750 1375 1375 3694 431 1375 2750 1375 1375 3748 377
-----|-----|-----|-----|
Capacity Analysis Module:
Vol/Sat: 0.14 0.35 0.05 0.05 0.20 0.20 0.06 0.42 0.13 0.07 0.25 0.25
Crit Volume: 481 73 583 96
Crit Moves: **** **

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Intersection #8 Vignes at Cesar Chavez

Cycle (sec): 100 Critical Vol./Cap.(X): 0.888
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 180 Level Of Service: D

Street Name: Vignes St Cesar Chavez Ave
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
-----|-----|-----|-----|
Control: Prot+Permit Prot+Permit Prot+Permit Prot+Permit
Rights: Ovl Ovl Ovl Ovl
Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
Lanes: 1 0 2 0 1 1 0 2 0 1 1 0 2 0 1
-----|-----|-----|-----|
Volume Module:
Base Vol: 207 495 205 268 215 81 83 1191 139 110 798 125
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 207 495 205 268 215 81 83 1191 139 110 798 125
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 207 495 205 268 215 81 83 1191 139 110 798 125
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 207 495 205 268 215 81 83 1191 139 110 798 125
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 207 495 205 268 215 81 83 1191 139 110 798 125
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Volume: 207 495 205 268 215 81 83 1191 139 110 798 125
-----|-----|-----|-----|
Saturation Flow Module:
Sat/Lane: 1375 1375 1375 1375 1375 1375 1375 1375 1375 1375 1375 1375
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 1.00 2.00 1.00 1.00 2.00 1.00 1.00 2.00 1.00 1.00 2.00 1.00
Final Sat.: 1375 2750 1375 1375 2750 1375 1375 2750 1375 1375 2750 1375
-----|-----|-----|-----|
Capacity Analysis Module:
Vol/Sat: 0.15 0.18 0.15 0.19 0.08 0.06 0.06 0.43 0.10 0.08 0.29 0.09
Crit Volume: 248 268 596 110
Crit Moves: **** **

Level Of Service Computation Report

Level Of Service Computation Report

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Circular 212 Planning Method (Future Volume Alternative)

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Circular 212 Planning Method (Future Volume Alternative)

Intersection #9 Vignes/US 101 WB Ramps at Ramirez

Cycle (sec): 100 Critical Vol./Cap.(X): 0.470
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 43 Level Of Service: A

Street Name: Vignes St/US 101 WB Ramps Ramirez St
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
-----|-----|-----|-----|
Control: Protected Protected Split Phase Split Phase
Rights: Ignore Include Include Ovl
Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
Lanes: 2 0 2 0 1 2 0 1 1 0 1 1 0 1 0 1 0 1 0 0 1 1
-----|-----|-----|-----|
Volume Module:
Base Vol: 42 265 46 245 116 177 181 43 52 107 89 427
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 42 265 46 245 116 177 181 43 52 107 89 427
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 42 265 46 245 116 177 181 43 52 107 89 427
User Adj: 1.00 1.00 0.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 0.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 42 265 0 245 116 177 181 43 52 107 89 427
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 42 265 0 245 116 177 181 43 52 107 89 427
PCE Adj: 1.00 1.00 0.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.10 1.00 0.00 1.10 1.00 1.00 1.10 1.00 1.00 1.00 1.00 1.10
Final Volume: 46 265 0 270 116 177 199 43 52 107 89 470
-----|-----|-----|-----|
Saturation Flow Module:
Sat/Lane: 1375 1375 1375 1375 1375 1375 1375 1375 1375 1375 1375
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 2.00 2.00 1.00 2.00 1.00 1.00 2.00 0.45 0.55 1.00 0.32 1.68
Final Sat.: 2750 2750 1375 2750 1375 1375 2750 622 753 1375 438 2312
-----|-----|-----|-----|
Capacity Analysis Module:
Vol/Sat: 0.02 0.10 0.00 0.10 0.08 0.13 0.07 0.07 0.07 0.08 0.20 0.20
Crit Volume: 133 135 100 279
Crit Moves: **** **

Intersection #10 Garey/US 101 SB Ramps at Commercial

Cycle (sec): 100 Critical Vol./Cap.(X): 0.660
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 55 Level Of Service: B

Street Name: Garey St/US 101 SB Ramps Commercial St
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
-----|-----|-----|-----|
Control: Split Phase Split Phase Protected Permitted
Rights: Include Include Include Include
Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
Lanes: 0 1 0 1 0 0 1 0 0 1 2 0 0 1 0 1 0 1 1 0
-----|-----|-----|-----|
Volume Module:
Base Vol: 57 320 9 48 3 87 911 72 3 3 56 159
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 57 320 9 48 3 87 911 72 3 3 56 159
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 57 320 9 48 3 87 911 72 3 3 56 159
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 57 320 9 48 3 87 911 72 3 3 56 159
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 57 320 9 48 3 87 911 72 3 3 56 159
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.10 1.00 1.00 1.00 1.00 1.00
Final Volume: 57 320 9 48 3 87 1002 72 3 3 56 159
-----|-----|-----|-----|
Saturation Flow Module:
Sat/Lane: 1425 1425 1425 1425 1425 1425 1425 1425 1425 1425 1425
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 0.29 1.66 0.05 0.94 0.06 1.00 2.00 0.96 0.04 1.00 1.00 1.00
Final Sat.: 421 2363 66 1341 84 1425 2850 1368 57 1425 1425 1425
-----|-----|-----|-----|
Capacity Analysis Module:
Vol/Sat: 0.14 0.14 0.14 0.04 0.04 0.06 0.35 0.05 0.05 0.00 0.04 0.11
Crit Volume: 193 87 501 159
Crit Moves: **** **

Level Of Service Computation Report

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 2000_HCM_4-Way_Stop_Method_(Future_Volume_Alternative)

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*****
Intersection #11 Center at Commercial
*****
Cycle (sec):          100          Critical Vol./Cap.(X):          0.518
Loss Time (sec):      0 (Y+R=4.0 sec)  Average Delay (sec/veh):      11.2
Optimal Cycle:        0          Level Of Service:              B
*****
Street Name:          Center St          Commercial St
Approach:             North Bound        South Bound        East Bound        West Bound
Movement:             L - T - R          L - T - R          L - T - R          L - T - R
-----|-----|-----|-----|
Control:              Stop Sign          Stop Sign          Stop Sign          Stop Sign
Rights:               Include            Include            Include            Include
Min. Green:           0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Lanes:                1 0 1 0 1 1 0 1 0 1 0 0 1 0 0 0
-----|-----|-----|-----|
Volume Module:
Base Vol:             53 333 1 1 165 245 118 7 47 3 14 11
Growth Adj:           1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse:          53 333 1 1 165 245 118 7 47 3 14 11
Added Vol:            0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol:         0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut:          53 333 1 1 165 245 118 7 47 3 14 11
User Adj:             1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj:              1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume:           53 333 1 1 165 245 118 7 47 3 14 11
Reduct Vol:           0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol:         53 333 1 1 165 245 118 7 47 3 14 11
PCE Adj:              1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj:              1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume:         53 333 1 1 165 245 118 7 47 3 14 11
-----|-----|-----|-----|
Saturation Flow Module:
Adjustment:           1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes:                1.00 1.00 1.00 1.00 1.00 1.00 0.69 0.04 0.27 0.11 0.50 0.39
Final Sat.:           586 642 727 585 638 730 405 24 161 59 275 216
-----|-----|-----|-----|
Capacity Analysis Module:
Vol/Sat:              0.09 0.52 0.00 0.00 0.26 0.34 0.29 0.29 0.29 0.05 0.05 0.05
Crit Moves:          ****          ****          ****          ****
Delay/Veh:            9.3 13.7 7.5 8.7 10.0 9.8 10.8 10.8 10.8 9.1 9.1 9.1
Delay Adj:            1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh:          9.3 13.7 7.5 8.7 10.0 9.8 10.8 10.8 10.8 9.1 9.1 9.1
LOS by Move:         A B A B A B B A A A
ApproachDel:         13.1 9.9 10.8 9.1
Delay Adj:           1.00 1.00 1.00 1.00
ApprAdjDel:          13.1 9.9 10.8 9.1
LOS by Appr:         B A B A
AllWayAvgQ:          0.1 1.0 0.0 0.0 0.3 0.5 0.3 0.3 0.3 0.0 0.0 0.0
*****
    
```

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

**FUTURE WITH PROJECT
CONDITIONS**

Scenario: Future w/ Project AM

Command: Future Alt 1 AM
 Volume: Future + Project Alt 1 AM
 Geometry: Existing
 Impact Fee: Default Impact Fee
 Trip Generation: Project AM
 Trip Distribution: No Cesar Chavez
 Paths: Default Path
 Routes: Default Route
 Configuration: Future Alt 1 AM

Intersection	Base	Future		Change in
		V/ C	Del/ Veh C	
# 1 Figueroa/I-110 NB On-Ramp at A	A xxxxx 0.373	A xxxxx 0.373	LOS	+ 0.000 V/C
# 2 Hill at Alpine	C xxxxx 0.765	C xxxxx 0.765		+ 0.000 V/C
# 3 Broadway at Alpine St	C xxxxx 0.784	C xxxxx 0.784		+ 0.000 V/C
# 4 Alameda at Vignes	B xxxxx 0.629	B xxxxx 0.629		+ 0.000 V/C
# 5 Main at Vignes	A xxxxx 0.546	A xxxxx 0.546		+ 0.000 V/C
# 6 Broadway at Cesar Chavez	D xxxxx 0.864	D xxxxx 0.864		+ 0.000 V/C
# 7 Alameda at Cesar Chavez	D xxxxx 0.818	D xxxxx 0.818		+ 0.000 V/C
# 8 Vignes at Cesar Chavez	C xxxxx 0.771	C xxxxx 0.771		+ 0.000 V/C
# 9 Vignes/US 101 WB Ramps at Rami	A xxxxx 0.355	A xxxxx 0.355		+ 0.000 V/C
# 10 Garey/US 101 SB Ramps at Comme	A xxxxx 0.324	A xxxxx 0.324		+ 0.000 V/C
# 11 Center at Commercial	A 9.1 0.305	A 9.1 0.305		+ 0.000 V/C

Level Of Service Computation Report

Level Of Service Computation Report

Future w/ Project AM Tue Jul 15, 2008 15:58:57 Page 3-1
Circular 212 Planning Method (Future Volume Alternative)

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Circular 212 Planning Method (Future Volume Alternative)

Intersection #1 Figueroa/I-110 NB On-Ramp at Alpine

Cycle (sec): 100 Critical Vol./Cap.(X): 0.373
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 30 Level Of Service: A

Street Name: Figueroa St/I-110 NB On-Ramp Alpine St
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
-----|-----|-----|-----|
Control: Permitted Permitted Split Phase Split Phase
Rights: Include Include Include Include
Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
Lanes: 1 1 0 1 0 0 0 0 0 0 0 0
-----|-----|-----|-----|
Volume Module:
Base Vol: 65 410 0 0 0 0 0 0 36 289 128 21 0
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 65 410 0 0 0 0 0 0 36 289 128 21 0
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 65 410 0 0 0 0 0 0 36 289 128 21 0
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 65 410 0 0 0 0 0 0 36 289 128 21 0
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 65 410 0 0 0 0 0 0 36 289 128 21 0
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.10 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.10 1.00 1.00 1.00
FinalVolume: 72 410 0 0 0 0 0 0 36 318 128 21 0
-----|-----|-----|-----|
Saturation Flow Module:
Sat/Lane: 1425 1425 1425 1425 1425 1425 1425 1425 1425 1425 1425
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 1.00 2.00 0.00 0.00 0.00 0.00 0.00 0.20 1.80 0.86 0.14 0.00
Final Sat.: 1425 2850 0 0 0 0 0 0 290 2560 1224 201 0
-----|-----|-----|-----|
Capacity Analysis Module:
Vol/Sat: 0.05 0.14 0.00 0.00 0.00 0.00 0.12 0.12 0.10 0.10 0.00
Crit Volume: 205 0 177 149
Crit Moves: **** **

Intersection #2 Hill at Alpine

Cycle (sec): 100 Critical Vol./Cap.(X): 0.765
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 61 Level Of Service: C

Street Name: Hill St Alpine St
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
-----|-----|-----|-----|
Control: Permitted Permitted Permitted Permitted
Rights: Include Include Include Include
Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
Lanes: 1 0 1 1 0 1 0 1 1 0 0 1 0 1 0
-----|-----|-----|-----|
Volume Module:
Base Vol: 16 280 12 50 1741 48 20 107 19 154 270 36
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 16 280 12 50 1741 48 20 107 19 154 270 36
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 16 280 12 50 1741 48 20 107 19 154 270 36
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 16 280 12 50 1741 48 20 107 19 154 270 36
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 16 280 12 50 1741 48 20 107 19 154 270 36
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 2.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume: 16 280 12 50 1741 48 40 107 19 154 270 36
-----|-----|-----|-----|
Saturation Flow Module:
Sat/Lane: 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 1.00 1.92 0.08 1.00 1.95 0.05 0.32 1.45 0.23 0.67 1.17 0.16
Final Sat.: 1500 2877 123 1500 2920 80 476 2180 343 1004 1761 235
-----|-----|-----|-----|
Capacity Analysis Module:
Vol/Sat: 0.01 0.10 0.10 0.03 0.60 0.60 0.04 0.05 0.06 0.15 0.15 0.15
Crit Volume: 16 895 83 154
Crit Moves: **** **

Level Of Service Computation Report

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Circular 212 Planning Method (Future Volume Alternative)

Intersection #3 Broadway at Alpine St

Cycle (sec): 100 Critical Vol./Cap.(X): 0.784
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 86 Level Of Service: C

Street Name: Broadway Alpine St
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
-----|-----|-----|-----|
Control: Prot+Permit Permitted Permitted Permitted
Rights: Include Include Include Include
Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
Lanes: 1 0 1 1 0 1 0 1 1 0 0 1 0 1 0
-----|-----|-----|-----|
Volume Module:
Base Vol: 24 325 40 93 1536 143 14 101 23 123 292 65
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 24 325 40 93 1536 143 14 101 23 123 292 65
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 24 325 40 93 1536 143 14 101 23 123 292 65
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 24 325 40 93 1536 143 14 101 23 123 292 65
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 24 325 40 93 1536 143 14 101 23 123 292 65
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 2.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Volume: 24 325 40 93 1536 143 28 101 23 123 292 65
-----|-----|-----|-----|
Saturation Flow Module:
Sat/Lane: 1425 1425 1425 1425 1425 1425 1425 1425 1425 1425 1425 1425
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 1.00 1.78 0.22 1.00 1.83 0.17 0.23 1.47 0.30 0.51 1.22 0.27
Final Sat.: 1425 2538 312 1425 2607 243 322 2097 431 730 1734 386
-----|-----|-----|-----|
Capacity Analysis Module:
Vol/Sat: 0.02 0.13 0.13 0.07 0.59 0.59 0.04 0.05 0.05 0.17 0.17 0.17
Crit Volume: 24 840 14 240
Crit Moves: **** **

Level Of Service Computation Report

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Circular 212 Planning Method (Future Volume Alternative)

Intersection #4 Alameda at Vignes

Cycle (sec): 100 Critical Vol./Cap.(X): 0.629
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 50 Level Of Service: B

Street Name: Alameda St Vignes St
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
-----|-----|-----|-----|
Control: Permitted Permitted Permitted Prot+Permit
Rights: Ovl Include Include Include
Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
Lanes: 1 0 2 0 1 1 0 2 1 0 1 0 1 1 0 1 0 2 0 1
-----|-----|-----|-----|
Volume Module:
Base Vol: 45 426 164 127 1114 222 63 85 37 345 551 64
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 45 426 164 127 1114 222 63 85 37 345 551 64
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 45 426 164 127 1114 222 63 85 37 345 551 64
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 45 426 164 127 1114 222 63 85 37 345 551 64
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 45 426 164 127 1114 222 63 85 37 345 551 64
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Volume: 45 426 164 127 1114 222 63 85 37 345 551 64
-----|-----|-----|-----|
Saturation Flow Module:
Sat/Lane: 1425 1425 1425 1425 1425 1425 1425 1425 1425 1425 1425 1425
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 1.00 2.00 1.00 1.00 2.50 0.50 1.00 1.39 0.61 1.00 2.00 1.00
Final Sat.: 1425 2850 1425 1425 3565 710 1425 1986 864 1425 2850 1425
-----|-----|-----|-----|
Capacity Analysis Module:
Vol/Sat: 0.03 0.15 0.12 0.09 0.31 0.31 0.04 0.04 0.04 0.24 0.19 0.04
Crit Volume: 45 445 61 345
Crit Moves: **** **

Level Of Service Computation Report

Level Of Service Computation Report

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Circular 212 Planning Method (Future Volume Alternative)

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Circular 212 Planning Method (Future Volume Alternative)

Intersection #5 Main at Vignes

Cycle (sec): 100 Critical Vol./Cap.(X): 0.546
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 41 Level Of Service: A

Street Name: Main St Vignes St
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
-----|-----|-----|-----|
Control: Permitted Permitted Protected Permitted
Rights: Include Include Include Include
Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
Lanes: 1 0 1 1 0 1 0 1 1 0 1 0 1 1 0
-----|-----|-----|-----|
Volume Module:
Base Vol: 4 296 58 167 521 469 54 155 7 24 354 96
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 4 296 58 167 521 469 54 155 7 24 354 96
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 4 296 58 167 521 469 54 155 7 24 354 96
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 4 296 58 167 521 469 54 155 7 24 354 96
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 4 296 58 167 521 469 54 155 7 24 354 96
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume: 4 296 58 167 521 469 54 155 7 24 354 96
-----|-----|-----|-----|
Saturation Flow Module:
Sat/Lane: 1425 1425 1425 1425 1425 1425 1425 1425 1425 1425 1425
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 1.00 1.67 0.33 1.00 1.05 0.95 1.00 1.91 0.09 1.00 1.57 0.43
Final Sat.: 1425 2383 467 1425 1500 1350 1425 2727 123 1425 2242 608
-----|-----|-----|-----|
Capacity Analysis Module:
Vol/Sat: 0.00 0.12 0.12 0.12 0.35 0.35 0.04 0.06 0.06 0.02 0.16 0.16
Crit Volume: 4 495 54 225
Crit Moves: **** **** **** ****

Intersection #6 Broadway at Cesar Chavez

Cycle (sec): 100 Critical Vol./Cap.(X): 0.864
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 167 Level Of Service: D

Street Name: Broadway Cesar Chavez Ave
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
-----|-----|-----|-----|
Control: Prot+Permit Permitted Protected Protected
Rights: Include Include Include Include
Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
Lanes: 1 0 1 1 0 1 0 1 1 0 2 0 2 1 0 1 0 3 0 1
-----|-----|-----|-----|
Volume Module:
Base Vol: 113 439 256 144 966 267 113 732 72 190 1147 75
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 113 439 256 144 966 267 113 732 72 190 1147 75
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 113 439 256 144 966 267 113 732 72 190 1147 75
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 113 439 256 144 966 267 113 732 72 190 1147 75
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 113 439 256 144 966 267 113 732 72 190 1147 75
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.10 1.00 1.00 1.00 1.00 1.00
FinalVolume: 113 439 256 144 966 267 124 732 72 190 1147 75
-----|-----|-----|-----|
Saturation Flow Module:
Sat/Lane: 1375 1375 1375 1375 1375 1375 1375 1375 1375 1375 1375 1375
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 1.00 1.26 0.74 1.00 1.57 0.43 2.00 2.73 0.27 1.00 3.00 1.00
Final Sat.: 1375 1737 1013 1375 2155 595 2750 3756 369 1375 4125 1375
-----|-----|-----|-----|
Capacity Analysis Module:
Vol/Sat: 0.08 0.25 0.25 0.10 0.45 0.45 0.05 0.19 0.19 0.14 0.28 0.05
Crit Volume: 113 617 268 190
Crit Moves: **** **** **** ****

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Circular 212 Planning Method (Future Volume Alternative)

Intersection #7 Alameda at Cesar Chavez

Cycle (sec):	100	Critical Vol./Cap.(X):	0.818
Loss Time (sec):	0 (Y+R=4.0 sec)	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	125	Level Of Service:	D

Street Name:	Alameda St				Cesar Chavez Ave				
Approach:	North Bound		South Bound		East Bound		West Bound		
Movement:	L	T	R	L	T	R	L	T	R
Control:	Prot+Permit		Permitted		Permitted		Prot+Permit		
Rights:	Include		Include		Ovl		Include		
Min. Green:	0	0	0	0	0	0	0	0	0
Lanes:	1	0	2	0	1	1	0	2	0

Volume Module:

Base Vol:	118	372	171	65	1219	213	60	697	118	181	1284	49
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	118	372	171	65	1219	213	60	697	118	181	1284	49
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	118	372	171	65	1219	213	60	697	118	181	1284	49
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	118	372	171	65	1219	213	60	697	118	181	1284	49
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	118	372	171	65	1219	213	60	697	118	181	1284	49
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Volume:	118	372	171	65	1219	213	60	697	118	181	1284	49

Saturation Flow Module:

Sat/Lane:	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.00	1.00	1.00	2.55	0.45	1.00	2.00	1.00	1.00	2.89	0.11
Final Sat.:	1375	2750	1375	1375	3511	614	1375	2750	1375	1375	3973	152

Capacity Analysis Module:

Vol/Sat:	0.09	0.14	0.12	0.05	0.35	0.35	0.04	0.25	0.09	0.13	0.32	0.32
Crit Volume:	118			477	348	181						
Crit Moves:	****			****	****	****						

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Circular 212 Planning Method (Future Volume Alternative)

Intersection #8 Vignes at Cesar Chavez

Cycle (sec):	100	Critical Vol./Cap.(X):	0.771
Loss Time (sec):	0 (Y+R=4.0 sec)	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	99	Level Of Service:	C

Street Name:	Vignes St				Cesar Chavez Ave				
Approach:	North Bound		South Bound		East Bound		West Bound		
Movement:	L	T	R	L	T	R	L	T	R
Control:	Prot+Permit		Prot+Permit		Prot+Permit		Prot+Permit		
Rights:	Ovl		Ovl		Ovl		Ovl		
Min. Green:	0	0	0	0	0	0	0	0	0
Lanes:	1	0	2	0	1	1	0	2	0

Volume Module:

Base Vol:	146	250	95	124	272	54	139	602	141	270	1277	192
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	146	250	95	124	272	54	139	602	141	270	1277	192
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	146	250	95	124	272	54	139	602	141	270	1277	192
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	146	250	95	124	272	54	139	602	141	270	1277	192
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	146	250	95	124	272	54	139	602	141	270	1277	192
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Volume:	146	250	95	124	272	54	139	602	141	270	1277	192

Saturation Flow Module:

Sat/Lane:	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.00	1.00	1.00	2.00	1.00	1.00	2.00	1.00	1.00	2.00	1.00
Final Sat.:	1375	2750	1375	1375	2750	1375	1375	2750	1375	1375	2750	1375

Capacity Analysis Module:

Vol/Sat:	0.11	0.09	0.07	0.09	0.10	0.04	0.10	0.22	0.10	0.20	0.46	0.14
Crit Volume:	146			136	139	639						
Crit Moves:	****			****	****	****						

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Circular 212 Planning Method (Future Volume Alternative)

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Circular 212 Planning Method (Future Volume Alternative)

Intersection #9 Vignes/US 101 WB Ramps at Ramirez

Cycle (sec): 100 Critical Vol./Cap.(X): 0.355
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 35 Level Of Service: A

Street Name: Vignes St/US 101 WB Ramps Ramirez St
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
-----|-----|-----|-----|
Control: Protected Protected Split Phase Split Phase
Rights: Ignore Include Include Ovl
Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
Lanes: 2 0 2 0 1 2 0 1 1 0 1 1 0 1 0 1 1
-----|-----|-----|-----|
Volume Module:
Base Vol: 24 176 73 338 134 222 150 32 51 80 42 201
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 24 176 73 338 134 222 150 32 51 80 42 201
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 24 176 73 338 134 222 150 32 51 80 42 201
User Adj: 1.00 1.00 0.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 0.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 24 176 0 338 134 222 150 32 51 80 42 201
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 24 176 0 338 134 222 150 32 51 80 42 201
PCE Adj: 1.00 1.00 0.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.10 1.00 0.00 1.10 1.00 1.00 1.10 1.00 1.00 1.00 1.00 1.10
Final Volume: 26 176 0 372 134 222 165 32 51 80 42 221
-----|-----|-----|-----|
Saturation Flow Module:
Sat/Lane: 1375 1375 1375 1375 1375 1375 1375 1375 1375 1375 1375
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 2.00 2.00 1.00 2.00 1.00 1.00 2.00 0.39 0.61 1.00 0.32 1.68
Final Sat.: 2750 2750 1375 2750 1375 1375 2750 530 845 1375 439 2311
-----|-----|-----|-----|
Capacity Analysis Module:
Vol/Sat: 0.01 0.06 0.00 0.14 0.10 0.16 0.06 0.06 0.06 0.06 0.10 0.10
Crit Volume: 88 186 83 132
Crit Moves: **** **

Intersection #10 Garey/US 101 SB Ramps at Commercial

Cycle (sec): 100 Critical Vol./Cap.(X): 0.324
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 28 Level Of Service: A

Street Name: Garey St/US 101 SB Ramps Commercial St
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
-----|-----|-----|-----|
Control: Split Phase Split Phase Protected Permitted
Rights: Include Include Include Include
Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
Lanes: 0 1 0 1 0 0 1 0 0 1 2 0 0 1 0 1 0 1 1 0
-----|-----|-----|-----|
Volume Module:
Base Vol: 59 16 5 126 16 187 278 42 15 2 83 44
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 59 16 5 126 16 187 278 42 15 2 83 44
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 59 16 5 126 16 187 278 42 15 2 83 44
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 59 16 5 126 16 187 278 42 15 2 83 44
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 59 16 5 126 16 187 278 42 15 2 83 44
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.10 1.00 1.00 1.00 1.00 1.00
Final Volume: 59 16 5 126 16 187 306 42 15 2 83 44
-----|-----|-----|-----|
Saturation Flow Module:
Sat/Lane: 1425 1425 1425 1425 1425 1425 1425 1425 1425 1425 1425
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 1.00 0.88 0.12 0.89 0.11 1.00 2.00 0.74 0.26 1.00 1.31 0.69
Final Sat.: 1425 1247 178 1264 161 1425 2850 1050 375 1425 1863 987
-----|-----|-----|-----|
Capacity Analysis Module:
Vol/Sat: 0.04 0.01 0.03 0.10 0.10 0.13 0.11 0.04 0.04 0.00 0.04 0.04
Crit Volume: 59 187 153 64
Crit Moves: **** **

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 2000_BCM_4-Way_Stop_Method_(Future_Volume_Alternative)

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*****
Intersection #11 Center at Commercial
*****
Cycle (sec):          100          Critical Vol./Cap.(X):          0.305
Loss Time (sec):      0 (Y+R=4.0 sec)  Average Delay (sec/veh):          9.1
Optimal Cycle:        0              Level Of Service:          A
*****
Street Name:          Center St          Commercial St
Approach:             North Bound        South Bound        East Bound        West Bound
Movement:             L - T - R          L - T - R          L - T - R          L - T - R
-----|-----|-----|-----|
Control:              Stop Sign          Stop Sign          Stop Sign          Stop Sign
Rights:               Include            Include            Include            Include
Min. Green:           0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Lanes:                1 0 1 0 1 1 0 1 0 1 0 0 0 0 1 0 0
-----|-----|-----|-----|
Volume Module:
Base Vol:             23 146 3 8 212 122 92 7 35 1 17 7
Growth Adj:           1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse:          23 146 3 8 212 122 92 7 35 1 17 7
Added Vol:            0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol:         0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut:          23 146 3 8 212 122 92 7 35 1 17 7
User Adj:             1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj:              1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume:          23 146 3 8 212 122 92 7 35 1 17 7
Reduct Vol:           0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol:         23 146 3 8 212 122 92 7 35 1 17 7
PCE Adj:              1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj:              1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume:         23 146 3 8 212 122 92 7 35 1 17 7
-----|-----|-----|-----|
Saturation Flow Module:
Adjustment:           1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes:                1.00 1.00 1.00 1.00 1.00 1.00 0.69 0.05 0.26 0.04 0.68 0.28
Final Sat.:           613 671 769 633 695 804 459 35 175 26 442 182
-----|-----|-----|-----|
Capacity Analysis Module:
Vol/Sat:              0.04 0.22 0.00 0.01 0.31 0.15 0.20 0.20 0.20 0.04 0.04 0.04
Crit Moves:          ****          ****          ****          ****
Delay/Veh:            8.6 9.3 7.2 8.3 9.9 7.8 9.2 9.2 9.2 8.3 8.3 8.3
Delay Adj:            1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh:           8.6 9.3 7.2 8.3 9.9 7.8 9.2 9.2 9.2 8.3 8.3 8.3
LOS by Move:          A A A A A A A A A A A A
ApproachDel:          9.2          9.1          9.2          8.3
Delay Adj:            1.00          1.00          1.00          1.00
ApprAdjDel:           9.2          9.1          9.2          8.3
LOS by Appr:          A          A          A          A
AllWayAvgQ:           0.0 0.3 0.0 0.0 0.4 0.2 0.2 0.2 0.2 0.0 0.0 0.0
*****
    
```

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

 Scenario: Future w/ Project PM
 Command: Future Alt 1 PM
 Volume: Future + Project Alt 1 PM
 Geometry: Existing
 Impact Fee: Default Impact Fee
 Trip Generation: Project PM
 Trip Distribution: No Cesar Chavez
 Paths: Default Path
 Routes: Default Route
 Configuration: Future Alt 1 PM

Intersection	Base	Future		Change in
		V/ C	Del/ Veh C	
# 1 Figueroa/I-110 NB On-Ramp at A	A xxxxx 0.405	A xxxxx	0.405	+ 0.000 V/C
# 2 Hill at Alpine	C xxxxx 0.743	C xxxxx	0.743	+ 0.000 V/C
# 3 Broadway at Alpine St	C xxxxx 0.730	C xxxxx	0.730	+ 0.000 V/C
# 4 Alameda at Vignes	C xxxxx 0.792	C xxxxx	0.792	+ 0.000 V/C
# 5 Main at Vignes	B xxxxx 0.627	B xxxxx	0.627	+ 0.000 V/C
# 6 Broadway at Cesar Chavez	E xxxxx 0.927	E xxxxx	0.927	+ 0.000 V/C
# 7 Alameda at Cesar Chavez	E xxxxx 0.901	E xxxxx	0.901	+ 0.000 V/C
# 8 Vignes at Cesar Chavez	E xxxxx 0.903	E xxxxx	0.903	+ 0.000 V/C
# 9 Vignes/US 101 WB Ramps at Rami	A xxxxx 0.478	A xxxxx	0.478	+ 0.000 V/C
# 10 Garey/US 101 SB Ramps at Comme	B xxxxx 0.667	B xxxxx	0.667	+ 0.000 V/C
# 11 Center at Commercial	B 11.3 0.521	B 11.3	0.521	+ 0.000 V/C

Circular 212 Planning Method (Future Volume Alternative)

Circular 212 Planning Method (Future Volume Alternative)

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Intersection #1 Figueroa/I-110 NB On-Ramp at Alpine

Intersection #2 Hill at Alpine

Cycle (sec): 100 Critical Vol./Cap.(X): 0.405
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 31 Level Of Service: A

Cycle (sec): 100 Critical Vol./Cap.(X): 0.743
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 56 Level Of Service: C

Table with columns: Street Name, Approach, Movement, Control, Rights, Min. Green, Lanes. Rows for North Bound, South Bound, East Bound, West Bound.

Table with columns: Street Name, Approach, Movement, Control, Rights, Min. Green, Lanes. Rows for North Bound, South Bound, East Bound, West Bound.

Volume Module table with columns: Base Vol, Growth Adj, Initial Bse, Added Vol, PasserByVol, Initial Fut, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, PCE Adj, MLF Adj, Final Volume.

Volume Module table with columns: Base Vol, Growth Adj, Initial Bse, Added Vol, PasserByVol, Initial Fut, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, PCE Adj, MLF Adj, Final Volume.

Saturation Flow Module table with columns: Sat/Lane, Adjustment, Lanes, Final Sat.

Saturation Flow Module table with columns: Sat/Lane, Adjustment, Lanes, Final Sat.

Capacity Analysis Module table with columns: Vol/Sat, Crit Volume, Crit Moves.

Capacity Analysis Module table with columns: Vol/Sat, Crit Volume, Crit Moves.

Circular 212 Planning Method (Future Volume Alternative)

Circular 212 Planning Method (Future Volume Alternative)

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Intersection #3 Broadway at Alpine St

Intersection #4 Alameda at Vignes

Cycle (sec): 100 Critical Vol./Cap.(X): 0.730
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 69 Level Of Service: C

Cycle (sec): 100 Critical Vol./Cap.(X): 0.792
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 89 Level Of Service: C

Table with columns: Street Name, Approach, Movement, Control, Rights, Min. Green, Lanes. Rows for Broadway and Alpine St.

Table with columns: Street Name, Approach, Movement, Control, Rights, Min. Green, Lanes. Rows for Alameda and Vignes St.

Volume Module table with columns: Base Vol, Growth Adj, Initial Bse, Added Vol, PasserByVol, Initial Fut, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, PCE Adj, MLF Adj, Final Volume.

Volume Module table with columns: Base Vol, Growth Adj, Initial Bse, Added Vol, PasserByVol, Initial Fut, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, PCE Adj, MLF Adj, Final Volume.

Saturation Flow Module table with columns: Sat/Lane, Adjustment, Lanes, Final Sat.

Saturation Flow Module table with columns: Sat/Lane, Adjustment, Lanes, Final Sat.

Capacity Analysis Module table with columns: Vol/Sat, Crit Volume, Crit Moves.

Capacity Analysis Module table with columns: Vol/Sat, Crit Volume, Crit Moves.

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Circular 212 Planning Method (Future Volume Alternative)

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Intersection #5 Main at Vignes

Intersection #6 Broadway at Cesar Chavez

Cycle (sec): 100 Critical Vol./Cap.(X): 0.627
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 50 Level Of Service: B

Cycle (sec): 100 Critical Vol./Cap.(X): 0.927
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 180 Level Of Service: E

Table with columns: Street Name, Approach, Movement, Control, Rights, Min. Green, Lanes. Rows for North Bound, South Bound, East Bound, West Bound.

Table with columns: Street Name, Approach, Movement, Control, Rights, Min. Green, Lanes. Rows for North Bound, South Bound, East Bound, West Bound.

Volume Module: Base Vol, Growth Adj, Initial Bse, Added Vol, PasserByVol, Initial Fut, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, PCE Adj, MLF Adj, Final Volume.

Volume Module: Base Vol, Growth Adj, Initial Bse, Added Vol, PasserByVol, Initial Fut, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, PCE Adj, MLF Adj, Final Volume.

Saturation Flow Module: Sat/Lane, Adjustment, Lanes, Final Sat.

Saturation Flow Module: Sat/Lane, Adjustment, Lanes, Final Sat.

Capacity Analysis Module: Vol/Sat, Crit Volume, Crit Moves.

Capacity Analysis Module: Vol/Sat, Crit Volume, Crit Moves.

Circular 212 Planning Method (Future Volume Alternative)

Circular 212 Planning Method (Future Volume Alternative)

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Intersection #7 Alameda at Cesar Chavez

Intersection #8 Vignes at Cesar Chavez

Cycle (sec): 100 Critical Vol./Cap.(X): 0.901
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 180 Level Of Service: E

Cycle (sec): 100 Critical Vol./Cap.(X): 0.903
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 180 Level Of Service: E

Table with columns: Street Name, Approach, Movement, Control, Rights, Min. Green, Lanes. Rows for Alameda St and Cesar Chavez Ave.

Table with columns: Street Name, Approach, Movement, Control, Rights, Min. Green, Lanes. Rows for Vignes St and Cesar Chavez Ave.

Volume Module: Base Vol, Growth Adj, Initial Bse, Added Vol, PasserByVol, Initial Fut, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, PCE Adj, MLF Adj, Final Volume.

Volume Module: Base Vol, Growth Adj, Initial Bse, Added Vol, PasserByVol, Initial Fut, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, PCE Adj, MLF Adj, Final Volume.

Saturation Flow Module: Sat/Lane, Adjustment, Lanes, Final Sat.

Saturation Flow Module: Sat/Lane, Adjustment, Lanes, Final Sat.

Capacity Analysis Module: Vol/Sat, Crit Volume, Crit Moves.

Capacity Analysis Module: Vol/Sat, Crit Volume, Crit Moves.

Circular 212 Planning Method (Future Volume Alternative)

Circular 212 Planning Method (Future Volume Alternative)

Future w/ Project PM Tue Jul 15, 2008 15:59:43 Page 11-1

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Intersection #9 Vignes/US 101 WB Ramps at Ramirez

Intersection #10 Garey/US 101 SB Ramps at Commercial

Cycle (sec): 100 Critical Vol./Cap.(X): 0.478
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 44 Level Of Service: A

Cycle (sec): 100 Critical Vol./Cap.(X): 0.667
Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
Optimal Cycle: 56 Level Of Service: B

Street Name:	Vignes St/US 101 WB Ramps				Ramirez St				
Approach:	North Bound		South Bound		East Bound		West Bound		
Movement:	L	T	R	L	T	R	L	T	R
Control:	Protected		Protected		Split Phase		Split Phase		
Rights:	Ignore		Include		Include		Ovl		
Min. Green:	0	0	0	0	0	0	0	0	0
Lanes:	2	0	2	0	1	1	0	1	1

Street Name:	Garey St/US 101 SB Ramps				Commercial St						
Approach:	North Bound		South Bound		East Bound		West Bound				
Movement:	L	T	R	L	T	R	L	T	R		
Control:	Split Phase		Split Phase		Protected		Permitted				
Rights:	Include		Include		Include		Include				
Min. Green:	0	0	0	0	0	0	0	0	0		
Lanes:	0	1	0	1	0	0	1	0	1	1	0

Volume Module:

Base Vol:	42	273	46	255	120	177	181	43	52	107	89	430
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	42	273	46	255	120	177	181	43	52	107	89	430
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	42	273	46	255	120	177	181	43	52	107	89	430
User Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	42	273	0	255	120	177	181	43	52	107	89	430
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	42	273	0	255	120	177	181	43	52	107	89	430
PCE Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.10	1.00	0.00	1.10	1.00	1.00	1.10	1.00	1.00	1.00	1.00	1.10
Final Volume:	46	273	0	281	120	177	199	43	52	107	89	473

Volume Module:

Base Vol:	57	320	9	51	3	87	911	72	3	3	56	169
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	57	320	9	51	3	87	911	72	3	3	56	169
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	57	320	9	51	3	87	911	72	3	3	56	169
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	57	320	9	51	3	87	911	72	3	3	56	169
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	57	320	9	51	3	87	911	72	3	3	56	169
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.10	1.00	1.00	1.00	1.00	1.00
Final Volume:	57	320	9	51	3	87	1002	72	3	3	56	169

Saturation Flow Module:

Sat/Lane:	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	2.00	2.00	1.00	2.00	1.00	1.00	2.00	0.45	0.55	1.00	0.32	1.68
Final Sat.:	2750	2750	1375	2750	1375	1375	2750	622	753	1375	435	2315

Saturation Flow Module:

Sat/Lane:	1425	1425	1425	1425	1425	1425	1425	1425	1425	1425	1425	1425
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.29	1.66	0.05	0.94	0.06	1.00	2.00	0.96	0.04	1.00	1.00	1.00
Final Sat.:	421	2363	66	1346	79	1425	2850	1368	57	1425	1425	1425

Capacity Analysis Module:

Vol/Sat:	0.02	0.10	0.00	0.10	0.09	0.13	0.07	0.07	0.07	0.08	0.20	0.20
Crit Volume:	137	140		140		100				281		
Crit Moves:	****	****		****		****				****		

Capacity Analysis Module:

Vol/Sat:	0.14	0.14	0.14	0.04	0.04	0.06	0.35	0.05	0.05	0.00	0.04	0.12
Crit Volume:	193			87		501				169		
Crit Moves:	****			****		****				****		

2000 HCM 4-Way Stop Method (Future Volume Alternative)

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 Intersection #11 Center at Commercial

Cycle (sec): 100 Critical Vol./Cap.(X): 0.521
 Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): 11.3
 Optimal Cycle: 0 Level Of Service: B

Street Name:	Center St			Commercial St		
Approach:	North Bound		South Bound	East Bound		West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Stop Sign		Stop Sign	Stop Sign		Stop Sign
Rights:	Include		Include	Include		Include
Min. Green:	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0
Lanes:	1 0 1 0 1	1 0 1 0 1	0 0 1 0 0	0 0 1 0 0	0 0 1 0 0	0 0 1 0 0

Volume Module:

Base Vol:	53 333	1 1 165 255	121 7 47	3 14 11
Growth Adj:	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00
Initial Bse:	53 333	1 1 165 255	121 7 47	3 14 11
Added Vol:	0 0 0	0 0 0	0 0 0	0 0 0
PasserByVol:	0 0 0	0 0 0	0 0 0	0 0 0
Initial Fut:	53 333	1 1 165 255	121 7 47	3 14 11
User Adj:	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00
PHF Adj:	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00
PHF Volume:	53 333	1 1 165 255	121 7 47	3 14 11
Reduced Vol:	0 0 0	0 0 0	0 0 0	0 0 0
Reduced Vol:	53 333	1 1 165 255	121 7 47	3 14 11
PCE Adj:	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00
MLF Adj:	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00
FinalVolume:	53 333	1 1 165 255	121 7 47	3 14 11

Saturation Flow Module:

Adjustment:	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00
Lanes:	1.00 1.00 1.00	1.00 1.00 1.00	0.69 0.04 0.27	0.11 0.50 0.39
Final Sat.:	583 640 724	583 637 728	407 24 158	59 273 215

Capacity Analysis Module:

Vol/Sat:	0.09 0.52 0.00	0.00 0.26 0.35	0.30 0.30 0.30	0.05 0.05 0.05
Crit Moves:	****	****	****	****
Delay/Veh:	9.3 13.8 7.5	8.7 10.1 10.0	10.9 10.9 10.9	9.1 9.1 9.1
Delay Adj:	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00
AdjDel/Veh:	9.3 13.8 7.5	8.7 10.1 10.0	10.9 10.9 10.9	9.1 9.1 9.1
LOS by Move:	A B A	A B A	B B B	A A A
ApproachDel:	13.2	10.0	10.9	9.1
Delay Adj:	1.00	1.00	1.00	1.00
ApprAdjDel:	13.2	10.0	10.9	9.1
LOS by Appr:	B	A	B	A
AllWayAvgQ:	0.1 1.0 0.0	0.0 0.3 0.5	0.4 0.4 0.4	0.0 0.0 0.0

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

**FUTURE WITH PROJECT
MITIGATED CONDITIONS**

Metro Union Bus Maintenance Facility
 City of Los Angeles
 Traffic Impact Analysis

Level Of Service Computation Report

Circular 212 Planning Method (Future Volume Alternative)

Intersection #8 Vignes at Cesar Chavez

Cycle (sec): 100 Critical Vol./Cap.(X): 0.723
 Loss Time (sec): 0 (Y+R=4.0 sec) Average Delay (sec/veh): xxxxxx
 Optimal Cycle: 82 Level Of Service: C

Street Name:	Vignes St						Cesar Chavez Ave					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Prot+Permit			Prot+Permit		
Rights:	Ovl			Ovl			Ovl			Ovl		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2	0	2	0	2	1	1	0	2	0	2	1

Volume Module:

Base Vol:	146	250	95	124	272	54	139	602	141	270	1277	192
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	146	250	95	124	272	54	139	602	141	270	1277	192
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	146	250	95	124	272	54	139	602	141	270	1277	192
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	146	250	95	124	272	54	139	602	141	270	1277	192
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	146	250	95	124	272	54	139	602	141	270	1277	192
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.10	1.00	1.00	1.10	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	161	250	95	136	272	54	139	602	141	270	1277	192

Saturation Flow Module:

Sat/Lane:	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	2.00	2.00	1.00	2.00	2.00	1.00	1.00	2.00	1.00	1.00	2.00	1.00
Final Sat.:	2750	2750	1375	2750	2750	1375	1375	2750	1375	1375	2750	1375

Capacity Analysis Module:

Vol/Sat:	0.06	0.09	0.07	0.05	0.10	0.04	0.10	0.22	0.10	0.20	0.46	0.14
Crit Volume:	80			136			139			639		
Crit Moves:	****			****			****			****		

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Level Of Service Computation Report
Circular 212 Planning Method (Future Volume Alternative)
*****
Intersection #8 Vignes at Cesar Chavez
*****
Cycle (sec):          100          Critical Vol./Cap.(X):          0.813
Loss Time (sec):      0 (Y+R=4.0 sec)  Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        122          Level Of Service:              D
*****
Street Name:          Vignes St          Cesar Chavez Ave
Approach:             North Bound      South Bound      East Bound      West Bound
Movement:             L - T - R      L - T - R      L - T - R      L - T - R
-----|-----|-----|-----|
Control:              Protected      Protected      Prot+Permit      Prot+Permit
Rights:               Ovl          Ovl          Ovl          Ovl
Min. Green:           0 0 0        0 0 0        0 0 0        0 0 0
Lanes:                2 0 2 0 1    2 0 2 0 1    1 0 2 0 1    1 0 2 0 1
-----|-----|-----|-----|
Volume Module:
Base Vol:             207 495 216 273 215 81 107 1193 139 124 801 132
Growth Adj:           1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse:          207 495 216 273 215 81 107 1193 139 124 801 132
Added Vol:            0 0 0        0 0 0        0 0 0        0 0 0
PasserByVol:         0 0 0        0 0 0        0 0 0        0 0 0
Initial Fut:          207 495 216 273 215 81 107 1193 139 124 801 132
User Adj:             1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj:              1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume:           207 495 216 273 215 81 107 1193 139 124 801 132
Reduct Vol:           0 0 0        0 0 0        0 0 0        0 0 0
Reduced Vol:          207 495 216 273 215 81 107 1193 139 124 801 132
PCE Adj:              1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj:              1.10 1.00 1.00 1.10 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume:          228 495 216 300 215 81 107 1193 139 124 801 132
-----|-----|-----|-----|
Saturation Flow Module:
Sat/Lane:             1375 1375 1375 1375 1375 1375 1375 1375 1375 1375 1375 1375
Adjustment:           1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes:                2.00 2.00 1.00 2.00 2.00 1.00 1.00 2.00 1.00 1.00 2.00 1.00
Final Sat.:           2750 2750 1375 2750 2750 1375 1375 2750 1375 1375 2750 1375
-----|-----|-----|-----|
Capacity Analysis Module:
Vol/Sat:              0.08 0.18 0.16 0.11 0.08 0.06 0.08 0.43 0.10 0.09 0.29 0.10
Crit Volume:          248          150          597          124
Crit Moves:           ****          ****          ****          ****
*****

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APPENDIX B

Air Quality

Urbemis 2007 Version 9.2.2

Emissions Reports (Pounds/Day)

File Name: J:\Projects\MTA Union Division Bus Maintenance & Operations Facility 2006-071\AQN\Air Quality\Construction\MTA Construction.urb9

Project Name: MTA Construction

Project Location: Los Angeles County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10 Dust</u>	<u>PM10 Exhaust</u>	<u>PM10</u>	<u>PM2.5 Dust</u>	<u>PM2.5 Exhaust</u>	<u>PM2.5</u>	<u>CO2</u>
2008 TOTALS (lbs/day unmitigated)	7.60	75.32	71.90	0.09	0.36	3.79	3.95	0.12	3.48	3.54	11,597.96
2009 TOTALS (lbs/day unmitigated)	66.95	60.67	67.18	0.09	0.36	2.68	3.04	0.12	2.46	2.58	11,596.53

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10 Dust</u>	<u>PM10 Exhaust</u>	<u>PM10</u>	<u>PM2.5 Dust</u>	<u>PM2.5 Exhaust</u>	<u>PM2.5</u>	<u>CO2</u>
Time Slice 5/1/2008-5/30/2008 Active Days: 22	4.72	45.40	21.78	0.03	0.00	2.46	2.46	0.00	2.27	2.27	4,713.86
Demolition 05/01/2008-05/31/2008	4.72	45.40	21.78	0.03	0.00	2.46	2.46	0.00	2.27	2.27	4,713.86
Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Demo Off Road Diesel	2.52	17.92	9.26	0.00	0.00	1.22	1.22	0.00	1.12	1.12	1,449.85
Demo On Road Diesel	2.16	27.40	11.27	0.03	0.10	1.24	1.34	0.03	1.14	1.17	3,139.56
Demo Worker Trips	0.04	0.08	1.24	0.00	0.01	0.00	0.01	0.00	0.00	0.00	124.45
Time Slice 6/2/2008-7/31/2008 Active Days: 44	7.48	75.32	33.68	0.05	0.17	3.79	3.95	0.05	3.48	3.54	7,937.02
Mass Grading 06/01/2008-07/31/2008	7.48	75.32	33.68	0.05	0.17	3.79	3.95	0.05	3.48	3.54	7,937.02

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Mass Grading Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Off Road Diesel	4.17	34.10	14.90	0.00	0.00	1.92	1.92	0.00	1.77	1.77	3,041.01
Mass Grading On Road Diesel	3.24	41.10	16.91	0.04	0.16	1.86	2.01	0.05	1.71	1.76	4,709.33
Mass Grading Worker Trips	0.06	0.12	1.87	0.00	0.01	0.00	0.01	0.00	0.00	0.01	186.67
Time Slice 8/1/2008-12/31/2008 Active Days: 109	<u>7.60</u>	64.61	<u>71.90</u>	<u>0.09</u>	<u>0.36</u>	2.91	3.26	<u>0.12</u>	2.66	2.79	<u>11,597.96</u>
Building 08/01/2008-06/14/2009	7.60	64.61	71.90	0.09	0.36	2.91	3.26	0.12	2.66	2.79	11,597.96
Building Off Road Diesel	3.11	24.27	10.25	0.00	0.00	1.09	1.09	0.00	1.00	1.00	2,483.82
Building Vendor Trips	3.34	38.23	27.40	0.05	0.20	1.73	1.92	0.07	1.59	1.65	5,689.66
Building Worker Trips	1.15	2.11	34.25	0.04	0.16	0.09	0.25	0.06	0.08	0.13	3,424.47
Time Slice 1/1/2009-6/12/2009 Active Days: 117	7.11	<u>60.67</u>	<u>67.18</u>	<u>0.09</u>	<u>0.36</u>	<u>2.68</u>	<u>3.04</u>	<u>0.12</u>	<u>2.46</u>	<u>2.58</u>	<u>11,596.53</u>
Building 08/01/2008-06/14/2009	7.11	60.67	67.18	0.09	0.36	2.68	3.04	0.12	2.46	2.58	11,596.53
Building Off Road Diesel	2.93	22.81	9.73	0.00	0.00	1.02	1.02	0.00	0.94	0.94	2,483.82
Building Vendor Trips	3.13	35.92	25.49	0.05	0.20	1.57	1.76	0.07	1.44	1.51	5,689.94
Building Worker Trips	1.04	1.94	31.96	0.04	0.16	0.09	0.25	0.06	0.08	0.14	3,422.77
Time Slice 6/15/2009-6/30/2009 Active Days: 12	2.54	14.89	8.94	0.00	0.01	1.28	1.29	0.00	1.18	1.18	1,162.00
Asphalt 06/15/2009-07/01/2009	2.54	14.89	8.94	0.00	0.01	1.28	1.29	0.00	1.18	1.18	1,162.00
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	2.50	14.82	7.78	0.00	0.00	1.28	1.28	0.00	1.18	1.18	1,037.62
Paving On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Worker Trips	0.04	0.07	1.16	0.00	0.01	0.00	0.01	0.00	0.00	0.00	124.39
Time Slice 7/1/2009-7/1/2009 Active Days: 1	<u>66.95</u>	14.95	9.81	0.00	0.01	1.28	1.30	0.00	1.18	1.19	1,255.46
Asphalt 06/15/2009-07/01/2009	2.54	14.89	8.94	0.00	0.01	1.28	1.29	0.00	1.18	1.18	1,162.00
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	2.50	14.82	7.78	0.00	0.00	1.28	1.28	0.00	1.18	1.18	1,037.62

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Paving On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Worker Trips	0.04	0.07	1.16	0.00	0.01	0.00	0.01	0.00	0.00	0.00	124.39
Coating 07/01/2009-11/30/2009	64.41	0.05	0.87	0.00	0.00	0.00	0.01	0.00	0.00	0.00	93.46
Architectural Coating	64.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.03	0.05	0.87	0.00	0.00	0.00	0.01	0.00	0.00	0.00	93.46
Time Slice 7/2/2009-11/30/2009	64.41	0.05	0.87	0.00	0.00	0.00	0.01	0.00	0.00	0.00	93.46
Active Days: 108											
Coating 07/01/2009-11/30/2009	64.41	0.05	0.87	0.00	0.00	0.00	0.01	0.00	0.00	0.00	93.46
Architectural Coating	64.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.03	0.05	0.87	0.00	0.00	0.00	0.01	0.00	0.00	0.00	93.46

Phase Assumptions

Phase: Demolition 5/1/2008 - 5/31/2008 - Default Demolition Description

Building Volume Total (cubic feet): 189007.5

Building Volume Daily (cubic feet): 32000

On Road Truck Travel (VMT): 740.74

Off-Road Equipment:

2 Rubber Tired Loaders (164 hp) operating at a 0.54 load factor for 8 hours per day

2 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 6 hours per day

Phase: Mass Grading 6/1/2008 - 7/31/2008 - Default Mass Site Grading/Excavation Description

Total Acres Disturbed: 0

Maximum Daily Acreage Disturbed: 0

Fugitive Dust Level of Detail: Default

0 lbs per acre-day

On Road Truck Travel (VMT): 1111.11

Off-Road Equipment:

1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Other Equipment (190 hp) operating at a 0.62 load factor for 8 hours per day

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2 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Paving 6/15/2009 - 7/1/2009 - Default Paving Description

Acres to be Paved: 0

Off-Road Equipment:

1 Pavers (100 hp) operating at a 0.62 load factor for 7 hours per day

2 Paving Equipment (104 hp) operating at a 0.53 load factor for 6 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 7 hours per day

Phase: Building Construction 8/1/2008 - 6/14/2009 - Default Building Construction Description

Off-Road Equipment:

1 Cranes (399 hp) operating at a 0.43 load factor for 6 hours per day

2 Forklifts (145 hp) operating at a 0.3 load factor for 6 hours per day

1 Generator Sets (49 hp) operating at a 0.74 load factor for 8 hours per day

2 Other Equipment (190 hp) operating at a 0.62 load factor for 8 hours per day

Phase: Architectural Coating 7/1/2009 - 11/30/2009 - Default Architectural Coating Description

Rule: Residential Interior Coatings begins 1/1/2005 ends 6/30/2008 specifies a VOC of 100

Rule: Residential Interior Coatings begins 7/1/2008 ends 12/31/2040 specifies a VOC of 50

Rule: Residential Exterior Coatings begins 1/1/2005 ends 6/30/2008 specifies a VOC of 250

Rule: Residential Exterior Coatings begins 7/1/2008 ends 12/31/2040 specifies a VOC of 100

Rule: Nonresidential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Demolition Fugitive Dust

	Construction Activity
	Demolition of Existing 327,592 Square Foot ^a
Demolition Schedule -	22 days ^a

Fugitive Dust Material Handling			
Aerodynamic Particle Size Multiplier^b	Mean Wind Speed^c	Moisture Content^d	Debris Handled^e
	mph		ton/day
0.35	4.68	2.0	685

Incremental Increase in Onsite Fugitive Dust Emissions from Construction Equipment			
Material Handling ^f : $(0.0032 \times \text{Aerodynamic Particle Size Multiplier} \times (\text{wind speed (mph)}/5)^{1.3}/(\text{moisture content}/2)^{1.4} \times \text{debris handled (ton/day)}) \times$			
Description	Control Efficiency	PM10 Mitigated^h	PM2.5 Mitigated^h
	%	lb/day	lb/day
Material Handling (Demolition) ^g	61	0.27	0.056
Material Handling (Debris)	61	0.27	0.056
Total		0.54	0.11

$(1 - \text{control efficiency}) = \text{PM10 Emissions (lb/day)}$

Notes:

Project specific data may be entered into shaded cells. Changing the values in the shaded cells will not affect the integrity of the worksheets. Verify that units of values entered match units for cell.

Adding lines or entering values with units different than those associated with the shaded cells may alter the integrity of the sheets or produce incorrect results.

a) Size of the parking lot to be removed.

b) USEPA, AP-42, Jan 1995, Section 13.2.4 Aggregate Handling and Storage Piles, p 13.2.4-3 Aerodynamic particle size multiplier for < 10 μm

c) Mean wind speed at the Downtown Los Angeles Monitoring Station.

d) USEPA, Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, equation 2-13, p 2-28

e) USEPA, Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, p 2-28. Debris weight to area ratio = 0.046 ton/sq ft

$(327,592 \text{ sq. ft} \times 0.046 \text{ ton/sq ft})/22 \text{ days} = 685 \text{ ton/day}$

f) USEPA, Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, equation 2-13, p 2-28. EPA suggests using the material handling equation for demolition emission estimates.

g) EPA suggests using the material handling equation for demolition emission estimates.

h) Includes watering at least three times a day per Rule 403 (61% control efficiency)

Site Preparation/Grading Fugitive Dust

Construction Activity	
Grading	327,590 Square Feet ^a
Grading Schedule -	1 days^a

Fugitive Dust Grading Parameters	
Vehicle Speed (mph)^b	Vehicle Miles Traveled^c
3	5.64

Fugitive Dust Stockpiling Parameters				
Silt Content^d	Precipitation Days^e	Mean Wind Speed Percent^f	TSP Fraction	Area^g (acres)
6.9	10	2.6	0.5	0.21

Fugitive Dust Material Handling				
Aerodynamic Particle Size Multiplier^h	Mean Wind Speedⁱ	Moisture Content	Dirt Handled^j	Dirt Handled
0.35	4.68 mph	7.9	682 cy	1,705,000 lb/day

Incremental Increase in Fugitive Dust Emissions from Construction Operations				
Equations:				
Grading ^k : PM10 Emissions (lb/day) = 0.60 x 0.051 x mean vehicle speed ^{2.0} x VMT x (1 - control efficiency)				
Storage Piles ^l : PM10 Emissions (lb/day) = 1.7 x (silt content/1.5) x ((365-precipitation days)/235) x wind speed percent/15 x TSP fraction x Area) x (1 - control efficiency)				
Material Handling ^m : PM10 Emissions (lb/day) = (0.0032 x aerodynamic particle size multiplier x (wind speed (mph)/5) ^{1.3} /(moisture content/2) ^{1.4} x dirt handled (lb/day)/2,000 (lb/ton)				
		Control Efficiencyⁿ	Unmitigated PM₁₀	Unmitigated PM_{2.5}
Description		%	lb/day	lb/day
Earthmoving		61	0.61	0.13
Storage Piles		61	0.08	0.02
Material Handling		61	0.05	0.01
Total			0.74	0.15

Notes:

Project specific data may be entered into shaded cells. Changing the values in the shaded cells will not affect the integrity of the worksheets. Verify that units of values entered match units for cell.

Adding lines or entering values with units different than those associated with the shaded cells may alter the integrity of the sheets or produce incorrect results.

a) Assumed a maximum of five acres would be graded per day.

b) Caterpillar Performance Handbook, Edition 33, October 2003 Operating Speeds, p 2-3.

c) Based on the size of the project site.

d) USEPA, AP-42, July 1998, Table 11.9-3 Typical Values for Correction Factors Applicable to the Predictive Emission Factor Equations.

e) USEPA, AP-42, July 1998, Table 11.9-3 Typical Values for Correction Factors Applicable to the Predictive Emission Factor Equations.

f) Table A9-9-E2, SCAQMD CEQA Air Quality Handbook, 1993.

g) Mean wind speed percent - percent of time mean wind speed exceeds 12 mph.

h) Assumed storage piles are 0.21 acres in size.

i) USEPA, AP-42, Jan 1995, Section 13.2.4 Aggregate Handling and Storage Piles, p 13.2.4-3 Aerodynamic particle size multiplier for < 10 µm.

j) Mean wind speed at the Downtown Los Angeles Station.

k) Assumed 43 20-cubic yard trucks per day.

l) USEPA, AP-42, July 1998, Table 11.9-1, Equation for Site Grading ≤ 10 µm

m) USEPA, AP-42, Jan 1995, Section 13.2.4 Aggregate Handling and Storage Piles, Equation 1

n) USEPA, Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, Sept 1992, EPA-450/2-92-004, Equation 2-12

o) Includes a 61% control efficiency for SCAQMD Rule 403.

CO Concentrations
 MTA Union Division Bus Maintenance & Facility 2006-071

2007 Existing

Intersection	Peak Time	Value	Parts Per Million	
			1-hour	8-hour
Cesar Chavez Ave / Alameda St	PM	1.1	5.1	4.0
Cesar Chavez Ave / Vignes St St	PM	0.9	4.9	3.8

2009 No Project

Intersection	Peak Time	Value	Parts Per Million	
			1-hour	8-hour
Cesar Chavez Ave / Alameda St	PM	1.1	4.50	3.5
Cesar Chavez Ave / Vignes St St	PM	0.9	4.30	3.4

2009 Project

Intersection	Peak Time	Value	Parts Per Million	
			1-hour	8-hour
Cesar Chavez Ave / Alameda St	PM	1.1	4.50	3.5
Cesar Chavez Ave / Vignes St St	PM	0.9	4.30	3.4

State Standard

20	9
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TAHA CO ANALYSIS ASSUMPTIONS & INPUTS

Project:	MTA Union Division Bus Maintenance & Facility
Project Number:	2006-071
Existing Year:	2007
Analysis Year:	2009
Existing VMT (from EMFAC2002):	217,704,000
Project VMT (from EMFAC2002):	219,571,000
EMFAC Model:	EMFAC2007
Existing CO Emissions:	1,403.320
Project Year CO Emissions:	1,181.420
Persistence Factor:	0.7
Existing 1-Hr Ambient CO Concentration (ppm):	4.00
Existing 8-Hr Ambient CO Concentration (ppm):	3.20

EMFAC Assumptions	
Season/Month:	Winter
Temperature:	60
Speed:	20 mph
Source: Transportation Project-Level Carbon Monoxide Protocol, 12/1997	

CAL3QHC INPUTS			
Project Scenario:	Existing	Future Pre-Project	Future Project
Project Year:	2007	2009	2009
Average Time (minutes):	60	60	60
Surface Roughness Factor:	100	100	100
Emissions Factor - Free Flow Link (g/veh-mile):	5.25	4.36	4.36
Emissions Factor - Idle (g/veh-hr):	5.52	5.58	5.58
Saturation Flow Rate (veh/hr):	1600	1600	1600
Receptor Height (Z-Coordinate) (feet):	5.4	5.4	5.4
Wind Speed (m/s):	1	1	1
Stability Class:	F	F	F
Ambient 1-Hr CO Concentration (ppm):	4.00	3.40	3.40
Ambient 8-Hr CO Concentration (ppm):	3.20	2.72	2.72

Weekday Analyzed Intersections:	CAL3QHC names			Scenario:
	Existing	No Project	Project	
Alameda St / Cesar Chavez Ave	ALCEEX	ALCENP	ALCEPA	PM
Vignes St / Cesar Chavez Ave	VICEEX	VICENP	VICEPA	PM

Title : MTAUNIONSTATIONBUSMAINTENANCE&OPERATIONSFACILITY
 Version : Emfac2007 V2.3 Nov 1 2006
 Run Date : 2007/12/13 12:13:44
 Scen Year: 2007 -- All model years in the range 1965 to 2007 selected
 Season : Winter
 Area : Los Angeles County Average
 I/M Stat : Enhanced Interim (2005) -- Using I/M schedule for area 59 Los Angeles (SC)
 Emissions: Tons Per Day

	Light Duty Trucks			Medium Duty Trucks			Heavy Duty Trucks			Urban Buses	Motor-cycles	All Vehicles								
	Cat	Diesel	Total	Non-cat	Cat	Diesel	Total	Non-cat	Cat				Diesel	Total						
Vehicles	64175.	3266660.	11439.	3342270.	32963.	1689430.	14503.	1736890.	10579.	653216.	23033.	686828.	6987.	52159.	59146.	71848.	130994.	4252.	134452.	6035690.
VMT/1000	1066.	113578.	256.	114901.	786.	63519.	477.	64782.	241.	26025.	1242.	27508.	68.	1399.	1467.	7594.	9060.	463.	990.	217704.
Trips	262296.	20690800.	63936.	21017000.	137144.	10737000.	89444.	10963600.	98150.	6416110.	276367.	6790620.	116116.	717466.	833583.	1289430.	2123010.	17008.	268877.	41180100.
Non-cat																				
Run Exh	7.65	10.15	0.06	17.86	5.84	7.33	0.06	13.23	1.92	5.87	0.23	8.01	0.54	1.59	2.12	9.16	11.28	0.62	4.07	55.07
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.12	0.01	0.04	0.04	0.69	0.74	0.00	0.00	0.86
Start Ex	1.52	13.29	0.00	14.81	0.80	7.32	0.00	8.12	0.68	6.41	0.00	7.09	1.50	1.35	2.85	0.00	2.85	0.02	0.75	33.64
Total Ex	9.17	23.45	0.06	32.67	6.64	14.65	0.06	21.35	2.60	12.39	0.23	15.22	2.04	2.97	5.01	9.85	14.87	0.64	4.82	89.57
Diurnal	0.52	3.61	0.00	4.13	0.27	1.64	0.00	1.91	0.03	0.60	0.00	0.62	0.01	0.02	0.02	0.00	0.02	0.00	0.38	7.07
Hot Soak	1.19	5.08	0.00	6.27	0.63	2.28	0.00	2.91	0.13	0.98	0.00	1.11	0.08	0.03	0.11	0.00	0.11	0.00	0.24	10.65
Running	5.72	15.05	0.00	20.77	1.98	11.50	0.00	13.48	0.39	6.15	0.00	6.54	0.64	0.40	1.04	0.00	1.04	0.02	1.13	42.98
Resting	0.25	1.49	0.00	1.73	0.13	0.70	0.00	0.83	0.01	0.26	0.00	0.28	0.00	0.00	0.01	0.00	0.01	0.00	0.14	2.99
Total	16.85	48.67	0.06	65.58	9.64	30.79	0.06	40.49	3.15	20.39	0.23	23.77	2.77	3.42	6.19	9.85	16.05	0.66	6.72	153.25
Run Exh	90.24	321.64	0.26	412.13	66.72	245.00	0.37	312.09	34.05	125.29	1.18	160.52	15.62	28.97	44.59	39.47	84.06	4.55	53.50	1026.86
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.72	0.02	0.76	0.03	0.24	0.27	3.18	3.44	0.00	0.00	4.20
Start-Ex	8.74	147.07	0.00	155.82	4.64	90.27	0.00	94.90	5.12	76.91	0.00	82.04	14.33	22.10	36.43	0.00	36.43	0.28	2.80	372.26
Total Ex	98.98	468.71	0.26	567.95	71.36	335.26	0.37	406.99	39.19	202.93	1.20	243.32	29.99	51.30	81.29	42.65	123.94	4.83	56.30	1403.32
Run Exh	5.62	36.27	0.44	42.34	4.11	37.02	0.82	41.96	1.73	24.45	9.20	35.39	0.49	7.32	7.81	144.12	151.93	10.10	1.57	283.28
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.06	0.07	0.00	0.00	0.00	4.75	4.75	0.00	0.00	4.82
Start-Ex	0.41	9.46	0.00	9.87	0.21	7.64	0.00	7.85	0.14	9.71	0.00	9.85	0.23	2.75	2.99	0.00	2.99	0.03	0.09	30.68
Total Ex	6.04	45.74	0.44	52.21	4.33	44.66	0.82	49.81	1.87	34.17	9.26	45.31	0.72	10.08	10.80	148.87	159.67	10.13	1.66	318.78
Run Exh	0.64	49.54	0.10	50.28	0.47	34.21	0.18	34.86	0.18	19.34	0.71	20.23	0.05	1.05	1.10	14.45	15.55	1.21	0.14	122.27
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.03	0.00	0.01	0.01	0.29	0.30	0.00	0.00	0.32
Start-Ex	0.06	1.68	0.00	1.73	0.03	1.07	0.00	1.10	0.02	0.61	0.00	0.63	0.03	0.03	0.05	0.00	0.05	0.00	0.02	3.53
Total Ex	0.69	51.21	0.10	52.01	0.50	35.28	0.18	35.96	0.21	19.97	0.71	20.89	0.08	1.08	1.16	14.74	15.90	1.22	0.15	126.13
Run Exh	0.04	1.38	0.05	1.47	0.03	1.53	0.04	1.60	0.01	0.63	0.06	0.70	0.00	0.01	0.02	5.98	5.99	0.15	0.05	9.96
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.13	0.00	0.00	0.13
Start-Ex	0.00	0.13	0.00	0.13	0.00	0.12	0.00	0.13	0.00	0.06	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.33
Total Ex	0.05	1.51	0.05	1.60	0.03	1.65	0.04	1.72	0.01	0.69	0.06	0.76	0.00	0.02	0.02	6.11	6.13	0.15	0.06	10.42
TireWear	0.01	1.00	0.00	1.01	0.01	0.56	0.00	0.57	0.00	0.25	0.02	0.27	0.00	0.02	0.02	0.22	0.24	0.00	0.00	2.10
BrakeWear	0.01	1.57	0.00	1.59	0.01	0.88	0.01	0.90	0.00	0.36	0.02	0.38	0.00	0.02	0.02	0.18	0.21	0.01	0.01	3.09
Reactive Organic Gas Emissions	0.07	4.08	0.05	4.20	0.05	3.09	0.05	3.19	0.02	1.30	0.10	1.41	0.00	0.06	0.06	6.51	6.58	0.16	0.07	15.61
Total																				
Lead	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SOx	0.01	0.50	0.00	0.51	0.01	0.34	0.00	0.35	0.00	0.20	0.01	0.20	0.00	0.01	0.01	0.14	0.15	0.01	0.00	1.23
Gasoline	90.02	5327.09	0.00	5417.11	64.80	3670.72	0.00	3735.51	28.17	2081.35	0.00	2109.52	13.39	120.24	133.63	0.00	133.63	9.39	26.34	11431.51
Diesel	0.00	0.00	9.29	9.29	0.00	0.00	16.51	16.51	0.00	0.00	64.18	64.18	0.00	0.00	0.00	1326.66	1326.66	101.62	0.00	1518.26

Title : MTAUNIONSTATIONBUSMAINTENANCE&OPERATIONSFACILITY
 Version : Emfac2007 V2.3 Nov 1 2006
 Run Date : 2007/12/13 12:13:44
 Scen Year: 2009 -- All model years in the range 1965 to 2009 selected
 Season : Winter
 Carbon Monoxide Emissions

Oxides of Nitrogen Emissions

Area : Los Angeles County Average
 I/M Stat : Enhanced Interim (2005) -- Using I/M schedule for area 59 Los Angeles (SC)
 Emissions: Tons Per Day

	Light Duty Passenger Cars			Medium Duty Trucks			Heavy Duty Trucks			Urban Buses	Motor-cycles	All Vehicles								
	Cat	Diesel	Total	Non-cat	Cat	Diesel	Total	Non-cat	Cat				Diesel	Total						
Vehicles	44054.	3371680.	8857.	3424590.	23502.	1732500.	12812.	1768820.	8316.	667753.	24743.	700812.	4893.	54503.	59396.	75827.	135223.	4314.	136965.	6170720.
VMT/1000	716.	115346.	193.	116255.	553.	64002.	407.	64962.	184.	25997.	1290.	27471.	47.	1389.	1436.	7966.	9402.	470.	1011.	219571.
Trips	176163.	21315100.	48053.	21539400.	95625.	10973700.	78140.	11147500.	72943.	6562350.	299360.	6934660.	89432.	713524.	802956.	1358240.	2161200.	17256.	273904.	42073800.
Non-cat																				
Run Exh	5.12	7.89	0.04	13.05	4.12	5.99	0.04	10.15	1.50	4.86	0.23	6.59	0.38	1.39	1.77	8.57	10.34	0.58	3.85	44.56
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.13	0.00	0.04	0.04	0.66	0.71	0.00	0.00	0.83
Start Ex	1.02	11.03	0.00	12.05	0.56	6.30	0.00	6.85	0.50	5.75	0.00	6.25	1.14	1.28	2.42	0.00	2.42	0.02	0.73	28.32
Total Ex	6.14	18.92	0.04	25.10	4.67	12.28	0.04	17.00	2.01	10.72	0.23	12.96	1.52	2.71	4.23	9.24	13.46	0.60	4.58	73.71
Diurnal	0.36	3.17	0.00	3.53	0.19	1.51	0.00	1.70	0.02	0.55	0.00	0.57	0.00	0.01	0.02	0.00	0.02	0.00	0.36	6.19
Hot Soak	0.80	4.80	0.00	5.60	0.44	2.27	0.00	2.71	0.10	0.96	0.00	1.06	0.06	0.03	0.09	0.00	0.09	0.00	0.19	9.66
Running	3.80	13.06	0.00	16.86	1.32	11.22	0.00	12.54	0.28	6.03	0.00	6.31	0.49	0.40	0.89	0.00	0.89	0.02	0.88	37.50
Resting	0.17	1.43	0.00	1.60	0.09	0.71	0.00	0.80	0.01	0.26	0.00	0.27	0.00	0.00	0.01	0.00	0.01	0.00	0.13	2.80
Total	11.26	41.38	0.04	52.69	6.71	27.99	0.04	34.75	2.41	18.53	0.23	21.17	2.09	3.15	5.24	9.24	14.47	0.62	6.15	129.86
Run Exh	60.17	271.73	0.19	332.10	46.80	212.67	0.31	259.78	26.07	108.51	1.24	135.81	11.41	25.63	37.04	36.99	74.03	4.32	47.17	853.21
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.74	0.02	0.77	0.02	0.23	0.26	3.24	3.50	0.00	0.00	4.27
Start Ex	5.86	126.79	0.00	132.64	3.23	80.15	0.00	83.39	3.81	68.64	0.00	72.45	11.36	20.92	32.29	0.00	32.29	0.27	2.90	323.94
Total Ex	66.03	398.52	0.19	464.74	50.04	292.82	0.31	343.16	29.89	177.88	1.26	209.03	22.80	46.79	69.59	40.23	109.82	4.59	50.08	1181.42
Run Exh	3.78	29.61	0.33	33.72	2.90	30.90	0.70	34.51	1.35	20.71	8.91	30.96	0.36	6.51	6.87	134.07	140.94	9.83	1.54	251.51
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.07	0.07	0.00	0.00	0.00	5.18	5.18	0.00	0.00	5.26
Start Ex	0.28	8.30	0.00	8.58	0.15	6.82	0.00	6.97	0.11	9.61	0.00	9.72	0.18	2.66	2.84	0.00	2.84	0.03	0.09	28.23
Total Ex	4.06	37.91	0.33	42.30	3.05	37.73	0.70	41.48	1.46	30.33	8.97	40.76	0.54	9.17	9.71	139.25	148.97	9.85	1.64	285.00
Run Exh	0.42	49.69	0.08	50.19	0.33	34.28	0.16	34.76	0.14	19.19	0.74	20.07	0.04	1.04	1.07	15.14	16.22	1.21	0.15	122.60
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.03	0.00	0.01	0.01	0.30	0.31	0.00	0.00	0.34
Start Ex	0.04	1.71	0.00	1.75	0.02	1.09	0.00	1.11	0.02	0.62	0.00	0.64	0.02	0.03	0.05	0.00	0.05	0.00	0.02	3.57
Total Ex	0.46	51.40	0.08	51.94	0.35	35.37	0.16	35.88	0.16	19.84	0.74	20.74	0.06	1.07	1.13	15.45	16.58	1.21	0.17	126.51
Run Exh	0.03	1.44	0.03	1.50	0.02	1.62	0.03	1.67	0.01	0.67	0.06	0.74	0.00	0.01	0.02	5.47	5.48	0.15	0.04	9.58
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.12	0.00	0.00	0.12
Start Ex	0.00	0.13	0.00	0.14	0.00	0.13	0.00	0.13	0.00	0.06	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.34
Total Ex	0.03	1.57	0.03	1.64	0.02	1.75	0.03	1.80	0.01	0.73	0.06	0.80	0.00	0.02	0.02	5.58	5.60	0.15	0.05	10.04
TireWear	0.01	1.02	0.00	1.03	0.00	0.56	0.00	0.57	0.00	0.25	0.02	0.27	0.00	0.02	0.02	0.23	0.25	0.00	0.00	2.13
BrakeWear	0.01	1.59	0.00	1.61	0.01	0.88	0.01	0.90	0.00	0.36	0.02	0.38	0.00	0.02	0.02	0.19	0.22	0.01	0.01	3.12
Reactive Organic Gas Emissions	0.05	4.18	0.04	4.27	0.04	3.20	0.04	3.28	0.01	1.34	0.10	1.45	0.00	0.06	0.06	6.01	6.07	0.16	0.06	15.28
Total																				
Lead	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SOx	0.01	0.50	0.00	0.51	0.00	0.34	0.00	0.35	0.00	0.19	0.01	0.20	0.00	0.01	0.01	0.15	0.16	0.01	0.00	1.23
Gasoline	60.08	5333.14	0.00	5393.22	45.37	3672.62	0.00	3717.99	21.46	2063.40	0.00	2084.86	9.89	118.42	128.32	0.00	128.32	10.03	27.00	11361.42
Diesel	0.00	0.00	6.96	6.96	0.00	0.00	14.07	14.07	0.00	0.00	66.65	66.65	0.00	0.00	0.00	1390.29	1390.29	100.62	0.00	1578.59

Carbon Monoxide Emissions

Oxides of Nitrogen Emissions

Carbon Dioxide Emissions (000)

PAGE 1

JOB: AlamedaCesarChavezPM

RUN: CAL3QHC RUN

DATE : 12/13/ 7

TIME : 16:29:39

The MODE flag has been set to C for calculating CO averages.

SITE & METEOROLOGICAL VARIABLES

VS = .0 CM/S VD = .0 CM/S Z0 = 100. CM
 U = 1.0 M/S CLAS = 6 (F) ATIM = 60. MINUTES MIXH = 1000. M AMB =
 .0 PPM

LINK VARIABLES

EF	LINK DESCRIPTION				LINK COORDINATES (FT)				* LENGTH (FT)	BRG (DEG)	TYPE	VPH
	H	W	V/C	QUEUE	X1	Y1	X2	Y2				
(G/MI)	(FT)	(FT)	(VEH)									
5.3	1. nba				524.0	.0	524.0	500.0	500.	360.	AG	1126.
5.3	.0 68.0				524.0	500.0	524.0	1000.0	500.	360.	AG	1071.
5.3	2. nbd				476.0	1000.0	476.0	500.0	500.	180.	AG	818.
5.3	.0 68.0				476.0	500.0	476.0	.0	500.	180.	AG	934.
5.3	3. sba				.0	476.0	500.0	476.0	500.	90.	AG	1259.
5.3	.0 68.0				500.0	476.0	1000.0	476.0	500.	90.	AG	1136.
5.3	4. sbd				1000.0	524.0	500.0	524.0	500.	270.	AG	931.
5.3	.0 68.0				500.0	524.0	.0	524.0	500.	270.	AG	993.
5.3	5. eba				524.0	452.0	524.0	405.9	46.	180.	AG	30.
100.0	.0 48.0	.42	2.3		476.0	548.0	476.0	581.5	33.	360.	AG	30.
100.0	6. ebd				452.0	476.0	405.6	476.0	46.	270.	AG	27.
100.0	.0 48.0	.31	1.7		548.0	524.0	582.3	524.0	34.	90.	AG	27.
100.0	7. wba											
100.0	.0 48.0	.42	2.4									
100.0	8. wbd											
100.0	.0 48.0	.31	1.7									
100.0	9. nbq											
100.0	.0 48.0	.42	2.3									
100.0	10. sbq											
100.0	.0 48.0	.31	1.7									
100.0	11. ebq											
100.0	.0 48.0	.42	2.4									
100.0	12. wbq											
100.0	.0 48.0	.31	1.7									

ADDITIONAL QUEUE LINK PARAMETERS

ARRIVAL RATE	LINK DESCRIPTION	*	CYCLE	RED	CLEARANCE	APPROACH	SATURATION	IDLE	SIGNAL
			LENGTH (SEC)	TIME (SEC)	LOST TIME (SEC)	VOL (VPH)	FLOW RATE (VPH)	EM FAC (gm/hr)	TYPE
3	9. nbq	*	60	30	3.0	1126	1600	5.52	3
3	10. sbq	*	60	30	3.0	818	1600	5.52	3
3	11. ebq	*	60	27	3.0	1259	1600	5.52	3
3	12. wbq	*	60	27	3.0	931	1600	5.52	3

RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (FT)			*
	*	X	Y	Z	*

1. nw 10 ft	*	442.0	558.0	6.0	*
2. ne 10 ft	*	558.0	558.0	6.0	*
3. sw 10 ft	*	442.0	442.0	6.0	*
4. se 10 ft	*	558.0	442.0	6.0	*

JOB: AlamedaCesarChavezPM

RUN: CAL3QHC RUN

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-360.

WIND ANGLE (DEGR)	* RECI	* RECI	* RECI	* RECI
	REC1	REC2	REC3	REC4
0.	.2	.3	.7	.6
10.	.4	.1	1.0	.3
20.	.5	.0	.8	.3
30.	.4	.0	.7	.3
40.	.3	.0	.5	.3
50.	.2	.0	.8	.3
60.	.3	.0	.7	.4
70.	.3	.0	.8	.6
80.	.3	.0	.8	.6
90.	.6	.2	.7	.3
100.	.9	.5	.3	.1
110.	.7	.5	.2	.0
120.	.6	.4	.3	.0
130.	.7	.4	.3	.0
140.	.7	.3	.4	.0
150.	.7	.4	.4	.0
160.	.8	.3	.5	.0
170.	.9	.3	.5	.1
180.	.6	.8	.2	.3
190.	.4	.9	.0	.6
200.	.3	.7	.0	.6
210.	.4	.6	.0	.4
220.	.4	.7	.0	.4
230.	.4	.6	.0	.4
240.	.4	.7	.0	.4
250.	.5	.8	.0	.4
260.	.6	.9	.1	.4
270.	.3	.6	.3	.8
280.	.1	.3	.6	1.1
290.	.0	.3	.6	.8
300.	.0	.3	.5	.8
310.	.0	.3	.5	.7
320.	.0	.3	.4	.7
330.	.0	.4	.4	.7
340.	.0	.5	.4	.8
350.	.0	.5	.4	.8
360.	.2	.3	.7	.6
MAX	.9	.9	1.0	1.1
DEGR.	100	190	10	280

THE HIGHEST CONCENTRATION OF 1.10 PPM OCCURRED AT RECEPTOR REC4 .

CAL3QHC: LINE SOURCE DISPERSION MODEL - VERSION 2.0 Dated 95221

JOB: AlamedaCesarChavezno project

RUN: CAL3QHC RUN

DATE : 12/13/ 7

TIME : 16:35:29

The MODE flag has been set to C for calculating CO averages.

SITE & METEOROLOGICAL VARIABLES

VS = .0 CM/S VD = .0 CM/S ZO = 100. CM
 U = 1.0 M/S CLAS = 6 (F) ATIM = 60. MINUTES MIXH = 1000. M AMB =
 .0 PPM

LINK VARIABLES

EF	LINK DESCRIPTION				LINK COORDINATES (FT)				LENGTH (FT)	BRG TYPE (DEG)	VPH
	H	W	V/C	QUEUE	X1	Y1	X2	Y2			
(G/MI)	(FT)	(FT)	(VEH)	*	*	*	*	*	*	*	
4.4	1. nba				524.0	.0	524.0	500.0	500.	360. AG	1220.
	.0 68.0										
4.4	2. nbd				524.0	500.0	524.0	1000.0	500.	360. AG	1138.
	.0 68.0										
4.4	3. sba				476.0	1000.0	476.0	500.0	500.	180. AG	887.
	.0 68.0										
4.4	4. sbd				476.0	500.0	476.0	.0	500.	180. AG	1010.
	.0 68.0										
4.4	5. eba				.0	476.0	500.0	476.0	500.	90. AG	1435.
	.0 68.0										
4.4	6. ebd				500.0	476.0	1000.0	476.0	500.	90. AG	1304.
	.0 68.0										
4.4	7. wba				1000.0	524.0	500.0	524.0	500.	270. AG	1114.
	.0 68.0										
4.4	8. wbd				500.0	524.0	.0	524.0	500.	270. AG	1204.
	.0 68.0										
100.0	9. nbq				524.0	452.0	524.0	400.3	52.	180. AG	31.
	.0 48.0 .48 2.6										
100.0	10. sbq				476.0	548.0	476.0	585.5	37.	360. AG	31.
	.0 48.0 .35 1.9										
100.0	11. ebq				452.0	476.0	401.1	476.0	51.	270. AG	26.
	.0 48.0 .46 2.6										
100.0	12. wbq				548.0	524.0	587.5	524.0	40.	90. AG	26.
	.0 48.0 .36 2.0										

ADDITIONAL QUEUE LINK PARAMETERS

ARRIVAL RATE	LINK DESCRIPTION	*	CYCLE	RED	CLEARANCE	APPROACH	SATURATION	IDLE	SIGNAL
		*	(SEC)	(SEC)	(SEC)	(VPH)	(VPH)	(gm/hr)	
3	9. nbq	*	60	31	3.0	1220	1600	5.56	3
3	10. sbq	*	60	31	3.0	887	1600	5.56	3
3	11. ebq	*	60	26	3.0	1435	1600	5.56	3
3	12. wbq	*	60	26	3.0	1114	1600	5.56	3

RECEPTOR LOCATIONS

RECEPTOR * X Y Z *

1. nw 10 ft	*	442.0	558.0	6.0	*
2. ne 10 ft	*	558.0	558.0	6.0	*
3. sw 10 ft	*	442.0	442.0	6.0	*
4. se 10 ft	*	558.0	442.0	6.0	*

JOB: AlamedaCesarChavezno project

RUN: CAL3QHC RUN

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-360.

WIND ANGLE (DEGR)	* RECI	* RECI	* RECI	* RECI
	REC1	REC2	REC3	REC4
0.	.2	.3	.7	.6
10.	.4	.0	.9	.3
20.	.4	.0	.7	.3
30.	.3	.0	.6	.3
40.	.3	.0	.5	.3
50.	.3	.0	.6	.3
60.	.3	.0	.6	.4
70.	.3	.0	.7	.5
80.	.3	.0	.8	.5
90.	.6	.2	.6	.3
100.	.9	.5	.3	.1
110.	.7	.5	.3	.0
120.	.6	.4	.2	.0
130.	.6	.4	.3	.0
140.	.6	.3	.3	.0
150.	.7	.4	.4	.0
160.	.8	.3	.5	.0
170.	.9	.3	.4	.1
180.	.6	.6	.2	.3
190.	.4	.8	.0	.5
200.	.3	.7	.0	.5
210.	.4	.6	.0	.4
220.	.4	.6	.0	.4
230.	.4	.6	.0	.4
240.	.4	.7	.0	.4
250.	.5	.7	.0	.4
260.	.5	.8	.1	.4
270.	.3	.7	.3	.8
280.	.1	.3	.6	1.1
290.	.0	.2	.6	.8
300.	.0	.3	.5	.7
310.	.0	.3	.4	.7
320.	.0	.3	.4	.7
330.	.0	.3	.4	.6
340.	.0	.4	.4	.7
350.	.0	.5	.4	.8
360.	.2	.3	.7	.6
MAX	.9	.8	.9	1.1
DEGR.	100	190	10	280

THE HIGHEST CONCENTRATION OF 1.10 PPM OCCURRED AT RECEPTOR REC4 .

Dated 95221

JOB: AlamedaCesarChavezproject

RUN: CAL3QHC RUN

DATE : 12/13/ 7

TIME : 16:38:37

The MODE flag has been set to C for calculating CO averages.

SITE & METEOROLOGICAL VARIABLES

 VS = .0 CM/S VD = .0 CM/S Z0 = 100. CM
 U = 1.0 M/S CLAS = 6 (F) ATIM = 60. MINUTES MIXH =
 1000. M AMB = .0 PPM

LINK VARIABLES

LINK DESCRIPTION				*	LINK COORDINATES (FT)					*	
LENGTH	BRG	TYPE	VPH	EF	H	W	V/C	QUEUE			
(FT)	(DEG)		(G/MI)		X1		Y1		X2	Y2	
					(FT)	(FT)	(VEH)				

	1.	nba		*	524.0		.0		524.0	500.0	*
500.	360.	AG	1240.	4.4	.0	68.0					
	2.	nbd		*	524.0		500.0		524.0	1000.0	*
500.	360.	AG	1138.	4.4	.0	68.0					
	3.	sba		*	476.0		1000.0		476.0	500.0	*
500.	180.	AG	887.	4.4	.0	68.0					
	4.	sbd		*	476.0		500.0		476.0	.0	*
500.	180.	AG	1013.	4.4	.0	68.0					
	5.	eba		*	.0		476.0		500.0	476.0	*
500.	90.	AG	1441.	4.4	.0	68.0					
	6.	ebd		*	500.0		476.0		1000.0	476.0	*
500.	90.	AG	1330.	4.4	.0	68.0					
	7.	wba		*	1000.0		524.0		500.0	524.0	*
500.	270.	AG	1117.	4.4	.0	68.0					
	8.	wbd		*	500.0		524.0		.0	524.0	*
500.	270.	AG	1204.	4.4	.0	68.0					
	9.	nbq		*	524.0		452.0		524.0	399.5	*
53.	180.	AG	31.	100.0	.0	48.0	.49	2.7			
	10.	sbq		*	476.0		548.0		476.0	585.5	*
37.	360.	AG	31.	100.0	.0	48.0	.35	1.9			
	11.	ebq		*	452.0		476.0		400.8	476.0	*
51.	270.	AG	26.	100.0	.0	48.0	.47	2.6			
	12.	wbq		*	548.0		524.0		587.7	524.0	*
40.	90.	AG	26.	100.0	.0	48.0	.36	2.0			

ADDITIONAL QUEUE LINK PARAMETERS

LINK DESCRIPTION				*	CYCLE	RED	CLEARANCE	APPROACH	
SATURATION	IDLE	SIGNAL	ARRIVAL	*	LENGTH	TIME	LOST TIME	VOL	FLOW
RATE	EM FAC	TYPE	RATE						

(gm/hr)		*	(SEC)	(SEC)	(SEC)	(VPH)	(VPH)
-----*							
5.56	9. nbq		60	31	3.0	1240	1600
	3	3	*				
5.56	10. sbq		60	31	3.0	887	1600
	3	3	*				
5.56	11. ebq		60	26	3.0	1441	1600
	3	3	*				
5.56	12. wbq		60	26	3.0	1117	1600
	3	3	*				

RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (FT)			*
	*	X	Y	Z	*
-----*					
1. nw 10 ft	*	442.0	558.0	6.0	*
2. ne 10 ft	*	558.0	558.0	6.0	*
3. sw 10 ft	*	442.0	442.0	6.0	*
4. se 10 ft	*	558.0	442.0	6.0	*

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-360.

WIND ANGLE (DEGR)	* CONCENTRATION (PPM)	REC1	REC2	REC3	REC4
0.	*	.2	.3	.7	.6
10.	*	.4	.0	.9	.3
20.	*	.4	.0	.7	.3
30.	*	.3	.0	.6	.3
40.	*	.3	.0	.5	.3
50.	*	.3	.0	.7	.3
60.	*	.3	.0	.6	.4
70.	*	.3	.0	.8	.5
80.	*	.3	.0	.8	.6
90.	*	.6	.2	.7	.3
100.	*	.9	.5	.3	.1
110.	*	.7	.5	.3	.0
120.	*	.6	.4	.2	.0
130.	*	.6	.4	.3	.0
140.	*	.6	.4	.3	.0
150.	*	.7	.4	.4	.0
160.	*	.8	.3	.5	.0
170.	*	.9	.3	.4	.1
180.	*	.6	.7	.2	.3
190.	*	.4	.8	.0	.5
200.	*	.3	.7	.0	.5
210.	*	.4	.6	.0	.4
220.	*	.4	.6	.0	.4
230.	*	.4	.6	.0	.4
240.	*	.4	.7	.0	.4
250.	*	.5	.7	.0	.4
260.	*	.5	.8	.1	.4
270.	*	.3	.7	.3	.8
280.	*	.1	.3	.6	1.1
290.	*	.0	.2	.6	.8
300.	*	.0	.3	.5	.8
310.	*	.0	.3	.4	.7
320.	*	.0	.3	.4	.7
330.	*	.0	.3	.4	.6
340.	*	.0	.4	.4	.7
350.	*	.0	.5	.4	.8
360.	*	.2	.3	.7	.6
MAX	*	.9	.8	.9	1.1
DEGR.	*	100	190	10	280

THE HIGHEST CONCENTRATION OF 1.10 PPM OCCURRED AT RECEPTOR REC4 .

RECEPTOR	*	X	Y	Z	*
1. nw 10 ft	*	134.7	170.1	1.8	*
2. ne 10 ft	*	170.1	170.1	1.8	*
3. sw 10 ft	*	134.7	134.7	1.8	*
4. se 10 ft	*	170.1	134.7	1.8	*

JOB: VignesCesarChavezExisting

RUN: CAL3QHC RUN

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-360.

WIND ANGLE (DEGR)	* RECI	* CONC2	* CONC3	* CONC4
0.	.1	.2	.5	.6
10.	.3	.0	.8	.3
20.	.3	.0	.6	.3
30.	.2	.0	.6	.3
40.	.2	.0	.5	.4
50.	.2	.0	.6	.4
60.	.2	.0	.7	.5
70.	.3	.0	.9	.7
80.	.3	.0	.9	.7
90.	.6	.2	.7	.4
100.	.9	.5	.3	.1
110.	.8	.6	.2	.0
120.	.6	.4	.2	.0
130.	.5	.4	.2	.0
140.	.5	.4	.2	.0
150.	.5	.3	.2	.0
160.	.6	.3	.3	.0
170.	.5	.4	.3	.0
180.	.3	.6	.1	.2
190.	.2	.9	.0	.5
200.	.2	.7	.0	.4
210.	.3	.5	.0	.3
220.	.4	.5	.0	.4
230.	.4	.3	.0	.4
240.	.4	.5	.0	.3
250.	.5	.7	.0	.3
260.	.5	.8	.1	.2
270.	.2	.6	.3	.7
280.	.0	.2	.6	.9
290.	.0	.2	.6	.8
300.	.0	.2	.4	.5
310.	.0	.2	.4	.5
320.	.0	.2	.3	.5
330.	.0	.3	.4	.6
340.	.0	.3	.4	.6
350.	.0	.4	.4	.7
360.	.1	.2	.5	.6
MAX	.9	.9	.9	.9
DEGR.	100	190	70	280

THE HIGHEST CONCENTRATION OF .90 PPM OCCURRED AT RECEPTOR REC1 .

PAGE 1

JOB: VignesCesarChavezNoProject

RUN: CAL3QHC RUN

DATE : 12/13/ 7

TIME : 17: 0:17

The MODE flag has been set to C for calculating CO averages.

SITE & METEOROLOGICAL VARIABLES

VS = .0 CM/S VD = .0 CM/S Z0 = 100. CM
 U = 1.0 M/S CLAS = 6 (F) ATIM = 60. MINUTES MIXH = 1000. M AMB =
 .0 PPM

LINK VARIABLES

EF	LINK DESCRIPTION				LINK COORDINATES (M)				LENGTH (M)	BRG TYPE (DEG)	VPH
	H	W	V/C	QUEUE	X1	Y1	X2	Y2			
(G/MI)	(M)	(M)	(VEH)								
4.4	1.	nba			159.7	.0	159.7	152.4	152.	360. AG	907.
4.4	.0	20.7									
4.4	2.	nbd			159.7	152.4	159.7	304.8	152.	360. AG	703.
4.4	.0	20.7									
4.4	3.	sba			145.1	304.8	145.1	152.4	152.	180. AG	564.
4.4	.0	20.7									
4.4	4.	sbd			145.1	152.4	145.1	.0	152.	180. AG	464.
4.4	.0	20.7									
4.4	5.	eba			.0	145.1	152.4	145.1	152.	90. AG	1413.
4.4	.0	20.7									
4.4	6.	ebd			152.4	145.1	304.8	145.1	152.	90. AG	1664.
4.4	.0	20.7									
4.4	7.	wba			304.8	159.7	152.4	159.7	152.	270. AG	1033.
4.4	.0	20.7									
4.4	8.	wbd			152.4	159.7	.0	159.7	152.	270. AG	1086.
4.4	.0	20.7									
100.0	9.	nbq			159.7	137.8	159.7	124.2	14.	180. AG	36.
100.0	.0	14.6	.45	2.3							
100.0	10.	sbq			145.1	167.0	145.1	175.5	8.	360. AG	36.
100.0	.0	14.6	.28	1.4							
100.0	11.	ebq			137.8	145.1	125.4	145.1	12.	270. AG	21.
100.0	.0	14.6	.39	2.1							
100.0	12.	wbq			167.0	159.7	176.1	159.7	9.	90. AG	21.
100.0	.0	14.6	.28	1.5							

ADDITIONAL QUEUE LINK PARAMETERS

ARRIVAL RATE	LINK DESCRIPTION				CYCLE	RED	CLEARANCE	APPROACH	SATURATION	IDLE	SIGNAL
					LENGTH	TIME	LOST TIME	VOL	FLOW RATE	EM FAC	TYPE
					(SEC)	(SEC)	(SEC)	(VPH)	(VPH)	(gm/hr)	
3	9.	nbq			60	36	3.0	907	1600	5.56	3
3	10.	sbq			60	36	3.0	564	1600	5.56	3
3	11.	ebq			60	21	3.0	1413	1600	5.56	3
3	12.	wbq			60	21	3.0	1033	1600	5.56	3

RECEPTOR LOCATIONS

* COORDINATES (M) *

RECEPTOR	*	X	Y	Z	*
1. nw 10 ft	*	134.7	170.1	1.8	*
2. ne 10 ft	*	170.1	170.1	1.8	*
3. sw 10 ft	*	134.7	134.7	1.8	*
4. se 10 ft	*	170.1	134.7	1.8	*

JOB: VignesCesarChavezNoProject

RUN: CAL3QHC RUN

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-360.

WIND ANGLE (DEGR)	* RECI	* CONC2	* CONC3	* CONC4
0.	.1	.2	.5	.5
10.	.3	.0	.6	.3
20.	.2	.0	.5	.3
30.	.2	.0	.5	.3
40.	.2	.0	.5	.4
50.	.2	.0	.5	.4
60.	.3	.0	.6	.4
70.	.3	.0	.8	.6
80.	.3	.0	.8	.7
90.	.6	.2	.7	.4
100.	.9	.6	.3	.1
110.	.8	.6	.2	.0
120.	.6	.4	.2	.0
130.	.5	.4	.2	.0
140.	.5	.4	.2	.0
150.	.5	.3	.2	.0
160.	.5	.4	.2	.0
170.	.5	.4	.3	.0
180.	.3	.6	.1	.2
190.	.2	.7	.0	.3
200.	.2	.6	.0	.3
210.	.2	.5	.0	.3
220.	.3	.4	.0	.4
230.	.4	.4	.0	.2
240.	.4	.5	.0	.2
250.	.5	.7	.0	.2
260.	.5	.8	.1	.2
270.	.2	.6	.3	.6
280.	.0	.2	.6	.9
290.	.0	.2	.6	.7
300.	.0	.2	.4	.5
310.	.0	.2	.3	.5
320.	.0	.2	.3	.5
330.	.0	.2	.4	.6
340.	.0	.3	.4	.6
350.	.0	.3	.4	.7
360.	.1	.2	.5	.5
MAX	.9	.8	.8	.9
DEGR.	100	260	80	280

THE HIGHEST CONCENTRATION OF .90 PPM OCCURRED AT RECEPTOR REC1 .

PAGE 1

JOB: VignesCesarChavezProject

RUN: CAL3QHC RUN

DATE : 12/13/ 7

TIME : 17: 4:18

The MODE flag has been set to C for calculating CO averages.

SITE & METEOROLOGICAL VARIABLES

VS = .0 CM/S VD = .0 CM/S Z0 = 100. CM
 U = 1.0 M/S CLAS = 6 (F) ATIM = 60. MINUTES MIXH = 1000. M AMB =
 .0 PPM

LINK VARIABLES

EF	LINK DESCRIPTION				LINK COORDINATES (M)				LENGTH (M)	BRG TYPE (DEG)	VPH
	H	W	V/C	QUEUE	X1	Y1	X2	Y2			
	(G/MI)	(M)	(M)	(VEH)							
4.4	1. nba				159.7	.0	159.7	152.4	152.	360. AG	918.
4.4	.0 20.7										
4.4	2. nbd				159.7	152.4	159.7	304.8	152.	360. AG	734.
4.4	.0 20.7										
4.4	3. sba				145.1	304.8	145.1	152.4	152.	180. AG	569.
4.4	.0 20.7										
4.4	4. sbd				145.1	152.4	145.1	.0	152.	180. AG	478.
4.4	.0 20.7										
4.4	5. eba				.0	145.1	152.4	145.1	152.	90. AG	1439.
4.4	.0 20.7										
4.4	6. ebd				152.4	145.1	304.8	145.1	152.	90. AG	1682.
4.4	.0 20.7										
4.4	7. wba				304.8	159.7	152.4	159.7	152.	270. AG	1057.
4.4	.0 20.7										
4.4	8. wbd				152.4	159.7	.0	159.7	152.	270. AG	1089.
4.4	.0 20.7										
100.0	9. nbq				159.7	137.8	159.7	124.0	14.	180. AG	36.
100.0	.0 14.6 .45 2.3										
100.0	10. sbq				145.1	167.0	145.1	175.6	9.	360. AG	36.
100.0	.0 14.6 .28 1.4										
100.0	11. ebq				137.8	145.1	125.2	145.1	13.	270. AG	21.
100.0	.0 14.6 .40 2.1										
100.0	12. wbq				167.0	159.7	176.3	159.7	9.	90. AG	21.
100.0	.0 14.6 .29 1.5										

ADDITIONAL QUEUE LINK PARAMETERS

ARRIVAL RATE	LINK DESCRIPTION	CYCLE LENGTH (SEC)	RED TIME (SEC)	CLEARANCE LOST TIME (SEC)	APPROACH VOL (VPH)	SATURATION FLOW RATE (VPH)	IDLE EM FAC (gm/hr)	SIGNAL TYPE
3	10. sbq	60	36	3.0	569	1600	5.56	3
3	11. ebq	60	21	3.0	1439	1600	5.56	3
3	12. wbq	60	21	3.0	1057	1600	5.56	3

RECEPTOR LOCATIONS

* COORDINATES (M) *

RECEPTOR	*	X	Y	Z	*
1. nw 10 ft	*	134.7	170.1	1.8	*
2. ne 10 ft	*	170.1	170.1	1.8	*
3. sw 10 ft	*	134.7	134.7	1.8	*
4. se 10 ft	*	170.1	134.7	1.8	*

JOB: VignesCesarChavezProject

RUN: CAL3QHC RUN

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-360.

WIND ANGLE (DEGR)	* RECI	* CONC2	* CONC3	* CONC4
0.	.1	.2	.5	.5
10.	.3	.0	.6	.3
20.	.2	.0	.5	.3
30.	.2	.0	.5	.3
40.	.2	.0	.5	.4
50.	.2	.0	.5	.4
60.	.3	.0	.6	.4
70.	.3	.0	.8	.6
80.	.3	.0	.9	.7
90.	.6	.2	.7	.4
100.	.9	.6	.3	.1
110.	.8	.6	.3	.0
120.	.6	.4	.2	.0
130.	.5	.4	.2	.0
140.	.5	.4	.2	.0
150.	.5	.3	.2	.0
160.	.5	.4	.2	.0
170.	.5	.4	.3	.0
180.	.3	.6	.1	.2
190.	.2	.7	.0	.3
200.	.2	.6	.0	.3
210.	.3	.5	.0	.3
220.	.4	.4	.0	.4
230.	.4	.4	.0	.3
240.	.4	.5	.0	.2
250.	.5	.7	.0	.2
260.	.5	.8	.1	.2
270.	.2	.6	.3	.6
280.	.0	.2	.6	.9
290.	.0	.2	.6	.7
300.	.0	.2	.4	.5
310.	.0	.2	.3	.5
320.	.0	.2	.3	.5
330.	.0	.2	.4	.6
340.	.0	.3	.4	.6
350.	.0	.3	.4	.7
360.	.1	.2	.5	.5
MAX	.9	.8	.9	.9
DEGR.	100	260	80	280

THE HIGHEST CONCENTRATION OF .90 PPM OCCURRED AT RECEPTOR REC1 .

**MTA Union Division Bus Maintenance and Operations Facility
Regional Operational Emissions 2009**

Emission Factors (grams/mile)						
Vehicle	VOC	CO	NO_x	SO_x	PM_{2.5}	PM₁₀
Auto ¹	0.019	3.69	0.38	0.004	0.004	0.017
Bus ²	0.82	8.20	4.92	-	0.040	0.041

Regional Operational Emissions (pounds/day)					
VOC	CO	NO_x	SO_x	PM_{2.5}	PM₁₀
5	35	16	0.009	0.13	0.16

Existing Auto VMT³	New Auto VMT⁴	Bus VMT⁵
319	665	1,341

¹ Auto emission factors obtained from EMFAC2007.

² CNG emission factors obtained from CARB.

³ Based on trip distance of 1.4 miles(from existing facility) and 114 existing employees.

⁴ Based on trip distance of 1.4 miles(from existing facility) and 25 existing employees.

⁵ Based on bus trip distance of 1.4 miles(from existing facility) and 479 RT(buses).

Title : Employee Commute Regional Emissions
 Version : Emfac2007 V2.3 Nov 1 2006
 Run Date : 2008/01/07 12:03:28
 Scen Year: 2008 -- All model years in the range 1965 to 2008 selected
 Season : Winter
 Area : Los Angeles

 Year: 2008 -- Model Years 1965 to 2008 Inclusive -- Winter
 Emfac2007 Emission Factors: V2.3 Nov 1 2006

County Average Los Angeles County Average

Table 1: Running Exhaust Emissions (grams/mile)

Pollutant Name: Total Organic Gases Temperature: 63F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
25	0.172	0.209	0.000	0.000	0.000	0.000	0.186

Pollutant Name: Carbon Monoxide Temperature: 63F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
25	3.371	4.208	0.000	0.000	0.000	0.000	3.689

Pollutant Name: Oxides of Nitrogen Temperature: 63F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
25	0.306	0.500	0.000	0.000	0.000	0.000	0.380

Pollutant Name: Carbon Dioxide Temperature: 63F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
25	392.369	483.122	0.000	0.000	0.000	0.000	426.850

Pollutant Name: Sulfur Dioxide Temperature: 63F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
25	0.004	0.005	0.000	0.000	0.000	0.000	0.004

Pollutant Name: PM10 Temperature: 63F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
25	0.013	0.024	0.000	0.000	0.000	0.000	0.017

Pollutant Name: PM10 - Tire Wear Temperature: 63F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
25	0.008	0.008	0.000	0.000	0.000	0.000	0.008

Pollutant Name: PM10 - Break Wear Temperature: 63F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
25	0.013	0.013	0.000	0.000	0.000	0.000	0.013

Pollutant Name: Gasoline - mi/gal Temperature: 63F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
25	22.300	18.052	0.000	0.000	0.000	0.000	20.691

Pollutant Name: Diesel - mi/gal Temperature: 63F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
25	27.659	28.909	0.000	0.000	0.000	0.000	28.489

CNG Bus Emissions		
Pollutant	Certified Emissions (g/bhp-hr) ¹	Calculated Emissions (g/mi) ²
VOC	0.2	0.82
NO _x	1.2	4.92
CO	2.0	8.2
PM	0.01	0.041
CO ₂ equiv ³	-	3,275

1. Certified emissions are from the CARB's Heavy-Duty On-Road Certification Listings. The engine was assumed to be either a 2005 Cummins CG-280 or a LG-320, whichever generated higher
2. Calculated using a CARB conversion factor of 4.3 bhp-hr/mi for CNG.
3. Greenhouse gas (GHG) emissions over the entire fuel cycle (fuel production, transmission, and end-use), expressed as carbon-equivalents based on the relative radiative forcing (global warming potential) of key GHGs. Assumes 18.3 MMTC-eq/Quad of CNG (Delucchi 1995) and a fuel economy of 2.7 mpg (diesel equivalent) for a CNG bus (CARB 1996). End-use emissions, including both carbon dioxide and methane, are from CARB (1996).

APPENDIX C

Cultural Resources Survey

**REVISED FINAL
Cultural Resources Survey
for the Los Angeles County
Metropolitan Transportation
Authority Union Division Project,
Los Angeles County, California**

Prepared for

Terry A. Hayes Associates

Prepared by

SWCA Environmental Consultants

October 25, 2007

REVISED FINAL

**CULTURAL RESOURCES SURVEY FOR
METROPOLITAN TRANSPORTATION AUTHORITY
UNION DIVISION PROJECT
LOS ANGELES COUNTY, CALIFORNIA**

Prepared for

Terry A. Hayes Associates
8522 National Boulevard, Suite 102
Culver City, California 90232

Prepared by

Kevin Hunt
Emily Game
and
Cindy Arrington, MS, RPA

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USGS 7.5-Minute Quadrangle
Los Angeles, California

SWCA Project No. 12191-191

SWCA Cultural Resources Report Database No. 2007-443

October 25, 2007

MANAGEMENT SUMMARY/ABSTRACT

Purpose and Scope: Terry A. Hayes Associates (TAHA) retained SWCA Environmental Consultants (SWCA) to conduct a cultural resources study of an 8.23-acre area as a part of the Section 106 of the National Historic Preservation Act (NHPA) review process for a proposed bus maintenance facility and parking structure known as the Metropolitan Transportation Authority (Metro) Union Division Project. The project area is located in an industrial area of east downtown Los Angeles, Los Angeles County, California. SWCA's services entailed a records and literature search, initial Native American Consultation, an intensive pedestrian survey of the project area for cultural resources, recommendation of an area of potential effect (APE) for historic properties, and evaluation of potential effects to historic properties. This report documents the results of the study.

Dates of Investigation: The cultural resources records search for the project was conducted November 14, 2006, the Native American consultation was initiated on November 14, 2006, and the cultural resources field survey was conducted November 16, 2006. The draft report was completed in December 2006, a final version, incorporating TAHA and Metro comments, was completed in September 2007, and this revised final version incorporating new information about streetlamps was completed on October 25, 2007.

Findings of the Investigation: The records and literature search indicated that six previously recorded cultural resources are located within 0.25 miles of the project area; none of these resources are located within the project area. Prior to this study, twenty-nine cultural resource studies had been previously conducted within 0.25 miles of the project, one of which included the project area. The Native American Heritage Commission's search of the Sacred Lands File response indicated that their search failed to indicate the presence of Native American sacred lands within the immediate project area. However, the Commission did indicate the presence of sensitive Native American cultural resources within the vicinity of the project. The ethnographic village of Yangna was reportedly located within the general project vicinity; however, the village was abandoned prior to 1836 (Robinson 1952 as noted in Goldberg et al. 1999) and the village has not been definitely relocated to date. Anthony Morales of the Gabrielin-Tongva San Gabriel Band of Mission Indians stated that the project area is highly sensitive for Native American cultural resources and that archaeological and Native American monitoring of construction grading activities is very strongly recommended. No cultural resources were observed within the project area during the survey. A review of the *Draft Phase I Environmental Site Assessment Report* (Andersen Environmental 2006) completed for the project has indicated that the project area has been intensively developed since at least the 1880s and that a cemetery was present adjacent to the west of the project area in the late 1880s. Past use of various portions the project area (per Andersen Environmental 2006) includes dwellings and stables, a winery (the California Star Winery), a scrap metal and recycling facility (Eureka Iron and Metal Co.), a Southern California Gas Co. facility, and a gas station in the southern portion.

No historic properties were identified within the formal area of potential effect (APE) for the project; however, two resources (Los Angeles Union Station and the Macy Street Viaduct) were identified immediately adjacent to the APE and therefore effects to these resources were considered. No adverse effects to these resources were identified during this study. A series of ornamental lampposts that appeared historic in age and identified within the APE were determined to be modern lamps designed to look like nearby historic period lamps; effects to these modern lamps would not be adverse under Section 106 of the NHPA.

Investigation Constraints: The project area is located within an urban setting and presently consists of existing buildings, a parking lot, and a landscaped median in Vignes Street. As such, the cultural

resources survey was constrained by poor ground visibility, with approximately 98 percent of the ground covered by asphalt or modern buildings. The remaining two percent of exposed ground was heavily disturbed by landscaping and utilities. Former uses of the project area have included underground storage tanks, which were removed and backfilled in the northern portion but potentially remain in the southern portion. These tanks occupied a small portion of the project area, but are indicative of the historic and modern period subsurface disturbance of the project area.

Recommendations: Due to the likelihood that buried archaeological resources could be present within the project area, SWCA recommends that a qualified archaeologist monitor all ground-disturbing construction activities within the project area. In the event that prehistoric or other possibly Native American artifacts are encountered, SWCA recommends retaining a Native American monitor to observe the treatment of the find and remaining ground-disturbing construction activities in the vicinity.

Disposition of Data: This report will be filed with the South Central Coastal Information Center, located at California State University, Fullerton, with TAHA, and with SWCA. All field notes and records related to the current project are on file at the Pasadena Office of SWCA.

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APPENDICES

Appendix A: Records Search Results
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INTRODUCTION

Contract Data: Terry A. Hayes Associates (TAHA) retained SWCA Environmental Consultants (SWCA) to conduct a cultural resources survey of 8.23 acres of land owned by the Metropolitan Transportation Authority (Metro) Union Division. A paleontological resources study has also been prepared by SWCA for the project under separate cover (DeBusk and Corsetti 2006).

Undertaking: The Metro Union Division Project proposes to construct a three-story parking structure and two-story bus maintenance/office building through a combination of new and reused/adapted development. In addition, a proposed vehicle and pedestrian bridge would connect a spiral ramp on the southern portion of the project area over Cesar E. Chavez Avenue to the parking structure.

The Metro Union Division Project is funded by Metro with assistance from the Federal Transit Administration (FTA). The lead federal agency for this undertaking is FTA. As a federal undertaking, the project is subject to Section 106 of the National Historic Preservation Act (NHPA) (36CFR800). The NHPA authorizes the maintenance of a National Register of Historic Places (NRHP) that facilitates the preservation of properties possessing integrity and meeting at least one of the four criteria delineated by Section 106 (Advisory Council on Historic Preservation 2000). Section 106 requires federal agencies to consider the effects of their undertakings on historic properties (cultural resources listed on or eligible for inclusion on the NRHP).

The quality of *significance* in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess *integrity* of location, design, setting, materials, workmanship, feeling and association, and:

- (A) That are associated with events that have made a significant contribution to the broad patterns of our history; or
- (B) That are associated with the lives of persons significant in our past; or
- (C) That embody the distinctive characteristics of a type, period, or method of installation, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- (D) That have yielded, or may be likely to yield, information important in prehistory or history.

In addition to federal mandates, Metro, as a California state agency, is required to comply with the California Environmental Quality Act (CEQA) (Governor's Office of Planning and Research 1998). Public Resources Code SS5024.1 and CEQA Sections 15064.5, 21083.2 and 21084.1 present further guidelines for the cultural resources study (Governor's Office of Planning and Research 1998). Public Resources Code SS5024.1 requires evaluation of historical resources to determine their eligibility for listing on the California Register of Historical Resources (CRHR). The purposes of the CRHR are to maintain listings of the state's historical resources and to indicate which properties are to be protected from substantial adverse change (Office of Archaeology and Historic Preservation 1997).

The format of this report follows Archaeological Resource Management Reports: Recommended Contents and Format (Office of Historic Preservation 1990).

Undertaking: The proposed project entails construction and redevelopment of an existing Metro parking lot and bus maintenance facility to a three story parking structure, including a maintenance facility.

Project Limits: The project area is located in east of downtown Los Angeles, in Los Angeles County, California. Project boundaries are depicted on the U.S. Geological Survey (USGS) 7.5-Minute

Quadrangle *Los Angeles, California* (1966, Photorevised 1981; see Figure 1). The project is located at the intersection of Cesar E. Chavez Avenue and Vignes Street, within unsectioned City of Los Angeles lands.

Personnel: SWCA archaeologist Kevin Hunt managed this project, conducted the Native American consultation, and coauthored this report. SWCA archaeologist Emily Game conducted the field survey and coauthored this report. Cindy Arrington, MS, RPA, served as the principal investigator for this project, SWCA GIS Specialist Burt McAlpine created the maps, and Russ Gatlin served as the technical editor.

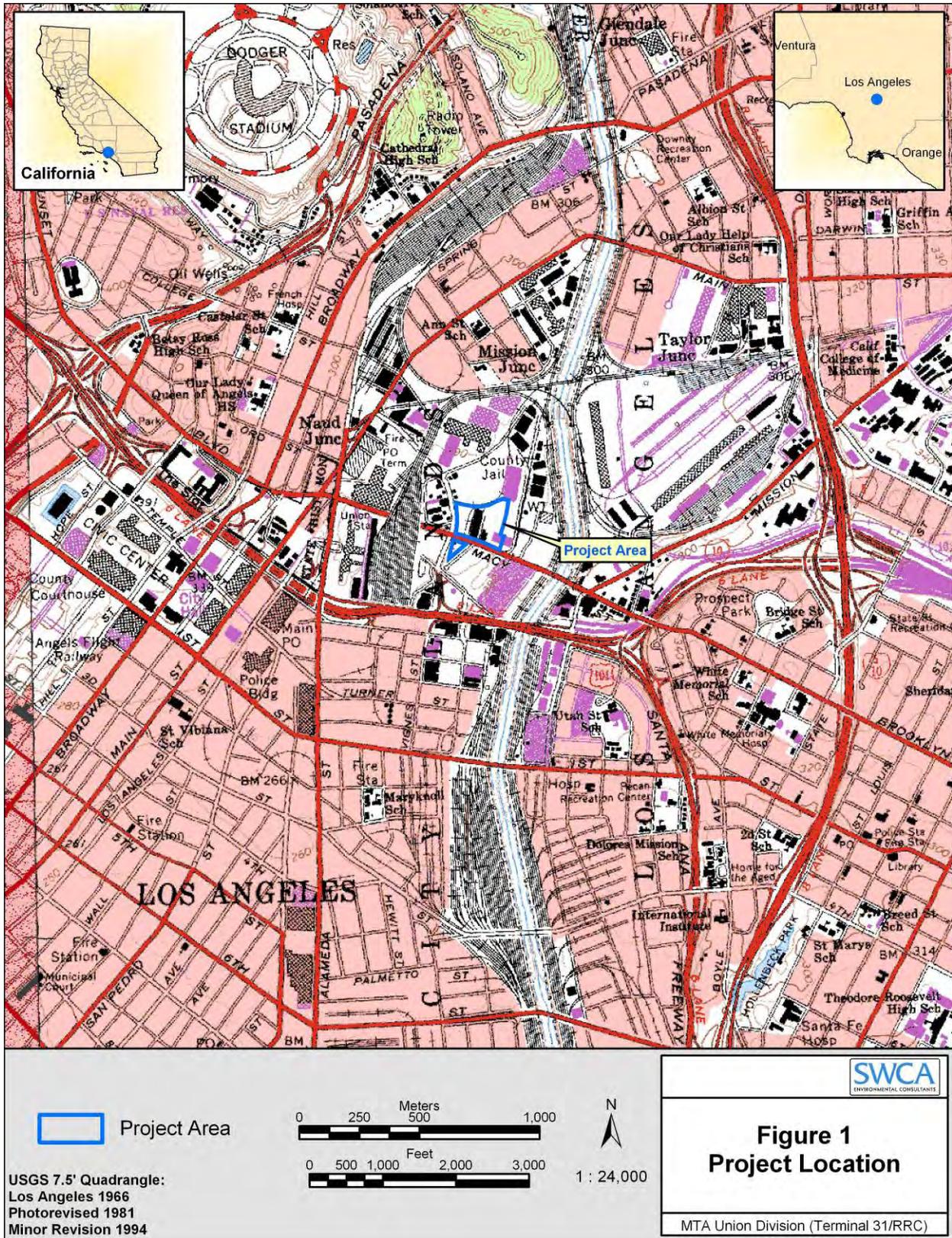


Figure 1. Project Location Map

NATURAL SETTING

The Metro Union Division project area is located within the City of Los Angeles in Los Angeles County, California. The majority of the discontinuous project area is located at the northeast corner of the intersection of Cesar E. Chavez Avenue and Vignes Street, and occupies 7.58 acres (see Figure 1 and Photograph 1). The smaller 0.65-acre triangular-shaped portion of the project is located south of Cesar E. Chavez Avenue and is bounded by Vignes Street on the west and Lyon Street on the east (see Figure 1 and Photograph 2). The northern, larger portion of the project area presently consists of the Metro bus and employee parking lot, as well as the bus maintenance area. The portion of the project area south of Cesar E. Chavez Avenue possesses the only exposed soils in the project area; however, the vast majority of this area is covered by a large concrete structure.

Geologically, the project area is underlain by Quaternary alluvium, either as fan deposits derived from the Santa Monica Mountains to the west, or as floodplain fluvial deposits of the Los Angeles River, which is located approximately 0.15 mile to the east (DeBusk and Corsetti 2006). Late Miocene marine deposits, referred to as the Puente Formation, underlie the Quaternary alluvium. The project area is relatively flat with an approximate elevation of 330 feet above mean sea level.

Vegetation within the project area, as well as the surrounding vicinity, has been removed and replaced with ornamental trees and shrubs. This lack of vegetation is due to the ongoing commercialization and industrialization of the downtown Los Angeles area (Photograph 1 and Photograph 2).

The project area has generally hot dry summers, with maximum temperatures ranging from 18.8 to 29.4 degrees Celsius (66° to 85° Fahrenheit) and winter lows ranging from 7.2 to 18.3 degrees Celsius (45° to 65° Fahrenheit) (Munz and Keck 1968:17). The average annual precipitation is 38.1 centimeters (15 inches).



Photograph 1. Overview of northern portion of project area, facing north



Photograph 2. Overview of southern portion of project area, facing south

CULTURAL SETTING

PREHISTORIC OVERVIEW

Numerous chronological sequences have been devised to understand cultural changes for various areas within southern California over the past century. Building on early studies and focusing on data synthesis, Wallace (1955, 1978) developed a prehistoric chronology for the southern California coastal region, which is still widely used today and is applicable to near coastal and many inland areas, including Los Angeles County. Four periods are presented in Wallace's prehistoric sequence: Early Man, Milling Stone, Intermediate, and Late Prehistoric. As noted by Moratto (1984:159), Wallace's (1955) synthesis lacked chronological precision due to the lack of absolute dates at the time of its creation, but remains generally valid today.

In addition to Wallace's classic summary, a regional synthesis developed by Warren (1968) will be referred to in the following discussion. This synthesis is supported by a larger archaeological database for southern California, which includes the advent and increased use of radiocarbon dating after the 1950s. Using the concepts of cultural ecology and cultural tradition, Warren (1968) proposed a series of six prehistoric traditions. Three of these traditions, the San Dieguito Tradition, Encinitas Tradition, and Campbell Tradition, correlate with Wallace's Early Man, Milling Stone, and Intermediate. The Chumash Tradition, Takic Tradition (formerly "Shoshonean"), and Yuman Tradition are represented within Wallace's Late Prehistoric Period. As noted further, these ecologically based traditions are applicable to specific regions within southern California.

Some revisions have been made to Wallace's 1955 synthesis using radiocarbon dates and projectile point assemblages (e.g., Koerper and Drover 1983; Mason and Peterson 1994; Koerper et al. 2002). The summary of prehistoric chronological sequences for southern California coastal and near-coastal areas presented below is a composite of information in Wallace (1955) and Warren (1968), as well as more recent studies, including Koerper and Drover (1983). The chronology formulated by Koerper and Drover (1983) is based on the results of their excavations at a multi-component village site (CA-ORA-119-A) near the University of California, Irvine, in Orange County. Diagnostic artifacts, particularly projectile points, and other cultural material produced evidence at CA-ORA-119-A from the late Milling Stone, Intermediate, Late Prehistoric, and early Historic Periods.

Early Man Period /San Dieguito/Paleo-Coastal (ca. 10,000–6000 B.C.)

When Wallace defined the Early Man Period in the mid-1950s, there was little evidence of human presence on the southern California coast prior to 6000 B.C. Archaeological work in the intervening years has identified numerous older sites dating prior to 10,000 years ago, including ones on the coast and Channel Islands (e.g., Erlandson 1991; Rick et al. 2001:609; Johnson et al. 2002; Moratto 1984). The earliest accepted dates for occupation are from two of the northern Channel Islands, located off the coast from Santa Barbara. On San Miguel Island, Daisy Cave clearly establishes the presence of people in this area about 10,000 years ago (Erlandson 1991:105). On Santa Rosa Island, human remains have been dated from the Arlington Springs site to approximately 13,000 years ago (Johnson et al. 2002).

Recent data from coastal, as well as inland, sites during this period indicate that the economy was a diverse mixture of hunting and gathering, with a major emphasis on aquatic resources in many coastal areas (e.g., Jones et al. 2002) and on Pleistocene lakeshores in eastern San Diego County (see Moratto 1984:90-92). A Paleo-Coastal Tradition was proposed and recently referenced to highlight the distinctive marine and littoral focus identified within the southern California coastal archaeological record prior to the emergence of the Encinitas Tradition during the succeeding Milling Stone Period (Moratto 1984:104;

Mason and Peterson 1994:57-58). At coastal sites, there is abundant evidence that marine resources such as fish, sea mammals, and shellfish were exploited during the Paleo-Coastal.

At near-coastal and inland sites, it is generally considered that an emphasis on hunting may have been greater during the Early Man Period than in later periods, although few Clovis-like or Folsom-like fluted points have been found in southern California (e.g., Erlandson et al. 1987; Dillon 2002). In Riverside County, only one isolated fluted point has been identified on the surface of a site in the Pinto Basin in the central part of the county (Campbell and Campbell 1935; Dillon 2002:113). Common elements in many San Dieguito Tradition sites include leaf-shaped bifacial projectile points and knives, stemmed or shouldered projectile points (e.g., Silver Lake and Lake Mojave series), scrapers, engraving tools, and crescents (Warren 1967:174-177; Warren and True 1961:251-254). Use of the atlatl (spear-throwing stick) during this period facilitated launching spears with greater power and distance. Subsistence patterns shifted around 6000 B.C. coincident with the gradual desiccation associated with the onset of the Altithermal, a warm and dry period that lasted for about 3000 years. After 6000 B.C., a greater emphasis was placed on plant foods and small animals.

Milling Stone Period (ca. 6000–3000/1000 B.C.)

The Milling Stone Period of Wallace (1955, 1978) and Encinitas Tradition of Warren (1968) are characterized by an ecological adaptation to collecting, and by the dominance of the principal ground stone implements generally associated with the horizontal motion of grinding small seeds; namely, milling stones (metates, slabs) and handstones (manos, mullers), which are typically shaped. Milling stones occur in large numbers for the first time, and are even more numerous near the end of this period. As testified by their toolkits and shell middens in coastal sites, people during this period practiced a mixed food procurement strategy. Subsistence patterns varied somewhat as groups became better adapted to their regional or local environments.

Milling Stone Period sites are common in the southern California coastal region between Santa Barbara and San Diego, and at many inland locations including the Prado Basin in western Riverside County and the Pauma Valley in northeastern San Diego County (e.g., True 1958; Herring 1968; Langenwalter and Brock 1985; Sutton 1993; Sawyer and Brock 1999). Wallace (1955, 1978) and Warren (1968) relied on several key coastal sites to characterize the Milling Stone Period and Encinitas Tradition, respectively. These include the Oak Grove Complex in the Santa Barbara region, Little Sycamore in southwestern Ventura County, Topanga Canyon in the Santa Monica Mountains, and at La Jolla in San Diego County. The Encinitas Tradition was proposed to extend southward into San Diego County where it apparently continued alongside the following Campbell Tradition, which occurred primarily in the Santa Barbara-Ventura County region beginning around 3000 B.C.

Of the numerous Milling Stone Period sites identified in the region, the most well known is the Irvine site (CA-ORA-64), which has occupation levels dating between circa 6000–4000 B.C. (Drover et al. 1983; Macko 1998). Along coastal Orange County, Koerper and Drover (1983:11) mark the transition at the end of the Milling Stone around 1000 B.C., while Wallace's mid-1950s scheme has the period ending at 3000 B.C. Based on radiocarbon dates from the Newport Coast Archaeological Project (NCAP) project, Mason and Peterson (1994) propose a timeline for the Milling Stone similar to that advanced by Koerper and Drover. The chronological schemes advanced for coastal Orange County also apply to many southern California near-coastal and inland areas, including much of Los Angeles County.

During the Milling Stone Period and Encinitas Tradition, stone chopping, scraping, and cutting tools are abundant, and generally made from locally available raw material. Projectile points, rather large and generally leaf-shaped, and bone tools, including awls, are generally rare. The large points are associated

with the spear, and probably with an atlatl. Items made from shell, including beads, pendants, and abalone dishes, are generally rare. Evidence of weaving or basketry is present at a few sites. Cogged stones and discoidals are often purposefully buried or “cached,” and are found mainly in sites along the coastal drainages from southern Ventura County southward, with a few specimens inland at Cajon Pass, and in abundance at some Orange County sites (Dixon 1968:63; Moratto 1984:149). Kowta (1969) attributes the presence of numerous scraper-planes in Milling Stone sites to the preparation of agave or yucca for food or fiber. The mortar and pestle, associated with the vertical motion of pounding foods, such as acorns, were introduced during the Milling Stone, but are not common.

Two types of artifacts that are considered diagnostic of the Milling Stone Period are the cogged stone and discoidal, most of which have been found within sites dating between 4000–1000 B.C. (Moratto 1984:149). The cogged stone is best described as a ground stone object that has variant forms of gear-like teeth on the perimeter, which is produced from a variety of materials. The function of cogged stones is unknown, but has been interpreted as ritualistic or ceremonial in nature (Eberhart 1961:367; Dixon 1968:64-65). Similar to cogged stones, discoidals are found in the archaeological record subsequent to the introduction of the cogged stone. Both discoidals and cogged stones have been found together at some Orange County sites, such as CA-ORA-83/86/144 (Van Bueren et al. 1989:772), CA-ORA-950 (Ron Bissell, personal communication 1999), and Los Cerritos Ranch (Dixon 1975 in Moratto 1984:150).

Koerper and Drover (1983) suggest that Milling Stone Period sites represent migratory settlement patterns of hunters and gatherers who used marine resources during the winter and inland resources the remainder of the year. More recent research indicates that residential bases or camps were moved to resources in a seasonal round (de Barros 1996; Mason et al. 1997; Koerper et al. 2002), or that some sites were occupied year-round with portions of the village population leaving at certain times of the year to exploit available resources (Cottrell and Del Chario 1981). Regardless of settlement system, it is clear that subsistence strategies during the Milling Stone Period included hunting of small and large terrestrial mammals, sea mammals, and birds; collecting shellfish and other shore species; extensive use of seed and plant products; the processing of yucca and agave; and nearshore fishing with barbs or gorges (Reinman 1964; Kowta 1969). As evidenced by the abundant milling equipment found at these sites throughout the region, the processing of small seeds was an important component of their subsistence practices.

Characteristic mortuary practices during the Milling Stone Period or Encinitas Tradition include extended and loosely flexed burials, some with red ochre and few grave goods, such as shell beads and milling stones, interred beneath cobble or milling stone cairns. “Killed” milling stones, exhibiting holes, may occur in the cairns. Reburials are common in the Los Angeles County area, with flexed burials oriented to the north common southward in Orange and San Diego Counties. Evidence of wattle-and-daub structures and walls have been identified at some sites in the San Joaquin Hills and Newport Coast area spanning all cultural periods (Mason et al. 1991, 1992, 1993; Koerper 1995; Strudwick 2004; Sawyer 2006).

Perhaps one unique trait of the Milling Stone Period, isolated to a small region of coastal Orange County, is the presence of a rudimentary ceramic industry involving the creation of fired clay effigies, figurines, and small crude thick-walled pottery vessels (Drover 1971, 1975; Drover et al. 1983; Macko 1998; Sawyer and Koerper 2006). The figurines have been found at the Irvine site (CA-ORA-64) on Newport Bay at a collapsed rockshelter site (CA-ORA-1405-B) within Muddy Canyon.

Intermediate Period (ca. 3000/1000 B.C.–A.D. 500/650)

Following the Milling Stone, Wallace’s Intermediate Period and Warren’s Campbell Tradition in Santa Barbara, Ventura, and parts of Los Angeles Counties, date from approximately 3000 B.C.–A.D. 500 and are characterized by a shift toward a hunting and maritime subsistence strategy, along with a wider use of

plant foods. The Campbell Tradition (Warren 1968) incorporates David B. Rogers' (1929) Hunting Culture and related expressions along the Santa Barbara coast. In the San Diego region, the Encinitas Tradition (Warren 1968) and the La Jolla Culture (Moriarty 1966; M. Rogers 1939, 1945) persist with little change during this time.

Temporal placement of the Intermediate is generally recognized as ranging between 3000 B.C. and A.D. 500 (Wallace 1955; Warren 1968). In Orange County, researchers have estimated the Intermediate Period began around 1000 B.C. and lasted until circa A.D. 650 (3000–1300 B.P.) (Koerper and Drover 1983:11; Mason and Peterson 1994). A more recent evaluation, based on some 1300 calibrated radiocarbon dates from sites in Orange County, suggests a date of 1400 B.C. for the start of the Intermediate, marked by single-piece circular fishhooks and coinciding with the transition from the Middle to Late Holocene (Koerper et al. 2002:67–68). Another researcher sees the Intermediate, not as a cultural period, but as a transition between the Milling Stone and the later Late Prehistoric Period, based on his investigations at sites in the Bonita Mesa area near upper Newport Bay (Peterson 2000). This idea may simply reflect a sub-regional or area specific trends at sites in and around Newport Bay rather than an accurate depiction of the cultural period dynamics in Orange County and the greater southern California region.

During the Intermediate Period, there is a pronounced trend toward greater adaptation to regional or local resources. For example, the remains of fish, land mammals, and sea mammals are increasingly abundant and diverse in sites along the California coast in the referenced region. Related chipped stone tools suitable for hunting are more abundant and diversified, and shell fishhooks become part of the toolkit during this period. Larger knives, a variety of flake scrapers, and drill-like implements are common during this period. Projectile points include large side-notched, stemmed, and lanceolate or leaf-shaped forms. Koerper and Drover (1983) consider Gypsum Cave and Elko series points, which have a wide distribution in the Great Basin and Mojave deserts between circa 2000 B.C.–A.D. 500, to be diagnostic of this period. Bone tools, including awls, are more numerous than in the preceding period, and the use of asphaltum adhesive is now common.

Mortars and pestles become more common during this period, gradually replacing manos and metates as milling stone implements. In addition, hopper mortars and stone bowls, including steatite vessels, appear to enter the toolkit at this time. This shift appears to be a correlate of a diversification in subsistence resources. Many archaeologists believe this change in milling stones signals a shift away from the processing and consuming of hard seed resources to the increasing importance of the acorn (e.g., Glassow et al. 1988; True 1993). It has been argued that mortars and pestles may have been used initially to process roots (e.g., tubers, bulbs, and corms associated with marshland plants), with acorn processing beginning at a later point in prehistory (Glassow 1997:86) and continuing to European contact.

Characteristic mortuary practices during the Intermediate Period include fully flexed burials, placed face down or face up, and oriented toward the north or west (Warren 1968:2–3). Red ochre is common, and abalone shell dishes infrequent. Interments sometimes occurred beneath cairns or broken artifacts. Shell, bone and stone ornaments, including charmstones, are more common than in the preceding Encinitas Tradition. Some later sites include Olivella shell and steatite beads, mortars with flat bases and flaring sides, and a few small points. The broad distribution of steatite from the Channel Islands and obsidian from distant inland regions, among other items, attest to the growth of trade, particularly during the later part of this period.

Late Prehistoric Period (ca. A.D. 500/650–A.D. 1769)

Wallace (1955, 1978) places the beginning of the Late Prehistoric around A.D. 500. In Orange County, the start of this period is recognized at a slightly later date, circa A.D. 650 (Koerper and Drover 1983;

Mason and Peterson 1994). In all chronological schemes for southern California, the Late Prehistoric Period lasts until European contact occurred in A.D. 1769.

During the Late Prehistoric Period, there was an increase in the use of plant food resources in addition to an increase in land and sea mammal hunting. There was a concomitant increase in the diversity and complexity of material culture during this period, demonstrated by more classes of artifacts. The recovery of a greater number of small, finely chipped projectile points, usually stemless with convex or concave bases, suggests an increased utilization of the bow and arrow rather than the atlatl and dart for hunting. In Orange County, Cottonwood series triangular projectile points in particular are diagnostic of this period (Koerper and Drover 1983). Other items include steatite cooking vessels and containers, the increased presence of smaller bone and shell circular fishhooks, perforated stones, arrow shaft straighteners made of steatite, a variety of bone tools, and personal ornaments made from shell, bone, and stone. There is also an increased use of asphalt for waterproofing and as an adhesive.

During the Late Prehistoric, sites contain beautiful and complex objects of utility, art, and decoration. Ornaments include drilled whole Chione (venus clam) and drilled abalone. Steatite effigies become more common, with Pecten shell rattles common in middens. In Orange County, for example, Pecten shell rattles are concentrated in the Late Prehistoric midden at CA-ORA-119A, and other time sensitive artifacts, including abalone ornaments and drilled Chione shells, present (Koerper and Drover 1983:19-20). Most of the rock art found today in the Chumash sphere is thought to date to this period. Mortuary customs are elaborate, including cremation and interment, with abundant grave goods.

By A.D. 1000, fired clay smoking pipes and ceramic vessels begin to appear at some sites (Meighan 1954; Warren 1984). The scarcity of pottery in coastal and near-coastal sites implies ceramic technology was not well developed in that area, or that ceramics were obtained by trade with neighboring groups to the south and east. The lack of widespread pottery manufacture is usually attributed to the high quality of tightly woven and watertight basketry that functioned in the same capacity as ceramic vessels.

Another feature typical of Late Prehistoric Period occupation is an increase in the frequency of obsidian imported from the Obsidian Butte source in Imperial County, California. Obsidian Butte was exploited after circa A.D. 1000 after its exposure by the receding waters of Holocene Lake Cahuilla (Wilke 1978). A Late Prehistoric Period component of the Elsinore site (CA-RIV-2798-A) produced two flakes that originated from Obsidian Butte (Grenda 1997:255; Towner et al. 1997:224-225). Although about 16 percent of the debitage at the Peppertree site (CA-RIV-463) at Perris Reservoir is obsidian, no sourcing study was done (Wilke 1974:61). The site contains a late Intermediate to Late Prehistoric period component and it is assumed that most of the obsidian originated from Obsidian Butte. In the earlier Milling Stone and Intermediate Periods, most of the obsidian found at sites within Orange County and many inland areas came from northern sources, mostly the Coso volcanic field. This also appears to be the case within Prado Basin and other interior sites that have yielded obsidian (e.g., Grenda 1995:59; Taşkıran 1997:46). The presence of Grimes Canyon (Ventura County) fused shale at southern California archaeological sites is also thought to be typical of the Late Prehistoric Period (Demcak 1981; Hall 1988).

During this period, there is an increase in population size accompanied by the advent of larger, more permanent villages (Wallace 1955:223). Large populations and, in places, high population densities are characteristic, with some coastal and near-coastal settlements containing as many as 1,500 people. Many of the larger settlements were permanent villages, where people resided year-round. The populations of these villages may have also increased seasonally.

In Warren's (1968) cultural ecological scheme, the period between A.D. 500 and European contact is divided into three regional patterns. The Chumash Tradition is present mainly in the region of Santa Barbara and Ventura Counties; the Takic or Numic Tradition in the Los Angeles, Orange, and western

Riverside Counties region; and the Yuman Tradition in the San Diego region. The seemingly abrupt changes in material culture, burial practices, and subsistence focus at the beginning of the Late Prehistoric Period are considered the result of a migration to the coast of peoples from inland desert regions to the east. In addition to the small triangular and triangular side-notched points similar to those found in the desert regions in the Great Basin and Lower Colorado River, Colorado River pottery and the introduction of cremation in the archaeological record are diagnostic of the Yuman Tradition in the San Diego region. This combination certainly suggests a strong influence from the Colorado Desert region.

In Los Angeles, Orange, and western Riverside Counties, similar changes (introduction of cremation, pottery, and small triangular arrow points) are considered the result of a Takic migration to the coast from inland desert regions. This Takic or Numic Tradition was formerly referred to as the “Shoshonean wedge” or “Shoshonean intrusion” (Warren 1968). This terminology, used originally to describe a Uto-Aztecan language group, is generally no longer employed in order to avoid confusion with ethnohistoric and modern Shoshonean groups who spoke Numic languages (Heizer 1978:5; Shipley 1978:88, 90). Modern Gabrielino/Tongva, Juaneño, and Luiseño in this region are considered the descendants of the prehistoric Uto-Aztecan, Takic-speaking populations that settled along the California coast during this period, or perhaps somewhat earlier.

ETHNOGRAPHIC OVERVIEW

The Metro Union Division project area lies within the central lands of the Gabrielino, or Tongva, Native American group (Bean and Smith 1978:538–549). The name “Gabrielino” denotes those people who were administered by the Spanish from Mission San Gabriel, which included people from the Gabrielino proper, as well as other social groups (Bean and Smith 1978; Kroeber 1925). Therefore, in the post-contact period the name does not necessarily identify a specific ethnic or tribal group. The names Native Americans in southern California used to identify themselves have, for the most part, been lost. Many contemporary Gabrielino identify themselves as descendents of the indigenous people living across the plains of the Los Angeles Basin and refer to themselves as the *Tongva*.

The Gabrielino language, as well as that of the Juaneño and Luiseño to the south, was derived from the Takic family, part of the Uto-Aztecan linguistic stock, which can be traced to the Great Basin area (Mithun 1999:539). This language group represents an origin quite different from that of the Chumash to the north and the Ipai and Tipai further south. The language of the Ipai and Tipai is derived from the Hokan stock of the Yuman language family originating in the American Southwest. The Chumash language is unlike both the Hokan and Uto-Aztecan stocks, and may represent a separate lineage (Mithun 1999:390). Linguistic analysis suggests that Takic-speaking immigrants from the Great Basin area began moving into southern California around 500 B.C. (Kroeber 1925:579). This migration may have displaced both Chumashan and Yuman speaking peoples. The timing and extent of the migrations and their impact on indigenous peoples is not well understood and any data related to it represents a valuable contribution to the understanding of local prehistory.

Gabrielino lands encompassed the greater Los Angeles Basin and three Channel Islands, San Clemente, San Nicolas, and Santa Catalina. Inland, their territory was bounded on the north by the Chumash at Topanga Creek, the Serrano at the San Gabriel Mountains in the east, and the Juaneño on the south at Aliso Creek (Bean and Smith 1978:538; Kroeber 1925:636). This southern boundary of Gabrielino territory at Aliso Creek was based on anthropological fieldwork conducted by Kroeber in 1907 (Kroeber 1925), however the Juaneño currently dispute the defined northern boundary of their lands with the Gabrielino at Aliso Creek.

The Tongva established large, permanent villages in the fertile lowlands along rivers and streams, and in sheltered areas along the coast, stretching from the foothills of the San Gabriel Mountains to the Pacific Ocean. A total tribal population has been estimated of at least 5,000 (Bean and Smith 1978:540), but recent ethnohistoric work suggests a number approaching 10,000 seems more likely (O'Neil 2002).

Houses constructed by the Tongva were large, circular, domed structures made of willow poles thatched with tule that could hold up to 50 people (Bean and Smith 1978). Other structures served as sweathouses, menstrual huts, ceremonial enclosures, and probably communal granaries. Cleared fields for races and games, such as lacrosse and pole throwing, were created adjacent to Tongva villages (McCawley 1996:27). Archaeological sites comprised of villages with various sized structures have been identified.

The fundamental economy of the Tongva was one of subsistence gathering and hunting. The surrounding environment was rich and varied, and the tribe exploited mountains, foothills, valleys, deserts, riparian, estuarine, and open and rocky coastal eco-niches. With a large portion of their territory situated inland, they had access to juniper, yucca, and other vegetation from higher and drier areas than exclusively coastal peoples. As with most Native Californians, however, acorns were the staple food, supplemented by the roots, leaves, seeds, and fruit of a wide variety of flora. Fresh and saltwater fish, shellfish, birds, insects, as well as large and small mammals, were also exploited.

While members of the local Gabrielino tribe utilized hundreds of plants, the most important species representing food resources in local hills and valleys included acorn-bearing oaks such as coast live oak (*Quercus agrifolia*), canyon live oak (*Quercus chrysolepis*), scrub oak, and Engelmann oak (*Quercus engelmannii*); pine trees with piñon nuts (*Pinus quadrifolia* and other *Pinus* spp.); prickly-pear cacti with fruit and fleshy leaves (*Opuntia littoralis* and *Opuntia basilaris*); chia (*Salvia columbariae*); and yucca with blossoms and flower stalks (*Yucca whipplei* and *Yucca schidigera*, and *Agave deserti*). To a lesser degree several hard-seed plants were gathered, such as manzanita (*Arctostaphylos glauca* and *Arctostaphylos pringlei*), sunflowers (*Helianthus annuus*), chia and other sages (*Salvia* spp.), lemonade berry (*Rhus trilobata*), wild rose (*Rosa californica*), California buckwheat (*Eriogonum fasciculatum*), and coyote gourd or calabazilla (*Cucurbita foetidissima*), along with berries, tubers, and greens (O'Neil 2001; Bean and Smith 1978:538–539). Among the most important tubers are the blue dicks (*Dichelostemma capitatum*) and harvest brodiaea (*Brodiaea jolonensis*) for food and amole (*Chlorogalum pomeridianum*) for tools and soap. Common greens included several *Chenopodium* spp., clovers (*Trifolium* spp.), miner's lettuce (*Claytonia perfoliata*), wild-rhubarb (*Rumex hymenosepalus*), and white sage (*Salvia apiana*), all to be found in the immediate region. Several native California berry-producing plants exist, such as toyon, the desert wild grape (*Vitis girdiana*), and California blackberry (*Rubus ursinus*), while the blue elderberry was gathered for medicines and tools as well as food. Numerous other plants were used as medicines; as twine; in the production of basket weaving, ornamentation, and tools; and in religious ceremonies (O'Neil 2001).

Animals available for exploitation by the local indigenous population would have included mule deer (*Odocoileus hemionus*), desert cottontail (*Sylvilagus audubonii*), black-tailed jackrabbit (*Lepus californicus*), pocket mice (*Perognathus* spp.), wood rats (*Dipodomys* spp.), California quail (*Callipepla californica*), mourning dove (*Zenaidura macroura*), and birds associated with the marshes; and various types of reptiles, amphibians, and insects. While antelope (*Antilocapra americana*) were barely noted by Anglo settlers (Sleeper 1982), they were quite common in 1769 throughout the plains and valleys when the Portolá Expedition came through the region, whereas mule deer appear to have been less common (Brown 2001:308, 325). Predators included mountain lion (*Felis concolor*), coyote (*Canis latrans*), bobcat (*Lynx rufus*), and gray fox (*Urocyon cinereoargenteus*).

A wide variety of tools and implements were employed by the Gabrielino to gather and collect food resources. These included the bow and arrow, traps, nets, blinds, throwing sticks and slings, spears,

harpoons, and hooks. Groups residing near the ocean used ocean-going plank canoes and tule balsa canoes for fishing, travel, and trade between the mainland and the Channel Islands (McCawley 1996:7).

Foods were processed with a variety of tools, including hammerstones and anvils, mortars and pestles, manos and metates, strainers, leaching baskets and bowls, knives, bone saws, and wooden drying racks. Food was consumed from a variety of vessels. Catalina Island steatite was used to make ollas and cooking vessels (Kroeber 1925:629).

At the time of Spanish contact, the basis of Tongva religious life was the Chinigchinich Cult, centered on the last of a series of heroic mythological figures. Chinigchinich gave instruction on laws and institutions, and also taught the people how to dance, the primary religious act for this society. He later withdrew into heaven where he rewarded the faithful and punished those who disobeyed his laws (Kroeber 1925:637-638). The Chinigchinich religion seems to have been relatively new when the Spanish arrived, and was in the process of spreading south into the Southern Takic groups even as Christian missionization was taking place, and may have been influenced by Christianity.

Deceased Tongva were either buried or cremated (Harrington 1942; McCawley 1996). During the contact period, cremation was the standard practice for the mainland Tongva. Cremation ashes have been found in archaeological contexts buried within stone bowls and in shell dishes (Ashby and Winterbourne 1966:27). Archaeological and ethnographic data describe a wide variety of grave offerings, including seeds, stone grinding tools, otter skins, baskets, wood tools, shell beads, bone and shell ornaments, and projectile points and knives. Offerings varied with the sex and status of the deceased. Graves were sometimes marked, and in the San Pedro area headstones or boards were etched with figures.

Previous overviews and studies (e.g., Chartkoff and Chartkoff 1984; Dillon 1994; Goldberg et al. 1999; Robinson 1952) have indicated that the Gabrielino ethnographic village of Yaanga (alternative spellings include Yang-na and Yangna) was located in the vicinity of the current project. As summarized in Goldberg et al.'s (1999:40) *The People of Yaanga?: Archaeological Investigations at CA-LAN-1575/H, The Metropolitan Water District of Southern California Headquarters Facility Project*, the village was noted on the west side of the Los Angeles River by Portola in 1769 but was deserted prior to 1836 and its precise location is uncertain. Though later researchers have speculated regarding the exact location, no definitive conclusion has been reached. Goldberg et al. provide evidence that the prehistoric/ethnographic period cemetery identified at CA-LAN-1575/H may have been associated with a village such as Yangna, but do not claim to have verified its location.

HISTORIC OVERVIEW

The first Europeans to explore what would become the State of California belonged to the 1542 expedition of Juan Rodriguez Cabrillo, who sailed along and occasionally landed on the coast. Europeans are thought to have first visited portions of the interior in 1769, when Gaspar de Portolá led a 62-person overland expedition from San Diego to Monterey (Cramer 1988). Two later expeditions, led by Juan Bautista de Anza in 1774 and 1775 from Sonora through southwestern Arizona and southern California, crossed the Santa Ana River at Anza Narrows in today's Santa Ana River Regional Park.

The Spanish government subsequently established missions and military outposts to facilitate colonization of the area and to keep rival European nations out of the area. After Mexico won independence from Spain in 1822, colonization efforts in Alta California decreased. The Spanish mission system was largely abandoned and the Mexican government bestowed land grants or ranchos to those loyal to the Mexican government as well as some Anglo settlers. The Mexican Period (1822–1848) is largely identified with the Ranchos acquired by individuals through the land grant system as well as the

secularization of the missions. Mission secularization began on July 25, 1826 with a decree by Governor Jose Maria Echeandía and was completed by 1836 after an additional decree in 1831 (Engstrand and Ward 1995).

The end of the Mexican Period in California began on June 14, 1846 when a band of American settlers supported by an American explorer named John C. Frémont and his team captured Mexican General Mariano Guadalupe Vallejo in a dawn raid in Sonoma (Ide 1880; Rolle 2003). The Americans raised a flag for the “California Republic” and their actions became known as the “Bear Flag Revolt.” The so-called California Republic was short-lived however, as on July 7, 1846, U.S. Navy forces captured Monterey, California, where the U.S. flag was raised (Rolle 2003). On February 2, 1848, the war between the U.S. and Mexico ended with the signing of the Treaty of Guadalupe Hidalgo, which greatly expanded U.S. territory (including California) and resulted in Mexico being paid \$15 million for the land (Rolle 2003).

Although gold had been found prior to this in various parts of California, the well-publicized discovery of gold near Sutter’s Fort in 1848 dramatically increased the Anglo settlement of California. Despite property rights of Rancho owners being secured by provisions in the Treaty of Guadalupe Hidalgo, California in the early American Period experienced the transfer and subdivision of many of the Ranchos as well as a shift from ranching to agriculture as the primary means of subsistence.

Los Angeles County

The first European account of the area to become the County of Los Angeles was by Portuguese navigator João Rodrigues Cabrilho (Juan Rodriguez Cabrillo in Spanish), who led a Spanish expedition along the California coast in 1542-1543 (Chartkoff and Chartkoff 1984: 252-3). Cabrillo noted the numerous campfires of the Gabrielino and thus named the area the “Bay of Smokes.” Spain’s presence in the region was only intermittent for approximately 200 years until, fearing the very real possibility of territorial encroachment by the British and Russians from the north, Spanish Governor of Baja California Gaspar de Portolá was instructed to lead a combined land-sea expedition to colonize Alta California in the 1760s (Chartkoff and Chartkoff 1984: 254-7).

On September 8, 1771, Fathers Pedro Cambón and Angel Somera established the Mission San Gabriel de Arcángel near the present-day city of Montebello (Johnson et al. 1972). In 1775, the mission was moved to its current location in San Gabriel due to better agricultural lands. The establishment of this mission marked the first sustained European occupation of the Los Angeles County area. Mission San Gabriel, despite a slow start partially due to misconduct by Spanish soldiers, eventually became so prosperous it was known as “The Queen of the Missions (Johnson et al. 1972).” As described below in the City of Los Angeles section, the pueblo that eventually became the city was established in 1781. During this period, Spain also deeded ranchos to prominent citizens and soldiers (though very few in comparison to the Mexican Period). Rancho San Pedro, one such rancho, was deeded to soldier Juan Jose Dominguez in 1784 and comprised 75,000 acres encompassing the modern South Bay region from the Los Angeles River on the east to the Pacific Ocean on the west (Dominguez Rancho Adobe Museum 2006).

The area that became Los Angeles County saw an increase in European settlement during the Mexican Period largely due to the many land grants (ranchos) by various governors to Mexican citizens. However, the Mexican Period for Los Angeles ended in early January 1847. Mexican forces fought combined U.S. Army and U.S. Navy forces in the Battle of the San Gabriel River on January 8 and in the Battle of La Mesa on January 9 (Nevin 1978). On January 10, leaders of the Pueblo of Los Angeles surrendered peacefully after Mexican General Jose Maria Flores withdrew his forces. Shortly thereafter, newly

appointed Mexican Military Commander of California Andrés Pico surrendered all of Alta California to U.S. Army Lieutenant Colonel John C. Fremont in the Treaty of Cahuenga (Nevin 1978).

Settlement of the Los Angeles region continued in the early American Period. The County of Los Angeles was established on February 18, 1850, one of 27 counties established in the months prior to California acquiring official statehood in the U.S. (County of Los Angeles 2006.). Many of the ranchos in the county were sold or otherwise acquired by Americans and most were subdivided into agricultural parcels or towns. Nonetheless, ranching retained its importance and by the late 1860s, Los Angeles was one of the top dairy production centers in the country (Rolle 2003). By 1876, Los Angeles County reportedly had a population of 30,000 persons (Dumke 1944:7).

In 1854, the U.S. Congress agreed to let San Pedro to become an official port of entry for the U.S. and by the 1880s the railroads had established networks throughout the county resulting in the fast and affordable shipment of goods as well as a means to transport new residents to the booming region (Dumke 1944). New residents included many health-seekers drawn to the area in the 1870s-1880s by the fabled climate (Baur 1959).

The availability of freshwater has always been a concern for the residents of Los Angeles County. Many authors (e.g., Kahrl 1982, Mulholland 2000, Nadeau 1997, Reisner 1986) have identified the control and management of water as the single most important factor in the development of southern California. As William Mulholland did for the City of Los Angeles in 1913, the formation of the Metropolitan Water District of Southern California (MWD) in the 1920s secured water rights for many areas including portions of Los Angeles County not incorporated within the City of Los Angeles (MWD 2006, Nadeau 1997). The formation of MWD began in 1924, when then Mayor of Pasadena Hiram W. Wadsworth initiated the formation of the Colorado River Aqueduct Association (MWD 2006). Wadsworth, as president of this group representing 13 cities, pushed for the construction of an aqueduct similar to the Los Angeles-Owens Valley Aqueduct that would provide water from the Colorado River to thirsty southern California. This resulted in the incorporation of MWD in 1928 and the construction of the aqueduct, an engineering marvel that finally began delivering Colorado River water to MWD's member cities in 1941 and ultimately facilitated the incredible population growth that occurred in the region (MWD 2006).

Los Angeles County experienced population growth in the twentieth century that led to it being one of the most densely occupied areas of the U.S. In the early to mid 1900s, industry associated with both world wars as well as emigration from the Midwest "dust bowl" states during the Great Depression accelerated this growth. As humorously noted by David Gebhard and Harriette von Breton (Caughey and Caughey 1977: 291),

The Depression did make a temporary dip in growth, but there was too much going on for it really to stop the boom and then, of course, the Los Angeles Chamber of Commerce did not permit such disloyalty.

The county's mild climate and successful economy continued to draw new residents in the late 1900s, with much of the County transformed from ranches and farms into residential subdivisions surrounding commercial and industrial centers. Hollywood's development into the entertainment capitol of the world and southern California's booming aerospace industry were key factors in the County's growth in the twentieth century.

City of Los Angeles

Spanish Governor of California Felipe de Neve recognized the need to establish a pueblo north of the Mission San Gabriel to help supply Spain's military Presidios in California as well as to help maintain Spain's control over the region (Ríos-Bustamante 1992). On 4 September 1781, 22 settlers from Mexico accompanied by the governor, soldiers, mission priests, and several Native Americans arrived at the site alongside the Los Angeles River that was officially declared *El Pueblo de la Reina de Los Angeles* or "The Town of the Queen of the Angels (Ríos-Bustamante 1992)."¹

Spanish Period residents of the Pueblo of Los Angeles, troubled by the inconsistent nature of the Los Angeles River including periods of drought and flooding, established a water management system named the *Zanja Madre* (Mother Ditch). This ditch system for the delivery of water was maintained and improved in both the Mexican and Early American Periods and remained in use until the early 1900s. The residents used this water for ranching and agriculture to feed themselves, as well as to help provision the Presidios.

The Pueblo of Los Angeles grew in population during the Mexican Period (1822-1847) but retained the emphasis on ranching. Mexican Governors granted numerous ranchos during this period, and the few granted during the Spanish Period continued to operate or were broken up into smaller ranchos. On May 23, 1835, Los Angeles was officially declared a city by Mexican national decree (Bancroft 1885). During the Mexican Period, Anglo-Europeans such as Hugo Reid and Don Juan Forster were assimilated into Los Angeles's citizenry and culture (Dakin 1939).

On April 4, 1850, only two years after the Mexican American War and five months prior to California receiving statehood, the City of Los Angeles was formally incorporated. Los Angeles maintained its role as a regional business center in early American Period and the transition of many former rancho lands to agriculture, as well as the development of citriculture in the late 1800s, further strengthened this status (Caughey and Caughey 1977). These factors combined with the expansion of port facilities and railroads throughout the region contributed to the impact of the real estate boom of the 1880s on the City of Los Angeles (Caughey and Caughey 1977; Dumke 1944). The boom's fiscal impact can be observed through the City's tax assessments: In 1886 Los Angeles was assessed \$18,000,000 and in 1889 the total was \$46,000,000 (Dumke 1944). Despite the real estate boom largely occurring in surrounding areas, Los Angeles, as the commercial center, reaped substantial benefits from the explosive growth.

The City of Los Angeles recognized the need for water to sustain the growing population in the late 1800s and Irish immigrant William Mulholland personified the city's efforts for a stable water supply (Dumke 1944, Nadeau 1997, etc.). The City purchased large tracts of land in the Owens Valley and Mulholland planned and directed the construction of the 240-mile aqueduct that brought the valley's water to the city by 1913 (Nadeau 1997).

Los Angeles continued to grow in the twentieth century in part due to the discovery of oil in the area and its strategic location as a wartime port. The military presence led to the aviation and eventually aerospace industries having a large presence in the city and region. Mines Field, which would become Los Angeles International Airport (LAX), was established in 1928. The complexion of the multicultural city continued to change; however, the process was frequently painful for the new, and often unwelcome, ethnic groups (Garcia et al. 2004). Hollywood became the entertainment capital of the world through the presence of the film and television industries and continues to tenuously maintain that position. With nearly four million

¹ Ríos-Bustamante (1992) notes that scholars have identified official documents of Governor Felipe de Neve, Commandant General de la Croix, and Viceroy Bucareli that use this name, contrary to the popular belief that the original name was *El Pueblo de Nuestra Señora La Reina de Los Angeles de Porcinuncula*.

residents, Los Angeles is the second largest city in the U.S. (by population) and remains a city with worldwide influence while continuing to struggle with its population's growth and needs.

Transportation in Los Angeles

Transportation history in Los Angeles County extends back nearly 130 years, and includes over 220 companies ranging from horse cars, cable cars, steam trains, incline railways, electric streetcars and finally gas or diesel powered buses (Metro 2006). The first rail system was authorized by City Council on July 3, 1873 to David B. Waldron. With this authorization, Waldron started the Main Street Railroad, consisting of two iron rails and horses or mules to pull passengers (Metro 2006). This endeavor by Waldron lasted less than a year before the company was disenfranchised. The following year, Judge Robert M. Widney (also a founder of University of Southern California) began the Spring and 6th Street Franchise. This horse car line ran from Main Street, to Spring Street, to First, to Fort, to Fourth Street, to Hill Street and then to what is now known as Figueroa Street. This line serving the downtown Los Angeles area began the transportation industry in Los Angeles, with many more lines to be franchised in the following century. The Main Street and Agricultural Railroad, chartered in November of 1874, was the first suburban line in Los Angeles. In 1894, this line merged with the Los Angeles Railway and would continue to operate for the next fifty years under the Los Angeles Railway title (Metro 2006).

In the 1880s, the real estate boom in Southern California fueled the need for additional, and faster transportation routes (Dumke 1944). Beginning in 1889 many rail lines were converted to cable railway, and by 1896 lines were further upgraded to electric cars. In 1901, an incline railway was built called "Angels Flight". The "Shortest Railway in the World" (Los Angeles Landmarks 2006) moved passengers up the steep incline between Hill Street and Third Street; the ride lasted one minute and cost passengers one cent. Angels Flight was in operation for 60 continuous years, until it was closed and dismantled in 1969. Thirty years after the railway had been dismantled, it was restored and resurrected a half block from its original location. On 13 October 2003, Angels Flight was added to the National Register of Historic Places.

A major change came to the transportation industry as the Pacific Electric Subway opened its first line on November 30, 1925. The line, which was located under Fourth Street and Hill Street, ran to Beverly Boulevard and Glendale Boulevard allowing a larger number of passengers to be transported quickly and efficiently (Metro 2006). Less than five years after the subway had been introduced to the Los Angeles area, the dependency on the rail and bus system reduced drastically as the automobile became more affordable for the average person. The rise of the automobile continued to be a hindrance to the transportation industry and thirty years later, in 1955, the bus replaced the last Pacific Electric Subway line in Los Angeles (Metro 2006).

The Los Angeles Metropolitan Transportation Authority was established in 1951 by California Legislature and aimed to develop a monorail system along the Los Angeles River. Later in 1958, the Los Angeles Metropolitan Transportation Authority purchased the Metropolitan Coach Lines and the Los Angeles Transit Lines for 33.3 million dollars (Wikipedia 2006a). With this purchase, public transportation went from being a privately owned business to a publicly owned business. Los Angeles Metropolitan Transportation Authority was in operation until 1964, with the last street cars going out of operation in March of 1963 (Metro 2006).

The Southern California Rapid Transit District was established by state legislation on August 22, 1964 in an effort to develop and improve a public transportation system for southern California, including the City of Los Angeles (Metro 2006). The development of the South California Rapid Transit District received federal funding to develop the Metro Rail subway and rapid transit system. In addition to receiving

federal funding, the Southern California Rapid Transit District also purchased a number of local bus companies in order to expand their service area.

The Los Angeles County Transportation Commission (LACTC) was founded in 1976 in order to better manage public transportation and highways and created the Metro Blue, Red and Green lines. This Commission was in operation until 1993 when it combined with the present day Los Angeles Metropolitan Transportation Authority (Los Angeles County Transportation Commission Archives 2006). The Los Angeles County Metropolitan Authority (LACMetro or Metro) is responsible for the development and management of transportation solutions, environmental and planning issues in Los Angeles County (Wikipedia 2006a). To date the Metro employs approximately 9,200 people, and is the third largest public transportation systems in the United States (Wikipedia 2006a).

Project Site

The *Draft Phase I Environmental Site Assessment Report* prepared for the project by Andersen Environmental (2006) provides a detailed history of the occupation of the project area since the late 1880s. The study included a review of Sanborn Insurance maps dating to as early as 1888 that indicated the project area has been intensively developed since at least that time. The 1888 map noted that a cemetery was located adjacent to the west of the project area, which was not noted on the 1905 and later maps. Past uses of various portions within the project area (per Andersen Environmental 2006) include dwellings and stables, a winery (the California Star Winery), a scrap metal and recycling facility (Eureka Iron and Metal Co.), a Southern California Gas Co. facility, and a gas station. The predominantly residential nature of the project area in the 1880s had become mostly commercial in the 1920s, and industrial by the 1950s.

PRE-FIELD RESEARCH

LITERATURE SEARCH

This section identifies known cultural resources in the vicinity of the project area. Cultural resources include prehistoric and historic archaeological sites, districts, and objects; standing historic structures, buildings, districts, and objects; and locations of important historic events, or sites of traditional cultural properties. Prehistoric resources include sites, features, and artifacts associated with indigenous Californians, generally prior to contact with people of European descent. Historic resources include structures, features, artifacts, and sites that date from Euro-American settlement of the region. The South Central Coastal Information Center (SCCIC) was utilized for a literature and archival records search pertaining to previously recorded cultural resources and investigations within the project area and a 0.25 mile radius on November 29, 2006.

The SCCIC search included examination of background historic resources, including:

- Office of Historic Preservation Historic Property Directory
- California Historic Landmarks (1996)
- National Register of Historic Places (1996 and 2000)
- California Points of Historical Interest (1992 and updates)
- California Register of Historical Resources
- GLO (Government Land Office) Plat maps

- City of Los Angeles Historic-Cultural Monuments (HCM) Report. SWCA also independently inspected the electronic version of the HCM Report online on November 16, 2006.

The SCCIC considered the potential for identifying prehistoric or ethnohistoric resources within the current project location to be high; the potential for historic resources is considered moderate to high. Twenty-nine surveys have been conducted in the general region of the project area.

The CHRIS records search revealed six previously recorded cultural resources within 0.25 mile of the project area (see Table 1 and Appendix A). None of these resources are recorded within the project area. Of the six previously recorded resources, three are standing historic built environment resources (Union Station, the Macy Street Viaduct, and the Union Pacific Railroad); two are remnants of past built environment resources (P-19-003169 and P-19-003181); and one (CA-LAN-1575/H) is a multi-component archaeological site.

The Los Angeles Union Station building (P-19-171159; HCM #s 101 and 2346) was constructed in 1938. The station is listed in the National Register of Historic Places (NRHP) as an individual property (Status Code 1S), as well as on the California Register of Historical Resources (CRHR), and in the City of Los Angeles Historic Cultural Monument (HCM) Report for local and national significance. Los Angeles Union Station was designed by John and Donald B. Parkinson, and officially opened in May of 1939. The station is located at 800 North Alameda Street, approximately 0.25-0.5 mile west of the closest part of the project area. The station, known as the “last of the Great Railway Stations,” combines elements of Spanish Colonial, Mission Revival, and Streamline Moderne Style (Wikipedia 2006c). Moorish and Aztec influences can also be seen throughout the building.

The Macy Street Viaduct, also known as the Macy Street Bridge or Cesar Chavez Avenue Viaduct, was designed under the direction of Merrill Butler and was completed in 1926. The bridge is decorated in Spanish Revival ornamentation, specifically Spanish Baroque, and is constructed from reinforced concrete. Highly decorative elements of the bridge include porticos and light posts. The bridge is located east of the project area on Cesar E. Chavez Avenue and was seismically retrofitted in 1995. The Macy Street Viaduct has been formally recorded in Historic American Engineering Record (HAER) CA 277.

Site CA-LAN-1575/H was identified and excavated in the vicinity of Union Station during multiple construction grading projects. The site has produced domestic and commercial artifacts and architecture associated with Chinatown, dating between 1860 and 1930. A prehistoric component was also identified within the site that included a Native American cemetery with fourteen primary burials, five secondary deposition cremation burials, and two scatters of fragmentary human bone. Projectile points, groundstone tools, a stone pipe fragment, and bone awls and hairpins were also recovered.

Table 1. Previously Recorded Cultural Resources within 0.25 Mile of the Project Area

N/A	CA-LAN-1575/H	Historic domestic and commercial buildings and associated artifacts. Native American cemetery, and associated artifacts	Foster, J. / 1989, Horne, M. / 2000, Warren, K. / 2004
N/A	Macy Street Viaduct; Macy Street Bridge; Cesar Chavez Ave Viaduct; HCM #224; HAER # CA 277	Bridge over the Los Angeles River constructed in 1926 with Spanish Revival ornamentation	Currie, J. / 2000
P-19-003169	N/A	Railroad or trolley car track alignment	Robinson, M., Harris, N. / 2003
P-19-003181	J.M. Griffith Co. Planing Mill and Lumber Yard	Remnants of concrete foundation from mill and lumber yard	Hale, A. 2004
P-19-171159	Los Angeles Union Station; HCM # 101; HCM # 2346	Combination of Spanish Colonial, Mission Revival, and Streamline Moderne Style	
P-19-186110	Union Pacific Railroad Line; HRI# 30-176630	Standard gauge railroad, features include railroad stations, sidings, spurs and railyards	Ashkar, S. / 1999

According to CHRIS records, 29 cultural resource studies have been previously conducted within 0.25 miles of the project, one of which (LA2695) included the entire current project area, and another (LA6840) that included a portion of the current project area (see Table 2).² Both of the previous studies that included the current project area had negative results; no cultural resources were identified during the surveys.

SCCIC provided SWCA copies of two historic period maps that included the project area; the USGS 1896 and 1900 *Pasadena, California* 15-minute quadrangles. Both maps indicate the presence of buildings, roads, and railroads within the project vicinity at their respective dates, as well as at least one building within the project area on the map dated 1900.

The non-confidential portion of the CHRIS records search results is presented in Appendix A.

² Site records indicate that additional cultural resources studies have been conducted within the project vicinity that were not revealed in the CHRIS records search. None of these appear to have included the current project area.

Table 2. Previously Conducted Cultural Resources Studies within 0.25 Mile of the Project Area

LA0483	Archaeological Resources Survey of the Proposed Downtown People Mover Project Corridor Area	Greenwood, Roberta (1978)	No
LA1476	Archaeological Surface Surveys of Three Proposed Railway Connections Downtown Los Angeles, Los Nietos / Santa Fe Springs, and Colton, California	Singer, Clay A. (1985)	No
LA1577	Identification Study for Cultural Resources Within Proposed Metro Rail Subway Station Locations in Metropolitan Los Angeles, California	Westec Services, Inc. (1985)	No
LA1642	Los Angeles Downtown People Mover Program Archaeological Resources Survey: Phase II Evaluation of Significance and Recommendations for Future Actions	Costello, Julia G. (1980)	No
LA1643	Los Angeles Downtown People Mover Program Archaeological Resources Survey Phase 3	Costello, Julia G. (1981)	No
LA2577	Results of a Records Search Phase Conducted for the Proposed Alameda Corridor Project, Los Angeles County, California	Wlodarski, Robert J. (1992)	No
LA2618	Historical and Archaeological Assessment of the Southern California Rapid Transit District (SCRTD) Union Station Headquarters	Greenwood, Roberta S., John M. Foster, and Judith A. Rasson (1992)	No
LA2644	The Results of a Phase I Archaeological Study for the Proposed Alameda Transportation Corridor Project, Los Angeles County, California	Wlodarski, Robert J. (1992)	No
LA2695	Report of an Archaeological and Historical Survey Conducted for the 28+/- Acre Parcel Proposed for a New Central	Marie G. Cottrell (1979)	Yes
LA2712	Archaeological Survey Report for the El Monte Busway Extension in the City of Los Angeles, Los Angeles County, California	Huey, Geme (1978)	No
LA2727	Archaeological Literature and Records Review and Impact Analysis for the Eastside Corridor Alternatives Los Angeles, California	Brown, Joan C. (1992)	No
LA2731	Aliso Street Historical Report El Monte Busway Extension in the City of Los Angeles	Weitze, Karen J. (1980)	No
LA2788	Archaeological Literature and Records Review and Impact Analysis for the Eastside Corridor Alternatives Los Angeles, California	Brown, Joan C. (1992)	No
LA3103	Cultural Resources Impact Mitigation Program Angeles Metro Red Line Segment 1	Greenwood, Roberta (1993)	No
LA3151	Alameda District Plan, Los Angeles California: Prehistoric and Early Historic Archaeological Research	Dillon, Brian D. (1994)	No
LA3813	An Archival Study of a Segment of the Proposed Pacific Pipeline, City of Los Angeles, California	Peak & Associates, Inc. (1992)	No
LA4048	Archaeological Surface Surveys of Three Proposed Railway Connection in the Downtown Los Angeles, Los Nietos / Santa Fe Springs, and Colton, California	Singer, Clay A. (1985)	No

Table 2. Previously Conducted Cultural Resources Studies within 0.25 Mile of the Project Area

Report #	Title	Author	Include Current Project Area?
LA4082	Archaeological Survey Report for the I-15 Transitway	Romani, John (1982)	No
LA4219	Seismic Retrofit of Macy Street Bridge over the Los Angeles River	Lee, Portia (no date)	No
LA4448	Section 106 Documentation for the Metro rail Red Line Extension in the City and County of Los Angeles, California	Myra L. Frank & Associates (1994)	No
LA4625	Historic Property Survey for the Proposed Alameda Corridor from the Ports of Long Beach and Los Angeles to Downtown Los Angeles, in Los Angeles County, California	Starzak, Richard (1994)	No
LA4834	Cultural Resources Inventory Report for Williams Communications, Inc. Proposed Fiber Optic Cable System Installation Project, Los Angeles to Anaheim, Los Angeles and Orange Counties	Ashkar, Shahira (1999)	No
LA5131	Negative Archaeological Survey Report: 119910	Iverson, Gary (1999)	No
LA5201	Archaeological Assessment of Potential Hazardous Materials Storage Building at the Central Maintenance Facility, Los Angeles	Foster, John M. (2001)	No
LA6344	Archaeological Assessment of Potential Hazardous Materials Storage Building at the Central Maintenance Facility, Los Angeles	Foster, John M. (2001)	No
LA6399	A Cultural Resources Evaluation of the South Seas House, The Joseph Dupuy Residence Located at 2301 West 24 th Street, Los Angeles, Los Angeles County, California	McKenna, Jeanette (2001)	No
LA6840	Phase I Archaeological Survey Former Aliso Street MPG Site Los Angeles, California	Budinger, Fred E., Jr.(2003)	Yes
LA7552	Archaeological Monitor Report: Waste Line Trenching for the Cielito Restaurant Olvera Street, El Pueblo de Los Angeles	Hale, Alice (2000)	No
LA7558	Archaeological Monitor Report Alameda Street Improvements	Hale, Alice and Scott Savastio (2004)	No

NATIVE AMERICAN CONSULTATION

SWCA contacted the Native American Heritage Commission (NAHC) on November 14, 2006 requesting identification by the NAHC of any areas or geographic features in the project area that are listed within the NAHC's Sacred Lands File. The NAHC responded on November 16, 2006 with positive results. The NAHC also provided a list of five Native American individuals to be contacted for additional consultation. Letters and maps were sent to each of the five contacts provided by the NAHC, informing them of the project and inquiring if they were aware of any cultural resources with the project area or immediate vicinity.

To date, one response has been received from Anthony Morales of the Gabrielino-Tongva San Gabriel Band of Mission Indians. Mr. Morales responded via telephone on November 20, 2006 and discussed the project with SWCA archaeologist Kevin Hunt in detail on November 27, 2006. Mr. Morales very strongly recommends archaeological monitoring during all ground disturbing construction activities due to the vicinity of known Native American burials and artifacts. Mr. Morales further reiterated that the site is

extremely sensitive and also stated that his band is the "historical legitimate tribe" of the area. The complete Native American consultation correspondence is presented in Appendix B.

FIELD METHODS

SWCA archaeologist Emily Game conducted an intensive pedestrian survey of the two areas comprising the 8.23-acre project on November 16, 2006. The survey was conducted using parallel transects oriented east-west, spaced no greater than 10 meters apart and utilized a handheld global positioning system (GPS) unit to maintain transect accuracy. The entire parcel was inspected for archaeological and historic built-environment features. As asphalt and buildings covered approximately 98 percent of the project site and limited ground visibility, open areas where the ground surface was exposed were closely inspected.

FINDINGS

Asphalt and buildings covered approximately 98 percent of the project site, thus severely limiting ground visibility. The only portion of the project area that was not covered by buildings or asphalt was northern limits to the southern portion of the project area (Photograph 3). This area was heavily disturbed by landscaping. In addition, the ground in the remainder of the project area was covered with asphalt and used as parking lots, or covered with Metro related buildings (Photograph 4). Andersen Environmental's Phase I report for the project area (2006) documents the past uses of the project area since the 1880s, the likelihood of subsurface disturbance within portions of the project area, and that an adjacent property to the west of the project area was occupied by a cemetery in 1888.

The entire project area was thoroughly inspected; no historic or prehistoric cultural resources were identified within the project boundaries during the field survey.



Photograph 3. Disturbed and landscaped ground in southern portion of project area, facing east



Photograph 4. Northeast limit of project area showing bus-parking area, facing south

PROJECT EFFECTS ASSESSMENT

As mandated by Section 106 of the NHPA, federal agencies must take into account the effects of their undertakings on historic properties and seek ways to avoid, minimize, or mitigate adverse effects on such properties [36 CFR 800.1(a)]. Likewise, CEQA regulations state “a project that may cause a substantial adverse change in the significance of a historical resource is a project that may have a significant effect on the environment” (PRC Section 21084.1). “Substantial adverse change” means “demolition, destruction, relocation, or alteration such that the significance of an historical resource would be impaired” [PRC Section 5020.1(q)].

If an archaeological site qualifies for listing on the NRHP or CRHR, the provisions of Section 106 and CEQA mandate that the lead agencies further determine whether the proposed undertaking will have an “effect” and “adverse effect” upon the site [36 CFR 800.4(d)(1)]. According to federal regulations, “*Effect* means alteration to the characteristics of a historic property qualifying it for inclusion in or eligibility for the National Register” [36 CFR 800.16(i)]. The criteria of adverse effect are:

An adverse effect is found when an undertaking may alter, directly or indirectly, and of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property’s location, design, setting, materials, workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property’s eligibility for the National Register. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative. [36 CFR 800.5(a)(1)]

No cultural resources were identified within the project area during the thorough pedestrian survey at the project area as asphalt and the presence of modern buildings severely limited ground visibility. However, the records search and Native American consultation revealed the presence of both historic and prehistoric resources surrounding the project area. In addition, the 1900 *Pasadena, California* 15-minute quadrangle indicated the presence of a building within the project area at that time increasing the likelihood of buried historic period archaeological deposits. Four historic sites, and one multi-component site including a Native American cemetery and associated artifacts are recorded within 0.25 mile of the project. The 1888 Sanborn map described in Andersen Environmental's (2006) report notes that a cemetery was present adjacent to the west of the project area and that the project area was occupied by dwellings and stables at that time. The project area continued to be occupied since that time and transitioned from residential to commercial to industrial, as it remains today.

The project area and surrounding vicinity have evidence of human occupation in both historic and prehistoric periods. Based on the conditions of the project area during the survey, the presence of prehistoric sites in the project vicinity, and the history of use at the site, the project area has high potential to yield cultural resources.

MANAGEMENT CONSIDERATIONS AND RECOMMENDATIONS

FINDINGS OF EFFECTS

The area of potential effect (APE) for historic properties for the Metro Union Division Project is defined as one parcel adjacent to the project area (see Figure 2). Modern buildings predominantly surround the project area. Located directly north of the project area is the Twin Towers Correctional Facility, which was constructed in 1997 after an earthquake destroyed the Hall of Justice. The Twin Towers Correctional Facility is credited as being the world's largest jail (Wikipedia 2006b). East of the project area lays Metro owned property, which contains additional Metro buildings, including a paint and body shop, as well as parking areas. Further east is the Los Angeles River. West of the northern portion of the project area are six parcels of land, containing buildings of apparently modern construction. These buildings include numerous bail bond companies. Southeast of the northern portion of the project area and east of the southern portion lie 19 parcels of land that are occupied entirely by the Los Angeles Police Department's C. Erwin Piper Technical Center. West of the southern portion of the project area is the Metro Gateway Headquarters building. The buildings located within the historic properties APE are of modern construction and will not be adversely affected by the construction of the Metro Union Division Project.

A series of ornamental lampposts stylistically similar to the Macy Street Viaduct extend west from the Macy Street Viaduct along Cesar E Chavez Avenue past the project area, and also run south along North Vignes Street to the 101 Freeway (see Photograph 2 and Photograph 5). A number of these decorative lampposts are located within the APE. Although these lampposts appear historic in age, in a conversation with Ms. Shannon Daniels of TAHA, Mr. Stan Horwitz of the Los Angeles Department of Public Works, Bureau of Street Lighting, confirmed that these lanterns and poles were constructed and installed in 1995 and intended to look similar to the historic lampposts on the Macy Street Viaduct. While these lampposts help maintain historic character in the vicinity of the viaduct, they are not eligible for the NRHP and, as such, effects to these lampposts would not be adverse.



Photograph 5. Detail of ornamental lamppost facing south on North Vignes Street.

Los Angeles Union Station and the Macy Street Viaduct are outside of the formal historic properties APE for this project; however, potential adverse project-related visual effects to these historic architectural resources are considered individually below.

Union Station

The Metro Union Division Project will not result in adverse effects to the NRHP-listed Los Angeles Union Station. The station is predominantly obscured from direct view of the proposed project by existing multi-story buildings. In addition, the significant visual elements of Union Station are its façade, which faces west (away from the project area), and its interior.

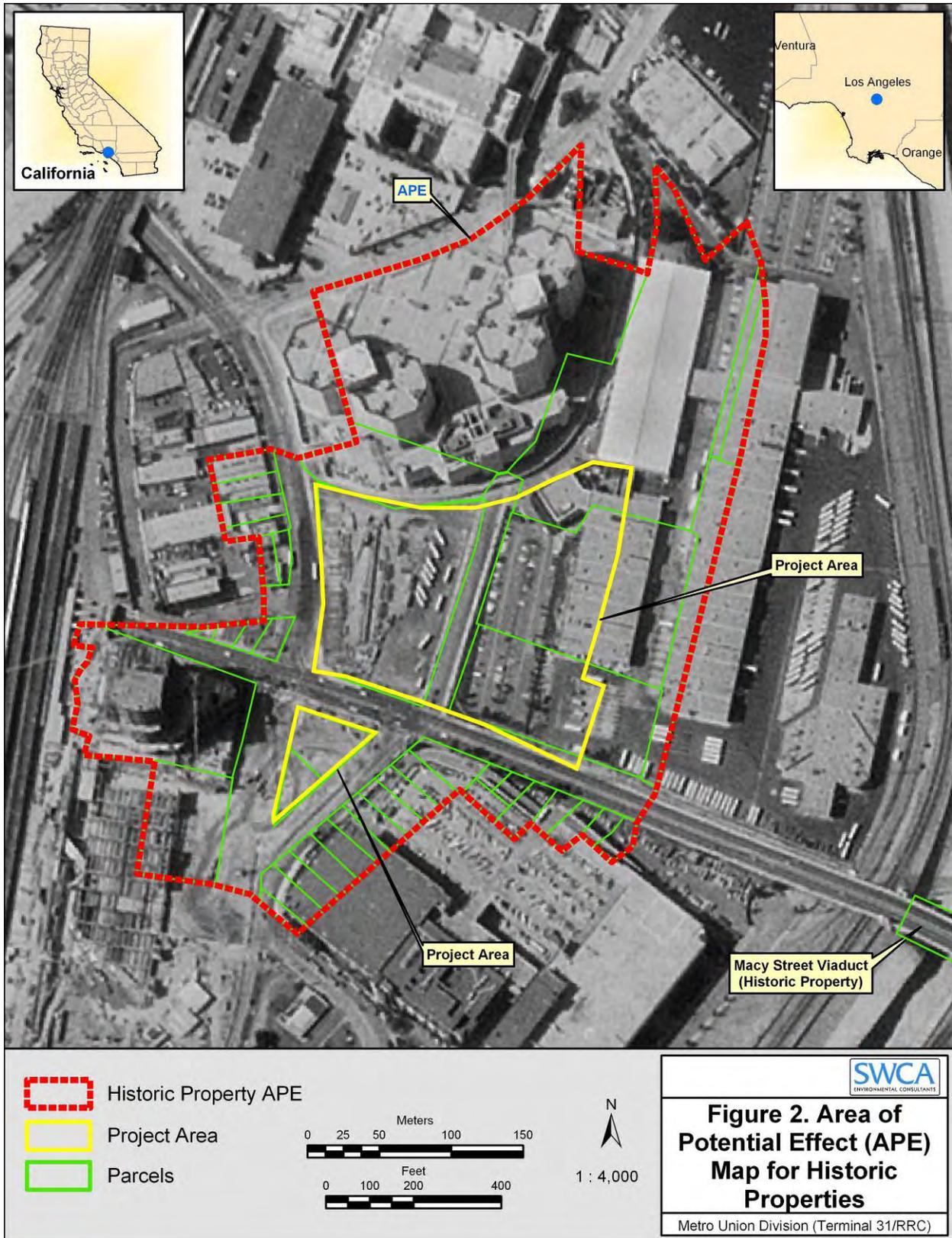


Figure 2. Area of Potential Effect for Historic Properties

Macy Street Viaduct

The Metro Union Division Project will not result in adverse effects to the City of Los Angeles Historic Cultural Monuments-listed Macy Street Viaduct. Although the proposed project (particularly the proposed pedestrian and vehicle bridge over Cesar E. Chavez Avenue) will be in direct view to and from the Macy Street Viaduct, the proposed project will not change the general nature of the view nor the setting. The project vicinity is industrial and heavily associated with transportation; the proposed project is appropriate to this environment. In addition, the significant visual elements of the Macy Street Viaduct are its porticos, light posts, and span; the Metro Union Division Project will not affect views of these elements, which are best viewed from the bridge itself or from along the river to the north or south.

Although both the Macy Street Viaduct and the Los Angeles Union Station are recognized as historically and architecturally significant, the construction of the Metro parking structure and pedestrian bridge do not adversely affect the visual integrity of the surrounding landscape.

RECOMMENDATIONS

The Metro Union Division project will not have adverse effects to known historic properties. Recommendations for the consideration and treatment of unanticipated discoveries are provided below.

Unanticipated Discoveries

The project has the potential to adversely affect buried historic and prehistoric archaeological resources. The following measures are recommended to mitigate potential adverse effects to buried cultural resources.

Construction Monitoring

Due to the possibility that buried archaeological resources could be present within the project site, SWCA recommends that a qualified archaeologist monitor all project-related ground-disturbing construction activities. Construction activity within stockpile or fill material does not require monitoring. In the event that cultural resources are exposed during construction, the monitor must be empowered to temporarily halt construction in the immediate vicinity of the discovery while it is evaluated for significance. Construction activities could continue in other areas. If the discovery proves to be significant, additional work, such as data recovery excavation, may be warranted.

Native American Monitor

The Gabrielino-Tongva San Gabriel Band of Mission Indians has recommended full-time Native American monitoring by a representative of the band. In the event that prehistoric or other apparently Native American resources are discovered during ground-disturbing construction activities, SWCA recommends that construction halt in the immediate vicinity of the discovery and a Native American monitor be retained to observe the treatment of the find, as well as any remaining ground-disturbing construction activity in the vicinity. If such discoveries are made in the absence of an archaeological monitor, the project archaeologist should also be contacted immediately to evaluate the find.

Human Remains

Procedures of conduct following the discovery of human remains have been mandated by Health and Safety Code §7050.5, Public Resources Code §5097.98, and the California Code of Regulations §15064.5(e) (CEQA). According to the provisions in CEQA, should human remains be encountered at the site, all work in the immediate vicinity of the burial must cease, and any necessary steps to ensure the integrity of the immediate area must be taken. The Los Angeles County Coroner will be immediately notified. The Coroner must then determine whether the remains are Native American. Once the Coroner determines the remains are Native American, the Coroner has 24 hours to notify the NAHC, who will in turn, notify the person they identify as the most likely descendent (MLD) of any human remains. Further actions will be determined in part by the recommendations of the MLD. The MLD has 24 hours following notification from the NAHC to make recommendations regarding the disposition of the remains of the discovery. If the MLD does not make recommendations within 24 hours, the owner shall, with appropriate dignity, reinter the remains in an area of the property secure from further disturbance. Alternatively, if the owner does not accept the MLD's recommendations, the owner or the descendent may request mediation by the NAHC.

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- 2004 The Use of Fired Clay Daub from CA-ORA-269 in the Identification of Prehistoric Dwelling Construction Methods, San Joaquin Hills, Orange County, California. Paper presented at the meeting of the Southern California Academy of Sciences, California State University, Long Beach, May 15, 2004.

Sutton, Mark Q.

- 1993 On the Subsistence Ecology of the "Late Inland Millingstone Horizon" in Southern California. *Journal of California and Great Basin Anthropology* 15(1):134-140.

Taşkıran, Ayşe

- 1997 Lithic Analysis. In *Hunting the Hunters: Archaeological Testing at CA-RIV-653 and CA-RIV-1098, Riverside County, California*, by Donn R. Grenda and Deborah W. Gray, pp. 41-53. Statistical Research Technical Series No. 65. Statistical Research, Inc., Tucson, Arizona.

Towner, Ronald H., Keith B. Knoblock, and Alex V. Benitez

- 1997 Flaked and Ground Stone Analyses. In *Continuity and Change: 8,500 Years of Lacustrine Adaptation on the Shores of Lake Elsinore* by Donn R. Grenda, pp. 167-248. Statistical Research Technical Series No. 59. Statistical Research, Inc., Tucson, Arizona.

True, Delbert L.

- 1958 An Early Complex in San Diego County, California. *American Antiquity* 23:255-263.
- 1993 Bedrock Milling Elements as Indicators of Subsistence and Settlement Patterns in Northern San Diego County, California. *Pacific Coast Archaeological Society Quarterly* 29(2):1-26.

Van Bueren, Thad M., Susan K. Goldberg, Michael J. Moratto, Portia Lee, and Jerrel H. Sorrenson

- 1989 *Inventory and Evaluation of Cultural Resources: Bolsa Chica Mesa and Huntington Beach Mesa, Orange County, California*. Prepared by Infotech Research, Inc. Report on file at the South Central Coastal Information Center, California State University, Fullerton.

Wallace, William J.

- 1955 A Suggested Chronology for Southern California. *Southwestern Journal of Anthropology* Vol. 11 No. 3, pp. 215-230.
- 1978 Post-Pleistocene Archaeology, 9000 to 2000 B.C. In *California*, edited by Robert F. Heizer, pp. 25-36. Handbook of North American Indians, Vol. 8, William G. Sturtevant, general editor, Smithsonian Institution, Washington D.C.

Warren, Claude N.

- 1967 The San Dieguito Complex: A Review and Hypothesis. *American Antiquity* 32:233-236.
- 1968 Cultural Tradition and Ecological Adaptation on the Southern California Coast. In *Archaic Prehistory in the Western United States*, edited by C. Irwin-Williams. Eastern New Mexico University Contributions in Anthropology 1(3):1-14, Portales.

Warren, Claude N., and D.L. True

- 1961 The San Dieguito Complex and its Place in California Prehistory. *Archaeological Survey Annual Report for 1960-1961*: 246-337. University of California, Los Angeles.
- 1984 The Desert Region. In *California Archaeology*, by Michael J. Moratto, with contributions by D.A. Fredrickson, C. Raven, and C. N. Warren, pp. 339-430. Academic Press, Orlando.

Wilke, Philip J.

- 1974 The Peppertree Site (4-Riv-463). In *Perris Reservoir Archeology: Late Prehistoric Demographic Changes in Southeastern California*, James F. O'Connell, Philip J. Wilke, Thomas F. King, and Carol L. Mix, eds., pp.49-63. California Department of Parks and Recreation Archeology Reports 14.
- 1978 Late Prehistoric Human Ecology at Lake Cahuilla, Coachella Valley, California. *Contributions of the University of California Archaeological Research Facility* No. 38.

Wikipedia

- 2006a Los Angeles County Metropolitan Transportation Authority. Electronic document accessed on November 22, 2006. Online at http://en.wikipedia.org/wiki/Los_Angeles_County_Metropolitan_Transportation_Authority.
- 2006b Twin Towers Correctional Facility. Electronic document accessed on December 8, 2006. Online at http://en.wikipedia.org/wiki/Twin_Towers_Correctional_Facility.
- 2006c Union Station (Los Angeles). Electronic document accessed on December 8, 2006. Online at [http://en.wikipedia.org/wiki/Union_Station_\(Los_Angeles\)](http://en.wikipedia.org/wiki/Union_Station_(Los_Angeles)).

Appendix A:
Records Search Results

South Central Coastal Information Center
California Historical Resources Information System
California State University, Fullerton
Department of Anthropology
800 North State College Boulevard
Fullerton, CA 92834-6846
714.278.5395 / FAX 714.278.5542
anthro.fullerton.edu/scbic.html - scbic@fullerton.edu

Ventura
Los Angeles
Orange

November 29, 2006

SCCIC # 7070.4300

Mr. Kevin Hunt
SWCA
625 Fair Oaks Avenue
Suite 190
South Pasadena, CA 91030
(626) 240-0587

RE: Records Search for MTA Union Division (Los Angeles Quadrangle)

Dear Mr. Hunt,

As per your request received on November 15, 2006, a records search was conducted for the above referenced project. The search includes a review of all recorded archaeological sites within a ¼-mile radius of the project site as well as a review of cultural resource reports on file. In addition, the California Points of Historical Interest (PHI), the California Historical Landmarks (CHL), the California Register of Historical Places (CR), the National Register of Historic Places (NR), the California State Historic Resources Inventory (HRI), and the City of Los Angeles Historic-Cultural Monuments listings were reviewed for the above referenced project. The following is a discussion of the findings.

Los Angeles, CA. USGS 7.5' Quadrangle

ARCHAEOLOGICAL RESOURCES:

Three archaeological sites (19-001381, 19-001575, and 19-003169) have been identified within a ¼-mile radius of the project site. None of the above archaeological sites are located within the project site. None of the above sites are listed on the Archaeological Determination of Eligibility (DOE) list. No isolates have been identified within a ¼-mile radius of the project site. No isolates are located within the project site.

HISTORIC RESOURCES:

One additional cultural resource (19-186110) has been identified within a ¼-mile radius of the project site. This cultural resource is not located within the project site.

Copies of our historic maps – Pasadena (1896 and 1900) 15' USGS - are enclosed for your review.

The California Point of Historical Interest (2006) of the Office of Historic Preservation, Department of Parks and Recreation, lists no properties within a ¼-mile radius of the project site.

The California Historical Landmarks (2006) of the Office of Historic Preservation, Department of Parks and Recreation, lists no properties within a ¼-mile radius of the project site.

The California Register of Historic Places (2006) lists one property within a ¼-mile radius of the project site (see National Register listing below). These are properties determined to have a National Register of Historic Places Status of 1 or 2, a California Historical Landmark numbering 770 and higher, or a Point of Historical Interest listed after 1/1/1998.

The National Register of Historic Places (2006) lists one property within a ¼-mile radius of the project site (see below).

Los Angeles-19-171159- Union Passenger Terminal 800 N. Alameda St. LA 19801113 80000811

The City of Los Angeles Historic-Cultural Monuments (2006) lists one property within a ¼-mile radius of the project site (see below).

No. 224 Macy Street Viaduct

This viaduct was built in 1926. Recognized for its distinguished architecture in the Spanish Colonial mode, it features ionic and doric columns with unique street lights inscribed with the City Seal. Located at the Cesar E. Chavez Avenue crossing of the Los Angeles River between Mission Road and Vignes Street. Declared: 8/1/79.

The California Historic Resources Inventory (2006) lists one property that has been evaluated for historical significance within a ¼-mile radius of the project site (see enclosed list).

PREVIOUS CULTURAL RESOURCES INVESTIGATIONS:

Twenty-nine studies (LA483, LA1476, LA1577, LA1642, LA1643, LA2577, LA2618, LA2644, LA2695*, LA2712, LA2713, LA2727, LA2788, LA3103, LA3151, LA3813, LA4048, LA4082, LA4219, LA4448, LA4625, LA4834, LA5131, LA5201, LA6344, LA6399, LA6840*, LA7552, and LA7558) have been conducted within a ¼-mile radius of the project site. Of these, two are located within the project site. There are twenty-five additional investigations located on the Los Angeles 7.5' USGS Quadrangle that are potentially within a ¼-mile radius of the project site. These reports are not mapped due to insufficient locational information.
(* = Located within the project site)

Please forward a copy of any reports from this project to the office as soon as possible. Due to the sensitive nature of archaeological site location data, we ask that you **do not include** records search maps in your report. If you have any questions regarding the results presented herein, contact the office at 714.278.5395 Monday through Thursday 8:00 am to 3:30 pm.

Should you require any additional information for the above referenced project, reference the SCCIC number listed above when making inquiries. Requests made after initial invoicing will result in the preparation of a separate invoice.

Sincerely,
SCCIC



Thomas David Shackford
Lead Staff Researcher

Enclosures:

- (X) Maps – Los Angeles 7.5' USGS Quadrangle, Pasadena 15' USGS Quadrangle – 10 pages
- (X) Bibliography – 5 pages
- (X) HRI – 1 page
- (X) Site Records – (19-001381, 19-001575, 19-003169, and 19-186110) – 27 pages
- (X) Confidentiality Form
- (X) Invoice # 7070.4300

Bibliography: MTA Union Division Records Search

IC ID#: LA7558 **DATE:** 2004 **PAGES:** 19

AUTHOR: Hale, Alice and Savastio, Scott

FIRM: Greenwood and Associates

TITLE: Archaeological Monitor Report Alameda Street Improvements

AREA: ~3000 ft

SITES: 19-000007x

QUADNAME: Los Angeles

MEMO:

IC ID#: LA7552 **DATE:** 2000 **PAGES:** 7

AUTHOR: Hale, Alice

FIRM: Greenwood and Associates

TITLE: Archaeological Monitor Report: Waste Line Trenching for the Cielito Lindo Restaurant Olvera Street, El Pueblo de Los Angeles

AREA: ~.25 ac

SITES: Nat. Reg. Hist. Dist.

QUADNAME: Los Angeles

MEMO: Nat. Reg. Hist. Dist.

Bibliography: MTA Union Division Records Search

IC ID#: LA4834 **DATE:** 1999 **PAGES:** 88

AUTHOR: Ashkar, Shahira

FIRM: Jones & Stokes Associates, Inc.

TITLE: Cultural Resources Inventory Report for Williams Communications, Inc. Proposed Fiber Optic Cable System Installation Project, Los Angeles to Anaheim, Los Angeles and Orange Counties

AREA: 23.5 line miles

SITES: 19-186110, 19-186111, 30-176630

QUADNAME: Hollywood, Los Angeles, South Gate, Whittier, Los Alamitas, Anaheim, Long Beach, La Habra

MEMO:

IC ID#: LA5131 **DATE:** 1999 **PAGES:** 4

AUTHOR: Iverson, Gary

FIRM: Caltrans District 7

TITLE: Negative Archaeological Survey Report: 119910

AREA: <>.25 li mi

SITES: none

QUADNAME: Los Angeles

MEMO:

IC ID#: LA5201 **DATE:** 2001 **PAGES:** 10

AUTHOR: Foster, John M.

FIRM: Greenwood And Associates

TITLE: Archaeological Assessment of the Proposed Hazardous Materials Storage Building at the Central Maintenance Facility, Los Angeles

AREA: <>10 ac

SITES: 19-001575H

QUADNAME: Los Angeles

MEMO:

Bibliography: MTA Union Division Records Search

IC ID#: LA4048 **DATE:** 1985 **PAGES:** 18

AUTHOR: Singer, Clay A.

FIRM:

TITLE: Archaeological Surface Surveys of Three Proposed Railway Connections in Downtown Los Angeles, Los Nietos/ Santa Fe Springs, and Colton, California

AREA: 2820 li ft.

SITES: None

QUADNAME: Los Angeles, Whittier

MEMO:

IC ID#: LA4082 **DATE:** 1982 **PAGES:** 13

AUTHOR: Romani, John

FIRM: Caltrans

TITLE: Archaeological Survey Report for the I-5 Transitway

AREA:

SITES: None

QUADNAME: Los Angeles, South Gate

MEMO:

IC ID#: LA4219 **DATE:** **PAGES:** 20

AUTHOR: Lee, Portia

FIRM:

TITLE: Seismic Retrofit of Macy Street Bridge over the Los Angeles River

AREA: 107 li ft

SITES: None

QUADNAME: Los Angeles

MEMO:

Bibliography: MTA Union Division Records Search

IC ID#: LA2713 **DATE:** 1980 **PAGES:** 75

AUTHOR: Weitze, Karen J.

FIRM: CALTRANS

TITLE: Aliso Street Historical Report El Monte Busway Extension in the City of Los Angeles 07-LA-101 P.M.O. to .5 07202-417801

AREA:

SITES: None

QUADNAME: Los Angeles

MEMO:

IC ID#: LA2727 **DATE:** 1992 **PAGES:** 30

AUTHOR: BROWN, JOAN C.

FIRM: RMW

TITLE: Archaeological Literature and Records Review and Impact Analysis for the Eastside Corridor Alternatives Los Angeles,

AREA: 50 li mi

SITES: 19-000007H,19-000887H,19-001112H,19-001575H

QUADNAME: Los Angeles

MEMO:

IC ID#: LA2788 **DATE:** 1992 **PAGES:** 29

AUTHOR: BROWN, JOAN C.

FIRM: RMW PALEO Associates, INCORPORATED

TITLE: Archaeological Literature and Records Review, and Impact Analysis for the Eastside Corridor Alternative Los Angeles, California

AREA: 50 li mi

SITES:

QUADNAME: Los Angeles

MEMO:

Bibliography: MTA Union Division Records Search

IC ID#: LA1643 **DATE:** 1981 **PAGES:** 150

AUTHOR: Costello, Julia G.

FIRM:

TITLE: Los Angeles Downtown People Mover Program Archaeological Resources Survey Phase 3

AREA:

SITES: None

QUADNAME: Los Angeles

Hollywood

MEMO:

IC ID#: LA2577 **DATE:** 1992 **PAGES:** 36

AUTHOR: Wlodarski, Robert J.

FIRM: H.E.A.R.T.

TITLE: Results of a Records Search Phase Conducted for the Proposed Alameda Corridor Project, Los Angeles County, California

AREA:

SITES: 19-000007,19-00098,19-000385,19-000389,19-000390,19-000887,19-001112H,19-001575H

QUADNAME: South Gate

Long Beach

MEMO:

IC ID#: LA2618 **DATE:** 1992 **PAGES:** 77

AUTHOR: Greenwood, Roberta S., John M. Foster and Judith A. Rasson

FIRM: Greenwood and Associates

TITLE: Historical and Archaeological Assessment of the Southern California Rapid Transit District (SCRTD) Union Station Headquarters Project

AREA:

SITES: 19-001575

QUADNAME: Los Angeles

MEMO:

DEPARTMENT OF CITY PLANNING
City of Los Angeles

HISTORIC-CULTURAL MONUMENT (HCM) REPORT

Level of declaration determined by number series as follows

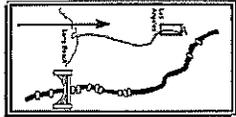
- 0 - 999 Series = City declared monuments
- 1000 - 1999 Series = State declared monuments
- 2000 - 2999 Series = Federal declared monuments

Note: Multiple listings are based on unique names and addresses supplied by the Departments of Cultural Affairs and Building

Last Updated: November 10, 2004

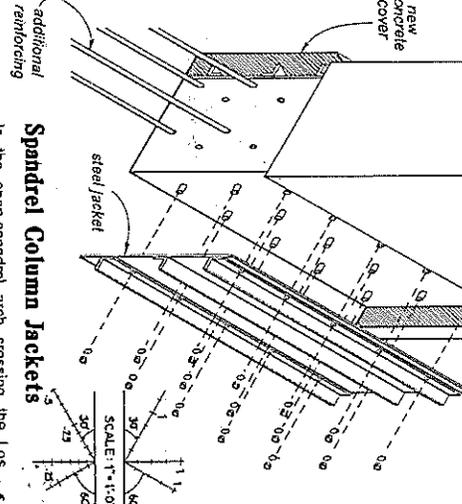
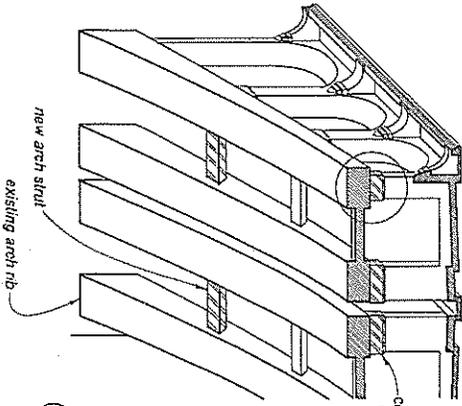
Community: Central City North

Monument No.	Date Adopted/ Approved	Monument Name	
82	06-16-1971	River Station Area (San Pedro Railroad)	1231 N. Spring St
101	08-02-1972	Los Angeles Union Station Passenger Terminal and Grounds	357 Aliso Street
* 101	08-02-1972	Los Angeles Union Station Passenger Terminal and Grounds	800-850 N. Alameda
211	03-07-1979	Granite Block Paving (Between Alameda and N. Main St.)	Bruno Street
* 224	08-01-1979	Macy Street Viaduct (between Mission & Vignes)	Cesar E. Chavez
281	08-07-1984	Cathedral High School	1253 Bishops Rd
795	05-04-2005	Santa Fe Inbound Freight House	355 South Santa
825	11-02-2005	Chinatown West Gate	954 N Hill St
826	11-02-2005	Chinatown East Gate	945 N Broadway
1011		Navy and Marine Corps Reserve Center (SM#972)	1700 Stadium W
2177	01-11-1985	Post Office Terminal Annex	900 N. Alameda
* 2346	11-13-1980	Los Angeles Union Station Passenger Terminal and Grounds	800-850 N. Alameda
2448		Bernard Street Residence	411-415 Bernard
2449		Bernard Street Residence	706 Bernard Street



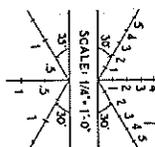
The Macy Street Bridge, designed under the direction of Merrill Butler, was completed in 1926. The reinforced concrete design was appropriately monumental, not only as a crossing into downtown Los Angeles, but also as part of the historic El Camino Real. In 1994, Macy Street was renamed in honor of the agricultural labor organizer Cesar E. Chavez.

CESAR CHAVEZ AVE VIADUCT



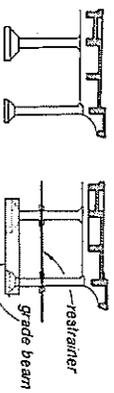
Spandrel Column Jackets

In the open-spandrel arch crossing the Los Angeles River, the spandrel columns were strengthened with steel jackets. The jackets were fitted by running additional reinforcement through the columns than bolting steel plates onto the face of the concrete.

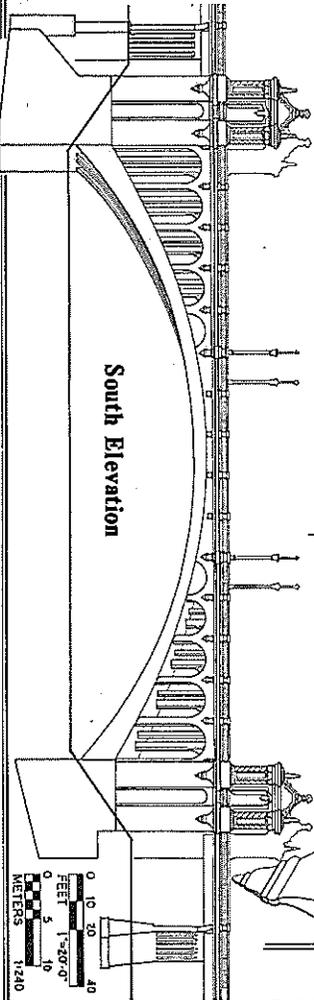


Seismic Retrofit

Completed in 1995, the retrofit included joining the footings of bent supports in pairs. Now acting as a two-column frame, the bents will provide greater moment resistance during transverse loading.



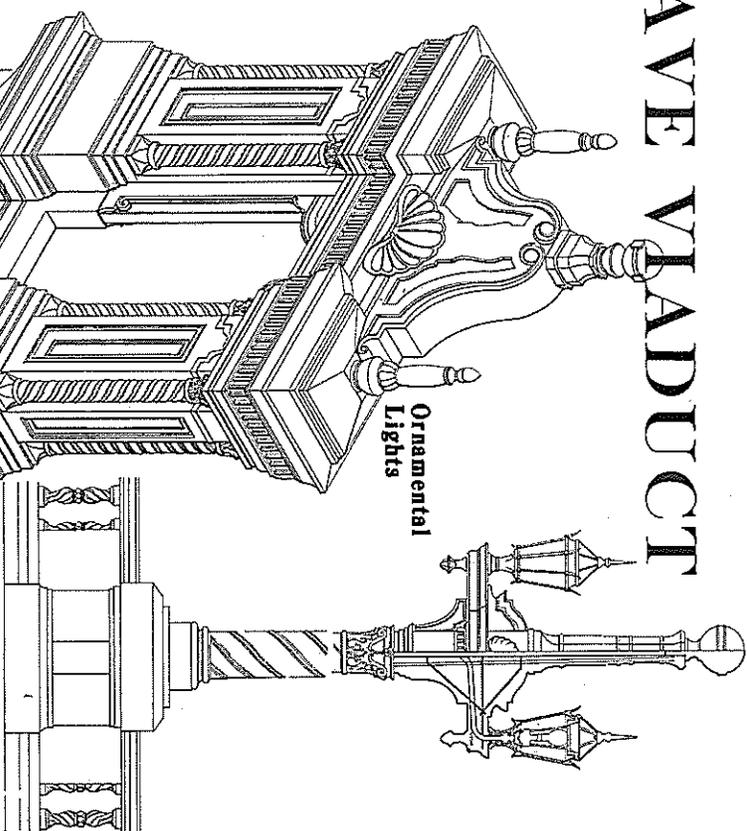
The retrofit included placing restrainers across the joints to unify the bridge deck.



South Elevation



Ornamental Lights



Spanish Revival Ornamentation

Established under the Spanish Crown, El Camino Real extended from Loreto, Baja California to Soledad, California. Friar Junipero Serra, to whom the bridge is dedicated, established the missions in Alta California along the route. To highlight its location along El Camino Real, Macy Street Bridge was decorated with elements taken from the Spanish Baroque style. The bridge's colossal porticoes include spiral columns with embellished capitals, a finely articulated cornice, astracaded stairhalls, and a replica of the city seal.

Macy Street Viaduct
1926
 MERRILL BUTLER
 ATKINSON ARCHT. CO.
 1270 R. LONG BLVD. #1111 1915

DELINEATED BY JASON CURRIE 2000
 LOS ANGELES RIVER BRIDGES
 RECORDING PROJECT
 NATIONAL PARK SERVICE
 UNITED STATES DEPARTMENT OF THE INTERIOR

LOS ANGELES

MACY STREET VIADUCT 1926
 CESAR CHAVEZ AVENUE SPANNING LOS ANGELES RIVER
 LOS ANGELES COUNTY

CALIFORNIA

1" = 1'

SHEET
 HISTORIC AMERICAN
 ENGINEERING RECORD
 CA 277

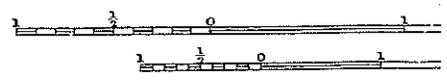


Pasadena, Calif. 15'
1896



34°00' 118'15" (Watts 2400)
 ENGRAVED MAR. 1896 BY U.S.G.S.
 Henry Gannett, Chief Topographer.
 R.U. Goode, Geographer in charge.
 Triangulation by A.P. Davis.
 Topography by L.C. Fletcher and T.G. Gerdine.
 Surveyed in 1894.

Fletcher
Gerdine
Fletcher



Contour
 Dot

"REPRODUCED BY 30TH ENGR. (TOP) BN., FT. BELVOIR, VA. 1942"
 FROM NEGATIVES FURNISHED BY A. M. S.

Pasadena, CA 15'
 1900

Appendix B:
Native American Consultation

Fax

To: Rob Wood- California Native American Heritage Commission
From: Kevin Hunt

Fax: (916) 657-5390

Pages: 2

Phone: (916) 653-4040

Date: 11/15/2006

Re: Sacred lands file search request for a project in Los Angeles County
CC:

Urgent For Review Please Comment Please Reply Please Recycle

• **Comments:**

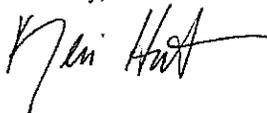
Dear Mr. Wood,

I am requesting a records search of the Sacred Lands File, and a list of appropriate Native American contacts for a project located within Los Angeles County, California. The project, known as "Cultural Resources Study for the MTA Union Division Project, Los Angeles County, California" comprises approximately 8.23 acres of developed land in the Los Angeles County to be redeveloped. The study area falls within portions of the USGS 7.5-minute *Los Angeles, Calif.* quadrangle and is located within unsectioned City of Los Angeles Lands. The study area includes the entire area outlined. I am requesting the following information:

- Groups or individuals listed by the NAHC as contacts for Los Angeles County.
- Identification by the NAHC of any sacred lands in the area that are listed within the Sacred Lands File.

Thank you for your attention to this request.

Sincerely,



Kevin Hunt- SWCA Cultural Resources Project Manger



 Project Area





UTM 11N Zone
 Los Angeles 1983
 Projection: UTM
 Map Revision: 0004



Figure 1
Project Location

MTA Union Station (Terminal 31/32/33)

STATE OF CALIFORNIA

Arnold Schwarzenegger, Governor

NATIVE AMERICAN HERITAGE COMMISSION

915 CAPITOL MALL, ROOM 364
 SACRAMENTO, CA 95814
 (916) 653-6251
 Fax (916) 657-5390
 Web Site www.nahc.ca.gov
 e-mail: da_nahc@pacbell.net



November 16, 2006

Mr. Kevin Hunt, Cultural Resources Project Manager
SWCA Environmental Consultants
 625 Fair Oaks Avenue, Suite 190
 South Pasadena, CA 91030

Sent by FAX to: 626-240-0607
 Number of pages: 3

Re: Cultural Resource Identification Study/Sacred Lands File Search for Proposed MTA Union
 Division Project, City of Los Angeles; Los Angeles County, California

Dear Kevin:

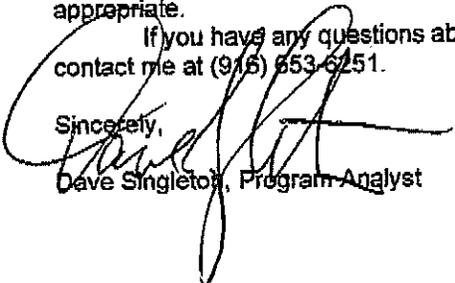
The Native American Heritage Commission was able to perform a record search of its Sacred Lands File (SLF) for the affected project area. The SLF did indicate the presence of Native American cultural resources in the immediate project area or 'area of potential effect (APE).'

Early consultation with Native American tribes in your area is the best way to avoid unanticipated discoveries once a project is underway. Enclosed is the name of the nearest tribes that may have knowledge of cultural resources in the project area: Anthony Morales of the Gabrieleno/Tongva Tribal Council (626) 286-1758 (Home). Also A list of Native American contacts is attached to assist you beyond the initial contact. In addition, if the Area of Project Effect (APE) is east of Alameda Street; south of the Union Station Passenger Terminal and near El Pueblo de Los Angeles; then the APE is in an extremely culturally sensitive area. This area was identified during the construction of the headquarters for the Metropolitan Water District and there is an 'Arc Citation' (CA-LAN-1575/H, 1998) which is in addition to what is in the NAHC Sacred Lands File inventory. The Commission makes no recommendation of a single individual or group over another. It is advisable to contact the person listed; if they cannot supply you with specific information about the impact on cultural resources, they may be able to refer you to another tribe or person knowledgeable of the cultural resources in or near the affected project area. Also, Mr. Morales is encouraged to contact us.

Also, a lack of surface evidence of archeological resources does not preclude the existence of archeological resources. Lead agencies should consider avoidance, as defined in Section 15370 of the California Environmental Quality Act (CEQA) when significant cultural resources could be affected by a project. Also, Public Resources Code Section 15064.5(f) and Section 15097.98 and Health & Safety Code Section 7050.6 provide for provisions for accidentally discovered archeological resources during construction and mandate the processes to be followed in the event of an accidental discovery of any human remains in a project location other than a 'dedicated cemetery. Discussion of these should be included in your environmental documents, as appropriate.

If you have any questions about this response to your request, please do not hesitate to contact me at (916) 653-6251.

Sincerely,


 Dave Singleton, Program Analyst

Attachment: Native American Contact List

**Native American Contacts
Los Angeles County
November 16, 2006**

LA City/County Native American Indian Comm
Ron Andrade, Director
3175 West 6th Street, Rm. 403
Los Angeles , CA 90020

(213) 351-5324

(213) 386-3995 FAX

Gabrieleno/Tongva Tribal Council
Anthony Morales, Chairperson
PO Box 693
San Gabriel , CA 91778

Gabrielino Tongva

(626) 286-1632

(626) 286-1758 - Home

(626) 286-1262 Fax

Gabrielino/Tongva Council / Gabrielino Tongva Nation
Sam Dunlap, Tribal Secretary
501 Santa Monica Blvd., Suite 500
Santa Monica , CA 90401-2415

Gabrielino Tongva

(310) 587-2203

(310) 587-2281 Fax

Gabrielino Tongva Indians of California Tribal Council
Robert Dorame, Tribal Chair/Cultural Resources
4540 Slauson, Ave. Suite 151 PMB
Culver City , CA 90230

Gabrielino Tongva

gtongva@earthlink.

562-761-6417 - voice

562-920-9449 - fax

Gabrielino Tongva Indians of California Tribal Council
Mercedes Dorame, Tribal Administrator
20990 Las Flores Mesa Drive
Malibu , CA 90265
Pluto05@hotmail.com

Gabrielino Tongva

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of statutory responsibility as defined in Sec. 7050.5 of the Health & Safety Code, Sec. 5097.94 of the Public Resources Code and Sec. 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources for the proposed DMTA Union Division Project; City of Los Angeles; Los Angeles County, California for which a Sacred Lands File was requested.

November 17, 2006

Contact Name
Band or Tribe Affiliation
Address 1
Address 2

Dear Contact Name,

SWCA Environmental Consultants has been retained to provide cultural resources services for the proposed Metropolitan Transit Authority (MTA) Union Division Project in the City of Los Angeles, California. The proposed project will redevelop an existing MTA parking lot and bus maintenance facility into a three-story parking structure including the bus maintenance facility.

As part of the process in identifying cultural resources issues on this project, the Native American Heritage Commission (NAHC) was contacted by SWCA to conduct a Sacred Lands File search and provide a list of Native American individuals and/or tribal organizations that may have knowledge of cultural resources in or near the project area. The NAHC search indicated the presence of "Native American cultural resources in the immediate project area or 'area of potential effect (APE).'" The Sacred Lands File search also indicated the presence of a previously recorded archaeological site near, but outside of the current project area (CA-LAN-1575/H), identified at the present location of the Metropolitan Water District headquarters, approximately 0.5 mile outside of the MTA Union Division Project Area.

The MTA Union Division project area is located at the intersection of Cesar Chavez Boulevard and Vignes Street, within unsectioned City of Los Angeles lands. The project area and a 0.25-mile search radius are depicted on a portion of the *Los Angeles, California 7.5'* USGS Quadrangle (1966, Photorevised 1981; see attached figure).

If you have any knowledge of cultural resources that may exist within or near the project area and wish to have your concerns considered, please contact Kevin Hunt at (626) 240-0587, khunt@swca.com, or the above address, at your earliest convenience.

This consultation is project-specific and is not intended to constitute SB 18 consultation, should that be required for this project.

We would greatly appreciate hearing from you if you know of any cultural resources or other concerns that might be within the proposed project area. Thank you for your assistance.

Sincerely,
SWCA Environmental Consultants

Kevin Hunt
Project Manager – Cultural Resources

Enclosure: Map

Kevin Hunt

From: Cara Corsetti [ccorsetti@swca.com]
Sent: Monday, November 20, 2006 4:07 PM
To: Kevin Hunt
Subject: MTA Union Division - Tribal Consultation

Hi Kevin,

Anthony Morales, Tribal Chair and MLD of the Gabrielino tribe in San Gabriel called about MTA Union Division. He said the tribe has serious concerns about the project and that it is in a very sensitive area. He would like Archaeo & Native American monitoring done during construction for sure. I basically just listened to his concerns and said you would be getting back to him to follow up. His # is 626-286-1758. I told him you would be out until next week so he isn't expecting a follow up call until then...

Thanks,
Cara

Cara Corsetti
Program Director
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CONVERSATION RECORD

DATE 11/27/2006 TIME 2:30 A.M. P.M.

NAME OF CONTACT Mr. Anthony Morales

COMPANY/AGENCY Gabrielino-Tongva San Gabriel Band of Mission Indians

PHONE NUMBER 626.286.1758

PROJECT NAME MTA Union Division PROJECT NO. 12191-191

Notes:

Kevin Hunt returned Anthony's call (he had left a message on November 20, 2006) regarding this project. We discussed the project and Anthony stated that the project area was within the "major village limits of Yangna." He recalled the excavations for the MWD (Metropolitan Water District of Southern California) building nearby that produced human remains and Native American artifacts.

Anthony stated that he very strongly recommends archaeological and Native American monitoring of all ground-disturbing construction activities for the MTA Union Division project. He reiterated that the site is extremely sensitive and that his band is the "historical legitimate tribe" of the area. He further stated that if no monitoring were undertaken, his band would object strongly and make their opinion known to their contacts at Los Angeles City Hall and Los Angeles County.

I assured Anthony that his concerns would be included in SWCA's technical report and that I concurred that archaeological and Native American monitoring should occur for this project.

RECORDED BY: Kevin Hunt

APPENDIX D

Paleontological Assessment

**Revised Paleontological Assessment of
the Metro Union Division Bus
Maintenance and Operations Facility
Project, Los Angeles, Los Angeles County,
California**

Prepared for

Terry A. Hayes Associates

and

**Los Angeles County Metropolitan Transportation
Authority (Metro)**

Prepared by

SWCA Environmental Consultants

Pasadena Office

October 25, 2007

**PALEONTOLOGICAL ASSESSMENT
METRO UNION DIVISION BUS MAINTENANCE AND OPERATIONS FACILITY PROJECT, LOS ANGELES,
LOS ANGELES COUNTY, CALIFORNIA**

SWCA PROJECT NUMBER 12191-191

SUBMITTED TO:

Terry A. Hayes Associates
8522 National Boulevard, Suite 102
Culver City, California 90232

SUBMITTED BY:

SWCA Environmental Consultants
625 Fair Oaks Avenue, Suite 190
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Jessica L. DeBusk, SWCA Project Manager – Paleontology



Cara Corsetti, Qualified Paleontologist and SWCA Program Director – Paleontology

PROJECT SUMMARY

PURPOSE AND SCOPE

SWCA Environmental Consultants was retained by Terry A. Hayes Associates for the Metropolitan Transit Authority (MTA or Metro) to conduct paleontological resources services for the Metro Union Division Bus Maintenance and Operations Facility project located in the City of Los Angeles, Los Angeles County, California. The scope of services included (1) a comprehensive literature review, (2) a museum records search, and (3) preparation of this technical report of findings that includes recommended mitigation measures.

DATES OF INVESTIGATION

The museum records search was performed on November 17, 2006. This technical report was completed on December 11, 2006, and revised to address Metro comments on October 25, 2007.

RESULTS OF THE INVESTIGATION

According to geologic mapping by Dibblee (1989), the project area is immediately underlain by Quaternary alluvium of Holocene age, which is in turn underlain by the Puente Formation of Late Miocene age. Museum collection records maintained by the Natural History Museum of Los Angeles County (LACM) indicate that at least two fossil localities yielding scientifically significant vertebrate specimens have been documented nearby the project area within the paleontologically sensitive Puente Formation (McLeod, 2006).

The combined results of the literature review and museum records search indicate that the geologic units underlying the project area are determined to have a paleontological sensitivity rating ranging from low to high. Therefore, any project-related ground disturbances may result in an adverse impact to non-renewable fossil resources unless proper mitigation measures are implemented.

RECOMMENDATIONS

SWCA **highly** recommends that a qualified paleontologist be retained to design and implement a paleontological monitoring and mitigation plan during any ground disturbing activities related to the proposed development within the project area. All fossils recovered during the paleontological monitoring and mitigation program should be prepared, stabilized, identified, and permanently curated in an approved repository or museum (such as the LACM).

DISPOSITION OF DATA

This report will be filed with Terry A. Hayes Associates and MTA. A copy will be retained at SWCA Environmental Consultants, along with maps and all other records relating to the project.

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INTRODUCTION

This report presents the findings of a comprehensive literature review and museum records search conducted for the Metro Union Division Bus Maintenance and Operations Facility project located in the City of Los Angeles, Los Angeles County, California. This study was performed in order to evaluate the paleontological sensitivity of the project area and vicinity, assess potential project-related impacts on paleontological resources, and provide recommendations for project-specific mitigation measures. This study was conducted in accordance with the professional guidelines established by the Society of Vertebrate Paleontology (SVP) (1995) and the City of Los Angeles.

DEFINITION AND SIGNIFICANCE OF PALEONTOLOGICAL RESOURCES

Paleontology is a multidisciplinary science that combines elements of geology, biology, chemistry, and physics in an effort to understand the history of life on earth. Paleontological resources, or fossils, are the remains, imprints, or traces of once-living organisms preserved in rocks and sediments. These include mineralized, partially mineralized, or unmineralized bones and teeth, soft tissues, shells, wood, leaf impressions, footprints, burrows, and microscopic remains. The fossil record is the only evidence that life on earth has existed for more than 3.6 billion years. Fossils are considered non-renewable resources because the organisms they represent no longer exist. Thus, once destroyed, a fossil can never be replaced. Fossils are an important scientific and educational resource because they are used to:

- Study the phylogenetic relationships between extinct organisms, as well as their relationships to modern groups
- Elucidate the taphonomic, behavioral, temporal, and diagenetic pathways responsible for fossil preservation, including biases in the fossil record
- Reconstruct ancient environments, climate change, and paleoecological relationships
- Provide a measure of relative geologic dating, which forms the basis for biochronology and biostratigraphy, and which is an independent and supporting line of evidence for isotopic dating
- Study the geographic distribution of organisms and tectonic movements of landmasses and ocean basins through time
- Study patterns and processes of evolution, extinction, and speciation
- Identify past and potential future human-caused effects to global environments and climates

RESOURCE ASSESSMENT GUIDELINES

Paleontological resources are limited, non-renewable resources of scientific, cultural, and educational value and are afforded protection under federal (National Environmental Policy Act, or NEPA), state (California Environmental Quality Act, or CEQA), and local (City of Los Angeles) laws and regulations. This study satisfies project requirements in accordance with CEQA (13 PRC, 2100 et seq.), NEPA (Sec. 101 [42 USC § 4321]) (#382), and Public Resources Code Section 5097.5 (Stats 1965, c 1136, p. 2792). This analysis also complies with guidelines and significance criteria specified by the SVP (1995).

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

Fossils are classified as non-renewable scientific resources and are protected by various laws, ordinances, regulations, and standards (LORS) across the country. The SVP (1995) has established professional standards for the assessment and mitigation of adverse impacts to paleontological resources. This paleontological assessment was conducted in accordance with the LORS which are applicable to paleontological resources within the project area.

PROFESSIONAL STANDARDS

The SVP has established standard guidelines (SVP, 1995) that outline professional protocols and practices for the conducting of paleontological resource assessments and surveys, monitoring and mitigation, data and fossil recovery, sampling procedures, and specimen preparation, identification, analysis, and curation. Most practicing professional vertebrate paleontologists adhere closely to the SVP's assessment, mitigation, and monitoring requirements as specifically provided in its standard guidelines. Most state regulatory agencies with paleontological LORS accept and utilize the professional standards set forth by the SVP.

As defined by the SVP (1995:26), significant nonrenewable paleontological resources are defined as:

...Fossils and fossiliferous deposits here restricted to vertebrate fossils and their taphonomic and associated environmental indicators. This definition excludes invertebrate or paleobotanical fossils except when present within a given vertebrate assemblage. Certain invertebrate and plant fossils may be defined as significant by a project paleontologist, local paleontologist, specialists, or special interest groups, or by lead agencies or local governments.

As defined by the SVP (1995:26), significant fossiliferous deposits are defined as:

A rock unit or formation which contains significant nonrenewable paleontologic resources, here defined as comprising one or more identifiable vertebrate fossils, large or small, and any associated invertebrate and plant fossils, traces and other data that provide taphonomic, taxonomic, phylogenetic, ecologic, and stratigraphic information (ichnites and trace fossils generated by vertebrate animals, e.g., trackways, or nests and middens which provide datable material and climatic information). Paleontologic resources are considered to be older than recorded history and/or older than 5,000 years BP [before present].

Based on the significance definitions of the SVP (1995), all identifiable vertebrate fossils are considered to have significant scientific value. This position is adhered to because vertebrate fossils are relatively uncommon, and only rarely will a fossil locality yield a statistically significant number of specimens of

the same genus. Therefore, every vertebrate fossil found has the potential to provide significant new information on the taxon it represents, its paleoenvironment, and/or its distribution. Furthermore, all geologic units in which vertebrate fossils have previously been found are considered to have high sensitivity. Identifiable plant and invertebrate fossils are considered significant if found in association with vertebrate fossils or if defined as significant by project paleontologists, specialists, or local government agencies.

A geologic unit known to contain significant fossils is considered to be “sensitive” to adverse impacts if there is a high probability that earth-moving or ground-disturbing activities in that rock unit will either disturb or destroy fossil remains directly or indirectly. This definition of sensitivity differs fundamentally from the definition for archaeological resources as follows:

It is extremely important to distinguish between archaeological and paleontological (fossil) resource sites when defining the sensitivity of rock units. The boundaries of archaeological sites define the areal extent of the resource. Paleontologic sites, however, indicate that the containing sedimentary rock unit or formation is fossiliferous. The limits of the entire rock formation, both areal and stratigraphic, therefore define the scope of the paleontologic potential in each case [SVP, 1995].

Many archaeological sites contain features that are visually detectable on the surface. In contrast, fossils are contained within surficial sediments or bedrock, and are therefore not observable or detectable unless exposed by erosion or human activity. In summary, paleontologists cannot know either the quality or quantity of fossils prior to natural erosion or human-caused exposure. As a result, even in the absence of surface fossils, it is necessary to assess the sensitivity of rock units based on their known potential to produce significant fossils elsewhere within the same geologic unit (both within and outside of the study area), a similar geologic unit, or based on whether the unit in question was deposited in a type of environment that is known to be favorable for fossil preservation. Monitoring by experienced paleontologists greatly increases the probability that fossils will be discovered during ground-disturbing activities and that, if these remains are significant, successful mitigation and salvage efforts may be undertaken in order to prevent adverse impacts to these resources.

PALEONTOLOGICAL SENSITIVITY

Paleontological sensitivity is defined as the potential for a geologic unit to produce scientifically significant fossils. This is determined by rock type, past history of the geologic unit in producing significant fossils, and fossil localities recorded from that unit. Paleontological sensitivity is derived from the known fossil data collected from the entire geologic unit, not just from a specific survey. In its “Standard Guidelines for the Assessment and Mitigation of Adverse Impacts to Non-renewable Paleontologic Resources,” the SVP (1995:23) defines four categories of paleontological sensitivity (potential) for rock units: high, low, undetermined, and no potential:

- **High Potential.** Rock units from which vertebrate or significant invertebrate fossils or suites of plant fossils have been recovered and are considered to have a high potential for containing significant non-renewable fossiliferous resources. These units include, but are not limited to, sedimentary formations and some volcanic formations that contain significant non-renewable paleontologic resources anywhere within their geographical extent and sedimentary rock units temporally or lithologically suitable for the preservation of fossils. Sensitivity comprises both (a) the potential for yielding abundant or significant vertebrate fossils or for yielding a few significant fossils, large or small, vertebrate, invertebrate, or botanical, and (b) the importance of recovered evidence for new and significant taxonomic, phylogenetic, ecologic, or stratigraphic

data. Areas that contain potentially datable organic remains older than Recent, including deposits associated with nests or middens, and areas that may contain new vertebrate deposits, traces, or trackways are also classified as significant.

- **Low Potential.** Reports in the paleontological literature or field surveys by a qualified vertebrate paleontologist may allow determination that some areas or units have low potentials for yielding significant fossils. Such units will be poorly represented by specimens in institutional collections.
- **Undetermined Potential.** Specific areas underlain by sedimentary rock units for which little information is available are considered to have undetermined fossiliferous potentials.
- **No Potential.** Metamorphic and granitic rock units do not yield fossils and therefore have no potential to yield significant non-renewable fossiliferous resources.

For geologic units with high potential, full-time monitoring is generally recommended during any project-related ground disturbance. For geologic units with low potential, protection or salvage efforts will not generally be required. For geologic units with undetermined potential, field surveys by a qualified vertebrate paleontologist should be conducted to specifically determine the paleontologic potential of the rock units present within the study area.

PROJECT LOCATION

The project is located at 920 North Vignes Street at the northeast corner of the Vignes Street and Cesar Chavez Avenue intersection in eastern downtown Los Angeles, California. The project area is located on the Los Angeles, CA U.S.G.S. 7.5-minute Quadrangle (1966, Photorevised 1981) (Figure 1).

PROJECT PERSONNEL

SWCA paleontologist Jessica DeBusk requested the museum records search, reviewed published and unpublished literature, and authored this technical report. GIS Specialist Daniel St. Germain produced graphics. Technical Editor Russ Gatlin edited and formatted this report. Cara Corsetti, Qualified Paleontologist and SWCA Paleontology Program Director, provided quality assurance and quality control and supervised all paleontological work.

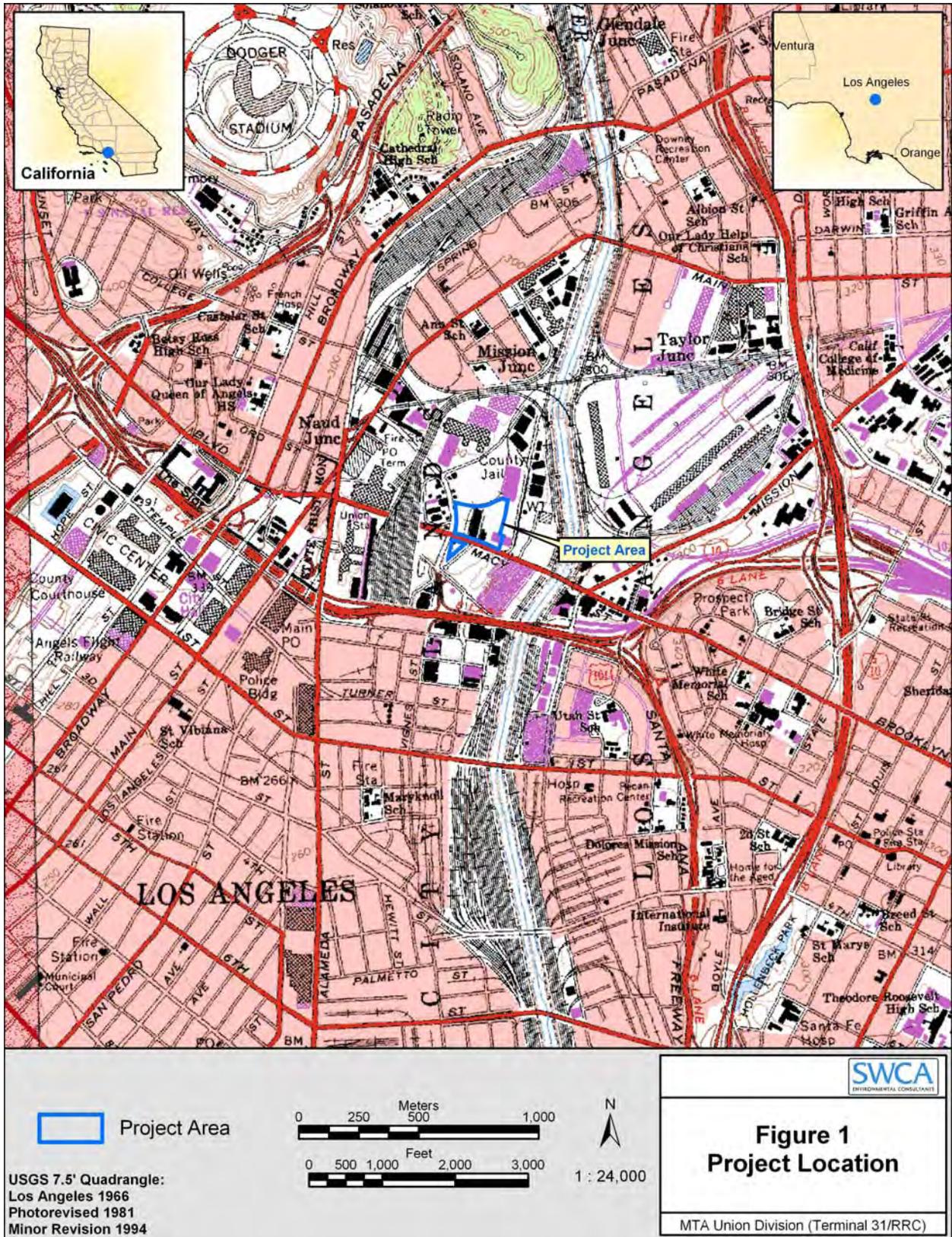


Figure 1. Project Location Map

METHODS

Due to the nature of the fossil record, paleontologists cannot know either the quality or the quantity of fossils present in a given geologic unit prior to natural erosion or human-caused exposure. Therefore, in the absence of surface fossils, it is necessary to assess the sensitivity of rock units based on their known potential to produce scientifically significant fossils elsewhere within the same geologic unit (both within and outside of the study area) or a unit representative of the same depositional environment.

A detailed review of museum collections records was performed by the Vertebrate Paleontology division of the LACM for the purposes of (1) determining whether there are any known fossil localities in or near the project area, (2) identifying the geologic units present in the project area, and (3) determining the paleontological sensitivity ratings of those geologic units in order to assess potential impacts to nonrenewable paleontological resources.

In addition to the records search, published and unpublished literature and geologic maps were reviewed, and mitigation measures specific to this project were developed in accordance with the SVP (1995). A paleontological sensitivity map was created using these findings (Figure 2).

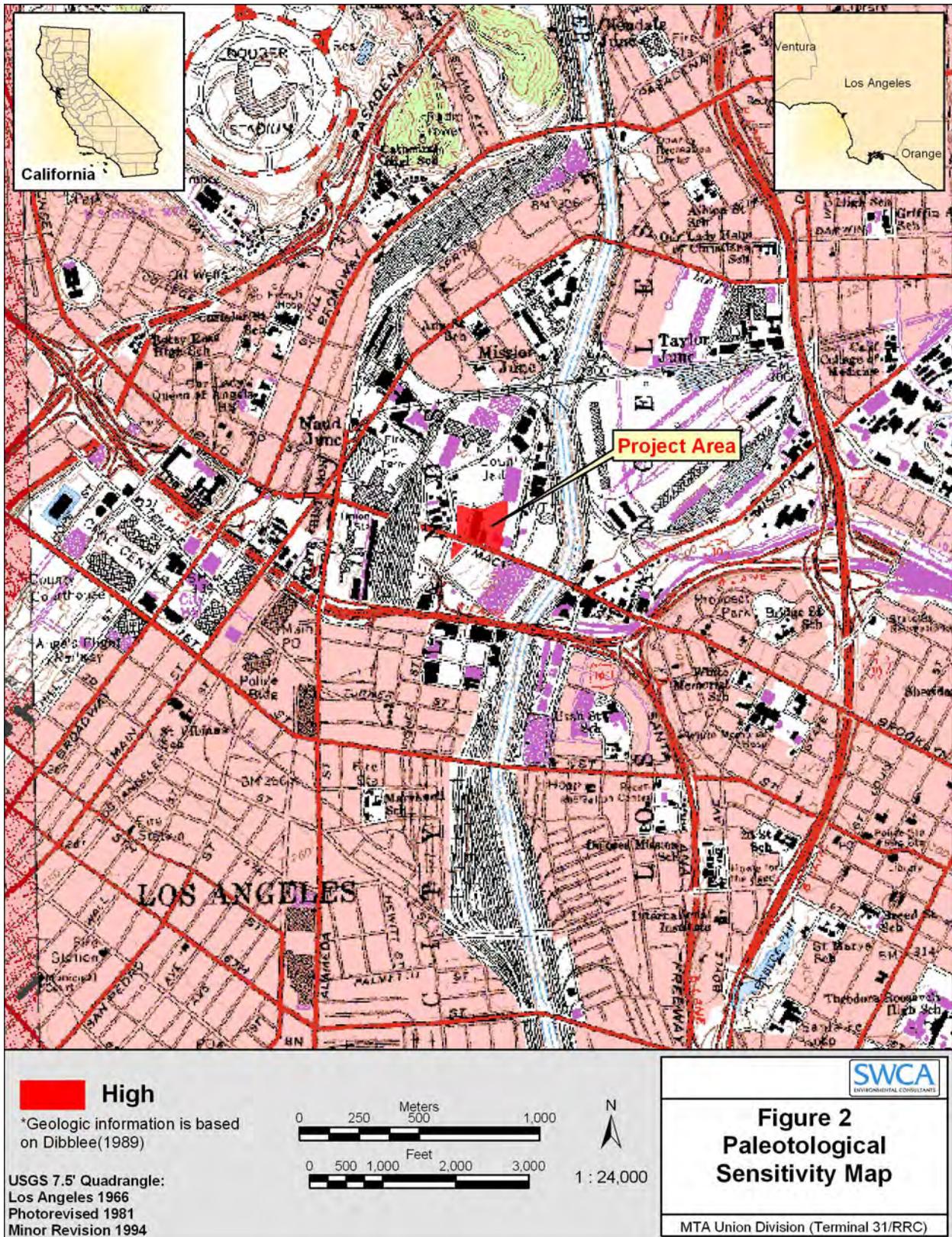


Figure 2. Paleontological Sensitivity Map

GEOLOGY AND PALEONTOLOGY

GEOLOGIC SETTING

California is naturally divided into the following twelve geomorphic provinces, each distinguished from one another by having unique topographic features and geologic formations: (1) the Sierra Nevada, (2) the Klamath Mountains, (3) the Cascade Range, (4) the Modoc Plateau, (5) the Basin and Range, (6) the Mojave Desert, (7) the Colorado Desert, (8) the Peninsular Ranges, (9) the Transverse Ranges, (10) the Coast Ranges, (11) the Great Valley, and (12) the Offshore area. The Los Angeles basin and San Gabriel basin occupy a transitional zone between the east-trending Transverse Ranges to the north and the northwest-trending Peninsular Ranges to the south.

The project area is situated in the southwestern block of the Los Angeles basin. The Los Angeles basin is one of many basins comprising the Neogene continental borderland of southern California. It extends from the Santa Ana Mountains in the north to the San Joaquin Hills to the south, and includes the southern foothills of the San Gabriel Mountains, the Puente Hills, and the Palos Verdes Hills.

The Los Angeles basin is a structural depression that has been the site of discontinuous deposition since the Late Cretaceous and of continuous subsidence and primarily marine deposition since the middle Miocene. This and other sedimentary basins formed during Miocene and Pliocene as a result of an early San Andreas-type phase of transform motion along the western margin of North America. At least three cycles of shallow marine transgression and regression created embayments and flood plains along the ancient coastline. During much of the middle Miocene a northwest-trending marine embayment covered the site of the Los Angeles basin. Rivers that drained the highlands to the north and east transported and deposited huge volumes of coarse-grained sandstone and sandy cobble-boulder conglomerate into the embayment.

Deposition continued until the end of the Pliocene, at which time the Palos Verdes Hills were an island and large parts of the Santa Monica Mountains, the Puente Hills, the Santa Ana Mountains, and much of the southwest portions of the basin were exposed. Then in the early Pleistocene, the Palos Verdes Hills and southwestern areas again subsided and marine deposition resumed (Yerkes et al., 1965).

According to geologic mapping by Dibblee (1989), the project area is immediately underlain by Quaternary alluvium of Holocene age, which is in turn underlain by the Puente Formation of Late Miocene age. These geologic units are discussed in more detail below.

PUENTE FORMATION

The Puente Formation is middle to upper Miocene (14 to 5 million years) in age, and was named in 1907 for its exposures in the Puente Hills. The Puente Formation within the southwestern block of the LA basin is composed of marine hard shale and fine to coarse-grained sandstone up to 4,100 feet in thickness (Yerkes, et al. 1965). The Puente Formation is isochronous (deposited at the same time) with the Monterey and Modelo Formations, but consists of more terrigenous sediments because of the basin's proximity to the continental borderlands. Critelli (1995) suggests that an intrabasinal bathymetric ridge probably separated these formations.

The Puente Formation is known to produce significant paleontological resources including invertebrates, sharks, fish, marine and terrestrial mammals, and some of the most complete collections of marine algae and terrestrial flora. It has been assigned a high paleontological sensitivity by Eisentraut and Cooper (2002).

QUATERNARY ALLUVIUM

Surficial Quaternary alluvium of Holocene age (less than 10,000 years before present [BP] to Recent) is present to an unknown depth within the project area. Alluvial sediments consist of unconsolidated gravel, sand, silt, and clay deposited in modern stream channels and fluvial slope wash. These young sediments may over lie “older alluvium” of Pleistocene age (1.8 million years ago [Ma] to 10,000 BP). Older alluvial sediments may be slightly to moderately consolidated but are generally only distinguishable through relative dating and stratigraphic position.

Holocene-aged deposits contain the remains of modern organisms and are too young to contain fossils. Therefore, they have no paleontological sensitivity. However, older alluvium is known to yield many fossilized land mammals, birds, reptiles, amphibians, and fishes. Fossilized invertebrates and plant remains have also been collected from this unit.

ANALYSIS AND RESULTS

RESOURCE ASSESSMENT SUMMARY

Geologic mapping by Dibblee (1989) was consulted to identify the specific geologic units underlying the project area. The following table summarizes these units and their known paleontological sensitivity ratings.

Table 1. Geologic Formations Underlying the Project Area

Geologic Formation	Age	Fossils	Paleontological Sensitivity Potential	Monitoring Recommendation
Alluvium/Gravel	Pleistocene to Holocene	Terrestrial Vertebrates	*Low to High	Part-time
Puente Formation	Late Miocene	Vertebrates, Invertebrates, Plants	High	Full-time

*Sensitivity increases with depth

MUSEUM RECORDS SEARCH AND LITERATURE REVIEW

The Vertebrate Paleontology section of the LACM performed a paleontological collections records search to locate fossil localities within and in the immediate vicinity of the project area. Museum records indicate that at least two vertebrate fossil localities yielding scientifically significant vertebrate specimens have been documented nearby the project area (McLeod, 2006). These fossil localities were discovered in Puente Formation of Late Miocene age. Numerous scientifically significant specimens were produced from these localities, including *Cyclothone* (fossil bristlemouth fish) and *Thyrsocles kreigeri* (fossil snake mackerel fish). No localities were reported from the Quaternary Alluvium. The museum records search results are summarized in Table 2.

Table 2. Museum Records Search Results for the Project

LACM Locality Number(s)	Geologic Formation	Age	Taxa
LACM 5961	Puente Formation	Late Miocene	Marine Vertebrates
LACM 7507	Puente Formation	Late Miocene	Marine Vertebrates

RECOMMENDED MITIGATION MEASURES

The destruction of fossils as a result of human-caused ground disturbance has a significant cumulative impact, as it makes biological records of ancient life permanently unavailable for study by scientists. Implementation of proper mitigation measures can, however, reduce the impacts to the paleontological resources to below the level of significance.

The following mitigation measures have been developed in accordance with the SVP (1995) standards and the City of Los Angeles guidelines and meet the paleontological requirements of CEQA and NEPA. These mitigation measures have been used throughout California and have been demonstrated to be successful in protecting paleontological resources while allowing timely completion of construction.

- A. All project-related ground disturbances that could potentially impact the Puente Formation will be monitored by a qualified paleontological monitor on a full-time basis, as this geologic unit is determined to have a high paleontological sensitivity. Project-related excavations that occur in surficial Quaternary alluvium deposits (less than 5 feet depth) will be monitored on a part-time basis to ensure that underlying paleontologically sensitive sediments are not being impacted.
- B. A qualified paleontologist will be retained to supervise monitoring of construction excavations and to produce a Paleontological Monitoring and Mitigation Plan for the proposed project. Paleontological resource monitoring will include inspection of exposed rock units during active excavations within sensitive geologic sediments. The monitor will have authority to temporarily divert grading away from exposed fossils in order to professionally and efficiently recover the fossil specimens and collect associated data. The qualified paleontologist will prepare monthly progress reports to be filed with the client and the lead agency.
- C. At each fossil locality, field data forms will be used to record pertinent geologic data, stratigraphic sections will be measured, and appropriate sediment samples will be collected and submitted for analysis.
- D. Matrix sampling would be conducted to test for the presence of microfossils. Testing for microfossils would consist of screen-washing small samples (approximately 200 pounds) to determine if significant fossils are present. If microfossils are present, additional matrix samples will be collected (up to a maximum of 6,000 pounds per locality to ensure recovery of a scientifically significant microfossil sample).
- E. Recovered fossils will be prepared to the point of curation, identified by qualified experts, listed in a database to facilitate analysis, and repositied in a designated paleontological curation facility. The most likely repository is the LACM.
- F. The qualified paleontologist will prepare a final monitoring and mitigation report to be filed with the client, the lead agency, and the repository.

REFERENCES

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APPENDIX E

Noise

Estimated dBA, CNEL /b/ -- AM PEAK HOUR

Roadway Segment	Existing	No Project	Project	Project Impact	Cumulative Impact
Alameda St Between US-101 and Cesar Chavez Ave	69.6	69.9	69.9	0.0	0.3
Alameda St Between Cesar Chavez Ave and Vignes St	69.2	69.7	69.7	0.0	0.5
Main St Between Vignes St and LeRoy St	68.0	68.5	68.5	0.0	0.5
Vignes St Between Cesar Chavez Ave and Ramirez St	67.2	67.3	67.4	0.1	0.2
Vignes St Between Cesar Chavez Ave and Main St	66.8	67.3	67.3	0.0	0.4

Estimated dBA, CNEL /b/ -- PM PEAK HOUR

Roadway Segment	Existing	No Project	Project	Project Impact	Cumulative Impact
Alameda St Between US-101 and Cesar Chavez Ave	69.7	70.0	70.1	0.0	0.4
Alameda St Between Cesar Chavez Ave and Vignes St	69.4	69.9	70.0	0.0	0.6
Main St Between Vignes St and LeRoy St	67.7	68.4	68.4	0.0	0.7
Vignes St Between Cesar Chavez Ave and Ramirez St	68.0	68.1	68.2	0.1	0.2
Vignes St Between Cesar Chavez Ave and Main St	67.8	68.2	68.3	0.1	0.5

MTA Union Station Bus Maintenance Operations Facility Project CNEL Noise Estimates - Based on AM Peak Hour

Existing Conditions

ROAD SEGMENT	from:	to:	TOT. # VEH.	EQUIVALENT LANE DISTANCE			VEHICLE TYPE %						VEHICLE SPEED					NOISE LEVEL (dBA)			50 ft ROW CNEL (dBA)	75 ft ROW CNEL (dBA)	100 ft ROW CNEL (dBA)	
				D1	D2	Eq. Dis.	Auto		MT		HT		Auto	k/h	MT	k/h	HT	k/h	Auto	MT				HT
							%	Auto	%	MT	%	HT												
Alameda	US-101	Cesar Chavez Ave	2034	6	78	22	91	1851	6	122	3	61	35	56	35	56	35	56	67.0	64.9	67.1	69.6	68.3	67.3
Alameda	Cesar Chavez Av	Vignes St	1844	6	78	22	91	1678	6	111	3	55.3	35	56	35	56	35	56	66.6	64.5	66.7	69.2	67.9	66.9
Main St	Vignes St	LeRoy St	1436	12	48	24	91	1307	6	86.2	3	43.1	35	56	35	56	35	56	65.5	63.4	65.6	68.0	66.7	65.7
Vignes St	Cesar Chavez Av	Ramirez St	1144	6	66	20	91	1041	6	68.6	3	34.3	35	56	35	56	35	56	64.5	62.4	64.6	67.2	65.9	64.9
Vignes St	Cesar Chavez Av	Main St	875	6	54	18	91	796.3	6	52.5	3	26.3	35	56	35	56	35	56	63.3	61.2	64.9	66.8	65.5	64.5

Future No Project Conditions

ROAD SEGMENT	from:	to:	TOT. # VEH.	EQUIVALENT LANE DISTANCE			VEHICLE TYPE %						VEHICLE SPEED					NOISE LEVEL (dBA)			50 ft ROW CNEL (dBA)	75 ft ROW CNEL (dBA)	100 ft ROW CNEL (dBA)	
				D1	D2	Eq. Dis.	Auto		MT		HT		Auto	k/h	MT	k/h	HT	k/h	Auto	MT				HT
							%	Auto	%	MT	%	HT												
Alameda	US-101	Cesar Chavez Ave	2167	6	78	22	91	1972	6	130	3	65	35	56	35	56	35	56	67.3	65.2	67.4	69.9	68.6	67.6
Alameda	Cesar Chavez Av	Vignes St	2053	6	78	22	91	1868	6	123	3	61.6	35	56	35	56	35	56	67.0	64.9	67.1	69.7	68.4	67.4
Main St	Vignes St	LeRoy St	1603	12	48	24	91	1459	6	96.2	3	48.1	35	56	35	56	35	56	65.9	63.9	66.1	68.5	67.2	66.2
Vignes St	Cesar Chavez Av	Ramirez St	1167	6	66	20	91	1062	6	70	3	35	35	56	35	56	35	56	64.6	62.5	64.7	67.3	66.0	65.0
Vignes St	Cesar Chavez Av	Main St	961.5	6	54	18	91	875	6	57.7	3	28.8	35	56	35	56	35	56	63.7	61.6	65.3	67.3	65.9	64.9

Future With Project Conditions

ROAD SEGMENT	from:	to:	TOT. # VEH.	EQUIVALENT LANE DISTANCE			VEHICLE TYPE %						VEHICLE SPEED					NOISE LEVEL (dBA)			50 ft ROW CNEL (dBA)	75 ft ROW CNEL (dBA)	100 ft ROW CNEL (dBA)	
				D1	D2	Eq. Dis.	Auto		MT		HT		Auto	k/h	MT	k/h	HT	k/h	Auto	MT				HT
							%	Auto	%	MT	%	HT												
Alameda	US-101	Cesar Chavez Ave	2179	6	78	22	91	1983	6	131	3	65.4	35	56	35	56	35	56	67.3	65.2	67.4	69.9	68.6	67.6
Alameda	Cesar Chavez Av	Vignes St	2055	6	78	22	91	1870	6	123	3	61.6	35	56	35	56	35	56	67.0	64.9	67.1	69.7	68.4	67.4
Main St	Vignes St	LeRoy St	1603	12	48	24	91	1459	6	96.2	3	48.1	35	56	35	56	35	56	65.9	63.9	66.1	68.5	67.2	66.2
Vignes St	Cesar Chavez Av	Ramirez St	1190	6	66	20	91	1083	6	71.4	3	35.7	35	56	35	56	35	56	64.7	62.6	64.8	67.4	66.1	65.1
Vignes St	Cesar Chavez Av	Main St	970.5	6	54	18	91	883.2	6	58.2	3	29.1	35	56	35	56	35	56	63.8	61.7	65.4	67.3	65.9	64.9

PM

Existing Conditions

ROAD SEGMENT	from: to:	TOT. # VEH.	EQUIVALENT LANE DISTANCE			VEHICLE TYPE %						VEHICLE SPEED					NOISE LEVEL (dBA)			50 ft ROW CNEL (dBA)	75 ft ROW CNEL (dBA)	100 ft ROW CNEL (dBA)	
			D1	D2	Eq. Dis.	Auto		MT		HT		Auto	k/h	MT	k/h	HT	k/h	Auto	MT				HT
						%	Auto	%	MT	%	HT												
Alameda	US-101 Cesar Chavez Ave	2060	6	78	22	91	1875	6	124	3	61.8	35	56	35	56	35	56	67.0	65.0	67.2	69.7	68.4	67.4
Alameda	Cesar Chavez Av Vignes St	1934	6	78	22	91	1759	6	116	3	58	35	56	35	56	35	56	66.8	64.7	66.9	69.4	68.1	67.1
Main St	Vignes St LeRoy St	1355	12	48	24	91	1233	6	81.3	3	40.7	35	56	35	56	35	56	65.2	63.1	65.3	67.7	66.5	65.5
Vignes St	Cesar Chavez Av Ramirez St	1364	6	66	20	91	1241	6	81.8	3	40.9	35	56	35	56	35	56	65.2	63.2	65.4	68.0	66.7	65.7
Vignes St	Cesar Chavez Av Main St	1082.5	6	54	18	91	985.1	6	65	3	32.5	35	56	35	56	35	56	64.2	62.2	65.9	67.8	66.4	65.4

Future No Project Conditions

ROAD SEGMENT	from: to:	TOT. # VEH.	EQUIVALENT LANE DISTANCE			VEHICLE TYPE %						VEHICLE SPEED					NOISE LEVEL (dBA)			50 ft ROW CNEL (dBA)	75 ft ROW CNEL (dBA)	100 ft ROW CNEL (dBA)	
			D1	D2	Eq. Dis.	Auto		MT		HT		Auto	k/h	MT	k/h	HT	k/h	Auto	MT				HT
						%	Auto	%	MT	%	HT												
Alameda	US-101 Cesar Chavez Ave	2230	6	78	22	91	2029	6	134	3	66.9	35	56	35	56	35	56	67.4	65.3	67.5	70.0	68.7	67.7
Alameda	Cesar Chavez Av Vignes St	2206	6	78	22	91	2007	6	132	3	66.2	35	56	34	54	35	56	67.3	65.1	67.5	69.9	68.6	67.6
Main St	Vignes St LeRoy St	1588	12	48	24	91	1445	6	95.3	3	47.6	35	56	35	56	35	56	65.9	63.8	66.0	68.4	67.2	66.2
Vignes St	Cesar Chavez Av Ramirez St	1391	6	66	20	91	1266	6	83.5	3	41.7	35	56	35	56	35	56	65.3	63.2	65.4	68.1	66.8	65.8
Vignes St	Cesar Chavez Av Main St	1207	6	54	18	91	1098	6	72.4	3	36.2	35	56	35	56	35	56	64.7	62.6	66.3	68.2	66.9	65.8

Future With Project Conditions

ROAD SEGMENT	from: to:	TOT. # VEH.	EQUIVALENT LANE DISTANCE			VEHICLE TYPE %						VEHICLE SPEED					NOISE LEVEL (dBA)			50 ft ROW CNEL (dBA)	75 ft ROW CNEL (dBA)	100 ft ROW CNEL (dBA)	
			D1	D2	Eq. Dis.	Auto		MT		HT		Auto	k/h	MT	k/h	HT	k/h	Auto	MT				HT
						%	Auto	%	MT	%	HT												
Alameda	US-101 Cesar Chavez Ave	2253	6	78	22	91	2050	6	135	3	67.6	35	56	35	56	35	56	67.4	65.3	67.5	70.1	68.8	67.8
Alameda	Cesar Chavez Av Vignes St	2206	6	78	22	91	2007	6	132	3	66.2	35	56	35	56	35	56	67.3	65.3	67.5	70.0	68.7	67.7
Main St	Vignes St LeRoy St	1588	12	48	24	91	1445	6	95.3	3	47.6	35	56	35	56	35	56	65.9	63.8	66.0	68.4	67.2	66.2
Vignes St	Cesar Chavez Av Ramirez St	1416	6	66	20	91	1289	6	85	3	42.5	35	56	35	56	35	56	65.4	63.3	65.5	68.2	66.8	65.8
Vignes St	Cesar Chavez Av Main St	1225	6	54	18	91	1115	6	73.5	3	36.8	35	56	35	56	35	56	64.8	62.7	66.4	68.3	66.9	65.9