

Attachment 1

Submitted by:



WILSHIRE-LA CIENEGA STATION DETOUR
Traffic Analysis
Final Report

Submitted to:
City of Beverly Hills

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1.0 INTRODUCTION

The Metro Purple Line Extension Project to Westwood has started construction activities for Section I, from the Wilshire/Western station to Wilshire Boulevard/La Cienega Boulevard. During subway construction, full and partial street closures will be necessary on weekdays and weekends, which in turn would result in diverted traffic to adjacent streets. The City of Beverly Hills has requested a construction traffic analysis of the different construction stages for the new station at Wilshire Boulevard/La Cienega Boulevard.

The purpose of this analysis is to assess the potential effects of traffic diversion, off Wilshire Boulevard during construction periods, onto arterial streets and local roads in the vicinity of the construction area. This report provides key traffic information regarding existing traffic volumes, an analysis of impacts at study intersections, a determination of intersection Levels of Service (LOS), and recommendations to help alleviate impacts and facilitate the movement of diverted traffic within the area.

1.1 PROJECT DESCRIPTION

The project consists of multiple construction phases that would affect Wilshire Boulevard between La Cienega Boulevard on the west and San Vicente Boulevard on the east. Based on coordination with the City of Beverly Hills, the following two scenarios are assessed in this report:

- **Scenario 1:** All Wilshire Boulevard lanes are closed during consecutive weekdays and weekends for approximately six weeks for end pile installation/decking;
- **Scenario 2:** All Wilshire Boulevard lanes are closed during weekends only for approximately 15 weekends for deck installation. Weekend closures would begin at 9 p.m. on Friday and end at 6 a.m. on Monday.

1.2 STUDY AREA

The project study area contains the southeastern portion of the City of Beverly Hills as well as portions of the City of Los Angeles. Aside from Wilshire Boulevard, major east-west roadways within the area are Olympic Boulevard, Pico Boulevard, Burton Way, and 3rd Street. Major north-south roadways in the area are Robertson Boulevard, La Cienega Boulevard, San Vicente Boulevard, Crescent Heights Boulevard, and Fairfax Avenue. The following nine (9) intersections were selected for analysis, representing locations that may potentially be impacted by diverted traffic:

1. Robertson Boulevard/Clifton Way;
2. Robertson Boulevard/Wilshire Boulevard;
3. Robertson Boulevard/Gregory Way;
4. La Cienega Boulevard/Clifton Way;
5. La Cienega Boulevard/Wilshire Boulevard;
6. La Cienega Boulevard/Gregory Way;
7. San Vicente Boulevard/Wilshire Boulevard;
8. Crescent Heights Boulevard/3rd Street; and
9. Crescent Heights Boulevard/Olympic Boulevard.

Figure 1 shows the proposed intersections to be analyzed in existing and construction conditions.

2.0 ENVIRONMENTAL SETTING

This section presents an overview of the existing roadway and transit system within the study area, and the methodology used to determine existing traffic volumes.

2.1 ROADWAY CONFIGURATIONS

The construction closure network includes Clifton Way, La Cienega Boulevard, Wilshire Boulevard, San Vicente Boulevard, Gregory Way, Crescent Heights Boulevard, and Olympic Boulevard. Below are descriptions of the existing characteristics of each of these roadways.

Clifton Way, oriented in an east-west direction, consists of a two-lane undivided local roadway terminating at San Vicente Boulevard on the east end. On-street parking is restricted during peak hours along Clifton Way.

La Cienega Boulevard, oriented in a north-south direction, is a six-lane divided roadway providing regional access through its connection to the I-10 freeway. La Cienega Boulevard intersects with the west end of the closure. On-street parking is prohibited during peak hours along La Cienega Boulevard in the study area.

Wilshire Boulevard, oriented in an east-west direction, is a six-lane divided roadway providing regional access through its connection to the I-405 freeway. Wilshire Boulevard is the location of the construction closure. On-street parking is prohibited during peak hours along Wilshire Boulevard. East of San Vicente Boulevard, within the City of Los Angeles, Wilshire Boulevard includes one Bus-only curb lane in each direction, restricted to buses and right-turning vehicles during peak periods.

San Vicente Boulevard, oriented in a skewed north-south direction, is a six-lane divided roadway terminating at Sunset Boulevard on the north end. San Vicente Boulevard intersects with the east end of the closure. On-street parking is allowed during peak hours along San Vicente Boulevard.

Robertson Boulevard, oriented in a north-south direction, consists of a four-lane undivided roadway terminating at the I-10 freeway on the south end. On-street parking is allowed during peak hours along Robertson Boulevard.

Gregory Way, oriented in an east-west direction, is a two-lane undivided local roadway terminating at Schumacher Drive on the east end. On-street parking is allowed during peak hours along Gregory Way.



FIGURE 1
Project Location and Study Intersections

City of Beverly Hills
Wilshire-La Cienega Station
Detour Traffic Analysis



Crescent Heights Boulevard/McCarthy Vista, oriented in a north-south direction, is a four-lane undivided roadway north of Olympic Boulevard. South of Olympic Boulevard, *Crescent Heights Boulevard* transitions to a two-lane undivided roadway. On-street parking is provided, but restricted during peak hours along north of Wilshire Boulevard.

Olympic Boulevard, oriented in an east-west direction, is a six-lane divided roadway providing regional access through its connection to the I-405 freeway. On-street parking is restricted during peak hours along Olympic Boulevard.

2.2 EXISTING PUBLIC TRANSIT

The study area is served by transit lines that will be affected by the construction closure.

Metro Lines:

Line 20 – This line operates between downtown Los Angeles and Santa Monica. The line travels east and west along Wilshire Boulevard. Service is provided at ten minute headways during peak periods on weekdays. Weekends and holiday service is also provided.

Line 720 (Rapid) – This line operates between Commerce and Santa Monica. Within the study area, the line travels east and west along Wilshire Boulevard. Service is provided at five minute headways during peak periods on weekdays. Weekends and holiday service is also provided.

2.3 EXISTING TRAFFIC VOLUMES

Existing peak period traffic count data was collected in August, September, and October 2015, as well as obtained from the City of Beverly Hills and City of Los Angeles. Traffic count data for both weekday and Saturday conditions are used in this analysis to assess the impact of the construction in each condition. The traffic impact analysis is based on the highest single hour of traffic during each time period at each location. Detailed vehicle turning movement data are included in **Appendix A**. Through the proposed construction area, Wilshire Boulevard currently carries the following peak hour volumes, which will be used as part of the analysis to estimate the magnitude of traffic impacts of diverted traffic around the study area:

- Weekday a.m. peak hour
 - Eastbound Wilshire Boulevard: 1,157 vehicles per hour
 - Westbound Wilshire Boulevard: 1,932 vehicles per hour
- Weekday p.m. peak hour
 - Eastbound Wilshire Boulevard: 1,507 vehicles per hour
 - Westbound Wilshire Boulevard: 1,190 vehicles per hour
- Saturday mid-day peak hour
 - Eastbound Wilshire Boulevard: 1,148 vehicles per hour
 - Westbound Wilshire Boulevard: 907 vehicles per hour

As shown, the westbound direction of Wilshire Boulevard carries the larger directional volume than the eastbound direction in the a.m. peak hour on weekdays. During the p.m. peak hour, the eastbound direction carries the higher volume. During traffic count collection, construction activities along Wilshire Boulevard related to utility relocation were occurring on weekends, resulting in a full eastbound closure and partial westbound closure of the roadway segment. Thus, collecting Saturday traffic counts at the La Cienega Boulevard and San Vicente Boulevard intersections along Wilshire Boulevard was not feasible. Saturday volumes along this segment were estimated based on a ratio of the weekday volumes at other intersections to the traffic counts collected during Saturday conditions at those same intersections.

3.0 TRAFFIC OPERATIONS ANALYSIS METHODOLOGY

The quality of traffic operations is characterized using the concept of level of service (LOS). Level of service is defined by a range of grades from A (best) to F (worst). At intersections, LOS "A" represents relatively free operating conditions with little or no delay. LOS "F" is characterized by extremely unstable flow conditions and severe congestion with volumes at or near the intersection's design capacity. This results in long queues backing up from all approaches to intersections.

For the purposes of this report, analysis of traffic operations was conducted using the Intersection Capacity Utilization (ICU) method which measures LOS based on a Volume-to-Capacity (V/C) ratio developed using Traffix software. **Table 1** presents a brief description of each level of service letter grade, as well as the range of volume to capacity ratios associated with each grade for signalized intersections.

TABLE 1: INTERSECTION LEVEL OF SERVICE DEFINITIONS

Level of Service	Description	Intersection Volume to Capacity (V/C) Ratio
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
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.	>0.600-0.700
C	Good operation. Occasionally drivers may have to wait more than 60 seconds, and back-ups may develop behind turning vehicles. Most drivers feel somewhat restricted.	>0.700-0.800
D	Fair operation. Cars are sometimes required to wait more than 60 seconds during short peaks. There are no long-standing traffic queues.	>0.800-0.900
E	Poor operation. Some long-standing vehicular queues develop on critical approaches to intersections. Delays may be up to several minutes.	>0.900-1.000
F	Forced flow. Represents jammed conditions. Backups form locations downstream or on the cross street may restrict or prevent movement of vehicles out of the intersection approach lanes; therefore, volumes carried are not predictable. Potential for stop and go type traffic flow.	> 1.000

3.1 TRAVEL DEMAND MODEL REFINEMENT

Traffic volume forecasts were prepared through the use of the 2012 Southern California Association of Governments (SCAG) Regional Transportation model. The model was used as a baseline for obtaining general traffic diversion patterns within the study area during the construction closure conditions. The existing 2012 year model was enhanced to include additional local streets, which are anticipated to be used as diversion routes. The trip tables for each of the closure scenarios were identical, and were obtained from the SCAG regional model run (for 2012).

As a baseline condition, figures showing the a.m. and p.m. peak period model volumes in the study area with Wilshire Boulevard operating per existing conditions are provided in **Appendix C**. The a.m. volumes constitute a three-hour peak period and the p.m. volumes constitute a four-hour peak period.

4.0 EXISTING TRAFFIC CONDITIONS

A level of service analysis was conducted to evaluate existing intersection operations during the weekday a.m. and p.m. peak hours and during the Saturday mid-day peak hour at the nine study intersections. **Table 2** summarizes the existing weekday LOS at the study intersections. LOS calculations sheets are provided in **Appendix B**.

TABLE 2: EXISTING WEEKDAY INTERSECTION PEAK HOUR LEVEL OF SERVICE

Intersection		Traffic Control	AM Peak Hour		PM Peak Hour	
			V/C	LOS	V/C	LOS
1	Robertson Blvd /Clifton Wy	Signalized	0.474	A	0.513	A
2	Robertson Blvd /Wilshire Blvd	Signalized	0.955	E	1.002	F
3	Robertson Blvd /Gregory Wy	Signalized	0.566	A	0.412	A
4	La Cienega Blvd /Clifton Wy	Signalized	0.490	A	0.672	B
5	La Cienega Blvd /Wilshire Blvd	Signalized	0.975	E	1.041	F
6	La Cienega Blvd /Gregory Wy	Signalized	0.675	B	0.635	B
7	San Vicente Blvd /Wilshire Blvd	Signalized	1.122	F	0.929	E
8	Crescent Heights Blvd /3rd St	Signalized	0.852	D	0.769	C
9	Crescent Heights Blvd /Olympic Blvd	Signalized	0.909	E	0.862	D

Notes:

LOS = Level of Service.

As shown in **Table 2**, four of the study intersections are currently operating at LOS E or worse during weekday peak hour conditions. Three of these intersections are located along Wilshire Boulevard, and the fourth is located along Olympic Boulevard at Crescent Heights Boulevard.

Table 3 summarizes the Saturday LOS at the study intersections. LOS calculations sheets are provided in **Appendix B**.

TABLE 3: EXISTING SATURDAY INTERSECTION PEAK HOUR LEVEL OF SERVICE

Intersection		Traffic Control	Mid-day Peak Hour	
			V/C	LOS
1	Robertson Blvd /Clifton Wy	Signalized	0.346	A
2	Robertson Blvd /Wilshire Blvd	Signalized	0.724	C
3	Robertson Blvd /Gregory Wy	Signalized	0.363	A
4	La Cienega Blvd /Clifton Wy	Signalized	0.599	A
5	La Cienega Blvd /Wilshire Blvd ¹	Signalized	0.810	D
6	La Cienega Blvd /Gregory Wy	Signalized	0.551	A
7	San Vicente Blvd /Wilshire Blvd ¹	Signalized	0.737	C
8	Crescent Heights Blvd /3rd St	Signalized	0.659	B
9	Crescent Heights Blvd /Olympic Blvd	Signalized	0.576	A

¹ = Existing Saturday counts were collected during weekend full construction closure of EB Wilshire and partial construction closure of WB Wilshire between La Cienega Boulevard and San Vicente Boulevard. As a result, Saturday volumes at these intersections were estimated based on a ratio of Weekday p.m. counts to Saturday mid-day counts at the other intersections.

LOS = Level of Service.

As shown in **Table 3**, the nine study intersections are currently operating at LOS D or better during Saturday mid-day peak hour conditions. It is generally understood that traffic volumes during an hour on a Saturday are lower than volumes during a peak Weekday hour. This is due to less commuting trips occurring on a Saturday and a more dispersed hourly traffic pattern, as opposed to a Weekday where traffic is more consolidated to the morning and evening peak hours.

5.0 TRAFFIC CONDITIONS DURING CONSTRUCTION

This section assesses the traffic conditions in the study area likely to occur during the construction scenarios. First, traffic modeling results are presented to illustrate the likely routes that traffic would divert to when not considering any mitigation measures taken to encourage one route over another. Second, the intersection LOS results with the diverted traffic are presented.

5.1 TRAFFIC MODEL RESULTS

Upon restricting the traffic movements along Wilshire Boulevard between La Cienega Boulevard and San Vicente Boulevard, the traffic model was re-run to estimate the magnitude and distribution of traffic diversion within the study area. Figures showing the a.m. and p.m. peak period results for this model run are provided in **Appendix C**. The volume patterns shown do not consider any mitigation measures that would be implemented. Rather, this scenario represents a “snapshot” of likely conditions if no measures were taken to guide motorists to detour routes. As shown in the figures, a green link represents a roadway link with an overall decrease in volumes during construction conditions versus existing conditions. An orange link represents a roadway link with an overall increase in traffic volumes during construction conditions versus existing conditions.

Upon comparing the volumes from the existing and full Wilshire Boulevard closure model run data, the following key observations on the likelihood of traffic volume increases can be made:

- AM Peak Period
 - Northbound San Vicente volume, north of Wilshire Boulevard, could increase by approximately 35-40%.
 - Southbound La Cienega Boulevard volume, north of Wilshire Boulevard, could increase by approximately 10-15%.
 - Northbound La Cienega Boulevard volume, south of Wilshire Boulevard, could increase by approximately 15-20%.
 - Westbound Olympic Boulevard volume, west of Fairfax Avenue, could increase by approximately 15-20%.
 - Southwest-bound Schumacher Drive volume, south of San Vicente Boulevard, could increase significantly (more than triple) due to northbound San Vicente u-turning volume at Wilshire Boulevard.
 - Westbound Gregory Way volume, east of La Cienega Boulevard, could increase significantly (more than triple) due to diverting traffic using southwest-bound Schumacher Drive.

- PM Peak Period
 - Southbound La Cienega Boulevard volume, south of Wilshire Boulevard, could increase by approximately 15-20%.
 - Southbound San Vicente volume, north of Wilshire Boulevard, could increase by approximately 20-25%.

- Eastbound Olympic Boulevard volume, east of La Cienega Boulevard, could increase by approximately 20-25%.
- Eastbound Gregory Way volume, east of La Cienega Boulevard, could increase significantly (more than triple) due to diverting traffic from La Cienega Boulevard.
- Southbound Le Doux Road, south of Wilshire Boulevard, could increase significantly (more than double).

A “screenline” comparison of model volumes along major east-west streets, located north and south of Wilshire Boulevard, was prepared in order to estimate the magnitude of traffic that is likely to avoid the study area completely. The comparison, shown in **Table 4**, focused on the two peak directional movements along Wilshire Boulevard during typical weekday conditions. These are the westbound movement in the a.m. peak period and the eastbound movement in the p.m. peak period. The northern boundary was considered to be Beverly Boulevard and the southern boundary was considered to be Pico Boulevard.

TABLE 4: SCREENLINE COMPARISON – PEAK WEEKDAY CONDITIONS

Segment		Peak Period Model Volume			Percentage of trips avoiding area
		Existing	With Full Closure	Change in Volume	
Westbound Direction – AM Peak Period					
Beverly Blvd	btwn Crescent Heights & Fairfax	4,464	4,413	-51	0.09%
3rd St	btwn Crescent Heights & Fairfax	3,458	3,389	-69	
6th St	btwn Crescent Heights & Fairfax	1,843	1,832	-11	
Wilshire Blvd	btwn Crescent Heights & Fairfax	4,032	3,850	-182	
San Vicente Blvd	btwn Crescent Heights & Fairfax	8,394	7,677	-717	
Olympic Blvd	btwn Crescent Heights & Fairfax	5,110	5,996	886	
Pico Blvd	btwn Crescent Heights & Fairfax	3,427	3,544	117	
Total		30,728	30,701	-27	
Eastbound Direction – PM Peak Period					
Beverly Blvd	btwn Robertson & San Vicente	4,439	4,487	48	1.68%
3rd St	btwn Robertson & San Vicente	2,446	2,564	118	
Burton Wy	btwn Robertson & San Vicente	7,623	8,279	656	
Clifton Wy	btwn Robertson & Le Doux	1,379	1,645	266	
Wilshire Blvd	btwn Robertson & Le Doux	8,679	6,835	-1,844	
Gregory Wy	btwn Robertson & Le Doux	1,434	1,394	-40	
Olympic Blvd	btwn Robertson & Le Doux	10,048	10,104	56	
Pico Blvd	btwn Robertson & Le Doux	5,433	5,478	45	
Total		41,481	40,786	-695	

As shown in **Table 4**, only a small percentage of trips would reasonably be expected to avoid the area, whereas the rest would divert to roadways within the study area resulting in traffic impacts.

It should be noted that the travel demand model used for the detour analysis is the SCAG 2012 Regional travel demand model, which has some limitations for analysis. The travel demand model does not include intersection signals, which does not allow for additional delay added to trips at red lights. Additionally, trips are loaded onto the network by centroid connections, which are intended to reflect the general connection of a geographic area of local streets and parking lots onto the collector and arterial network. Often times, not all of the driveways or connections into neighborhoods can be reflected within the modeled network.

Given the nature of the travel demand model, and the desire for any trip to be the shortest path (by a combination of length and cost), it is difficult to get an accurate volume on local streets, since their low speed (25 mph or less) makes them unattractive to vehicle trips.

5.2 INTERSECTION LEVEL OF SERVICE

Based on the traffic model runs, the percent trip distribution of Wilshire Boulevard traffic that would divert around the construction area was estimated. **Figures 2 and 3** show the estimated eastbound and westbound distribution percentages, respectively, of current Wilshire Boulevard traffic that would no longer be able to use the segment between La Cienega Boulevard and San Vicente Boulevard.

Using the trip distribution estimates shown in **Figures 2 and 3**, a level of service analysis was conducted to evaluate traffic operations assuming full closure of Wilshire Boulevard, during the weekday a.m. and p.m. peak hours and during the Saturday mid-day peak hour at the nine study intersections. **Table 5** summarizes the weekday LOS at the study intersections assuming the full closure of Wilshire Boulevard. LOS calculations sheets are provided in **Appendix B**.

TABLE 5: TRAFFIC DURING CONSTRUCTION
WEEKDAY INTERSECTION PEAK HOUR LEVEL OF SERVICE

Intersection		Traffic Control	AM Peak Hour		PM Peak Hour	
			V/C	LOS	V/C	LOS
1	Robertson Blvd /Clifton Wy	Signalized	0.663	A	0.604	B
2	Robertson Blvd /Wilshire Blvd	Signalized	1.248	F	1.090	F
3	Robertson Blvd /Gregory Wy	Signalized	0.726	C	0.560	A
4	La Cienega Blvd /Clifton Wy	Signalized	0.708	C	0.915	E
5	La Cienega Blvd /Wilshire Blvd ¹	Signalized	1.162	F	1.002	F
6	La Cienega Blvd /Gregory Wy	Signalized	0.899	D	0.759	C
7	San Vicente Blvd /Wilshire Blvd ¹	Signalized	1.264	F	1.116	F
8	Crescent Heights Blvd /3rd St	Signalized	0.916	E	0.769	C
9	Crescent Heights Blvd /Olympic Blvd	Signalized	0.972	E	0.958	E

1 = East leg of intersection closed for construction with this scenario.

2 = West leg of intersection closed for construction with this scenario.

Notes:

LOS = Level of Service.

As shown in **Table 5**, with traffic diverting throughout the study area due to the full construction closure along Wilshire Boulevard, nearly all of the study intersections are expected to experience degraded V/C ratios and, in some cases, degraded LOS during weekday peak hour conditions. Specifically, the La Cienega Boulevard/Clifton Way intersection is forecast to worsen from a LOS B to LOS E in the p.m. peak hour and the Crescent Heights/Olympic Boulevard intersection is forecast to worsen from LOS D to E in the p.m. peak hour.

Table 6 summarizes the Saturday LOS at the study intersections. LOS calculations sheets are provided in **Appendix B**.

TABLE 6: TRAFFIC DURING CONSTRUCTION
SATURDAY INTERSECTION PEAK HOUR LEVEL OF SERVICE

Intersection		Traffic Control	Mid-day Peak Hour	
			V/C	LOS
1	Robertson Blvd /Clifton Wy	Signalized	0.434	A
2	Robertson Blvd /Wilshire Blvd	Signalized	0.837	D
3	Robertson Blvd /Gregory Wy	Signalized	0.478	A
4	La Cienega Blvd /Clifton Wy	Signalized	0.827	D
5	La Cienega Blvd /Wilshire Blvd	Signalized	0.744	C
6	La Cienega Blvd /Gregory Wy	Signalized	0.658	B
7	San Vicente Blvd /Wilshire Blvd	Signalized	0.891	D
8	Crescent Heights Blvd /3rd St	Signalized	0.659	B
9	Crescent Heights Blvd /Olympic Blvd	Signalized	0.644	B

1 = East leg of intersection closed for construction with this scenario.
 2 = West leg of intersection closed for construction with this scenario.
 Notes:
 LOS = Level of Service.

As shown in **Table 6**, with traffic diverting throughout the study area due to the full construction closure along Wilshire Boulevard, the study intersections are forecast to continue to operate at LOS D or better during Saturday mid-day peak hour conditions.

During September of 2015, eastbound Wilshire Boulevard was closed between La Cienega Boulevard and San Vicente Boulevard during consecutive weekends for utility relocation. At the same time, westbound Wilshire Boulevard was reduced to one lane of traffic. Iteris staff observed traffic patterns during consecutive Saturday afternoons, when traffic was near peak levels for the day. The patterns revealed that traffic queues and delays were not extensive in the vicinity of the La Cienega/Wilshire Boulevard intersection due mostly to lower traffic volume levels on Saturdays compared to weekdays and due to the utilization of Changeable Message Signs located along Wilshire Boulevard. Thus, the observed findings are consistent with the analysis findings shown in **Table 6**.

6.0 TRAFFIC CONDITIONS DURING CONSTRUCTION WITH MITIGATION

This section presents a menu of potential mitigation measure recommendations to implement in order to alleviate some of the expected traffic impacts. In addition, traffic conditions are assessed with the draft mitigation measures assumed to be in place during construction conditions.

6.1 MITIGATION MEASURES

Utilizing the model run data described in the previous section and input from City of Beverly Hills and Metro staff, potential detour routes were prepared. These are routes that the City would want to encourage the public to utilize for the purposes of limiting traffic on local residential streets. The potential routes are shown in **Figure 4**.

In order to best achieve traffic flow along these routes, a set of mitigation measures were developed to facilitate the flow of diverted traffic during construction conditions. **Table 7** summarizes the mitigation measures and identifies whether a measure is appropriate for the consecutive weekday/weekend closure or for the weekend closure only. It is recognized that the draft mitigation measures, while beneficial to the flow of diverted traffic, could result in secondary impacts to other traffic movements. As such, these secondary impacts are noted in the table.



TABLE 7: POTENTIAL MITIGATION MEASURES

Location	Potential Measure	Appropriate for Weekday/Weekend (Scenario 1)	Appropriate for Weekends only (Scenario 2)	Secondary Impact
La Cienega Blvd (Clifton to Olympic)	Enforce on-street parking restrictions throughout the day (7:00 am – 7:00 pm)	X		Loss of 87 parking spaces (metered) in City of Beverly Hills
Clifton Wy (La Cienega to San Vicente)	Remove on-street parking to re-stripe to 2 EB lanes and 1 WB lane	X		Loss of 8 parking spaces (metered) in City of Beverly Hills
San Vicente Blvd/Clifton Wy	Add a temporary signal to facilitate NB left-turns from San Vicente to Clifton. NB San Vicente through movement would be unaffected.	X		Delay to South-Eastbound San Vicente traffic
La Cienega Blvd/Clifton Wy	Add a barricade preventing WB traffic from going through into the neighborhood	X	X	Residents would lose WB access to neighborhood from Clifton, though alternate routes would be available
La Cienega Blvd/ Wilshire Blvd	Re-stripe EB to provide 2 left-turn and 2 right-turn lanes Convert #3 SB lane to a right-turn lane (can be made into a “free” right using barriers). Convert SB left-turn lane to the #1 through lane (to maintain 3 through lanes) and taper/veer traffic west through intersection Adjust NB left-turn signal timing	X		Loss of pedestrian crosswalks at “free” right location, unless TCO used
San Vicente/Olympic Blvd	Increase the green time for NB left-turn movement	X	X	SB San Vicente will experience additional delay
San Vicente Blvd/ Wilshire Blvd	Restrict NB San Vicente to SB San Vicente U-turn movement	X	X	NB San Vicente will experience additional demand

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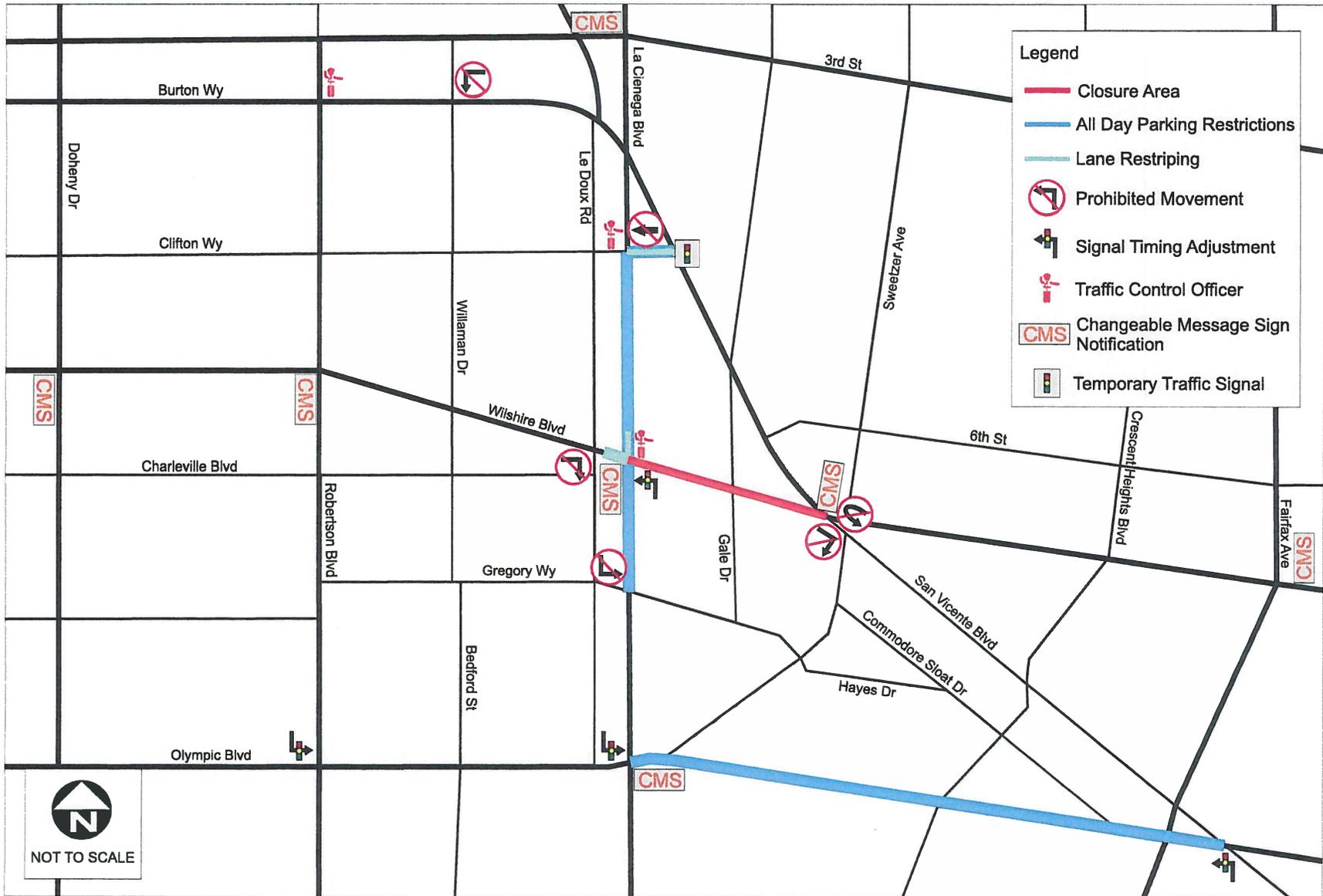
Location	Potential Measure	Appropriate for Weekday/Weekend (Scenario 1)	Appropriate for Weekends only (Scenario 2)	Secondary Impact
Olympic Blvd (La Cienega Blvd to San Vicente Blvd)	<p>Enforce on-street parking restrictions throughout the day (7:00 am – 7:00 pm). Parking restrictions could potentially be enforced in one direction only during the morning period, for example, and in the opposite direction during the afternoon period.</p> <p>While this mitigation measure can provide a benefit to traffic flow during non-peak hours, LADOT has acknowledged that not implementing this measure would not be a fatal flaw to the project.</p>	X		<p>Loss of approximately 78 parking spaces on south side (non-metered) in City of Los Angeles</p> <p>Loss of approximately 81 parking spaces on north side (non-metered) in City of Los Angeles</p>
La Cienega Blvd/ Gregory Wy	Prohibit SB left-turn movement	X	X	SB Left-turn at Olympic will experience heavy demand as a result
EB Wilshire Blvd at Doheny EB Wilshire Blvd at Robertson EB Wilshire Blvd at La Cienega WB Wilshire Blvd at La Brea WB Wilshire Blvd at Fairfax WB Wilshire Blvd at San Vicente NB La Cienega Blvd at Pico NB La Cienega Blvd at Olympic SB La Cienega Blvd at 3 rd St	Add Changeable Message Signs to inform motorists of a closure ahead and notify them towards potential detour routes.	X	X	None

It is recommended that the mitigation measures shown in **Table 7** be implemented at the onset of the construction period and continue through the duration of construction. In addition to those measures, contingency measures can be implemented if, during the first week of construction for example, detour routes are not actually operating the way they are intended to and local streets are experiencing heavy cut-through traffic. These contingency measures are summarized in **Table 8**. **Figure 5** shows the locations of all of the proposed mitigation measures within the study area.

TABLE 8: POTENTIAL CONTINGENCY MITIGATION MEASURES

Location	Potential Measure	Appropriate for Weekday/Weekend (Scenario 1)	Appropriate for Weekends only (Scenario 2)	Secondary Impact
La Cienega Blvd/ Clifton Wy La Cienega Blvd/ Wilshire Blvd Robertson Blvd/ Burton Wy	Place Traffic Control Officers (TCO's) at intersections to direct the flow of traffic and clear intersections during peak periods	X	X	None
Le Doux Rd/ Wilshire Blvd	Add barrier to prevent EB right-turns onto Le Doux	X	X	EB traffic may use other local roads
Willaman Dr/ Burton Wy	Prohibit WB left-turn movement. Alternate route for neighborhood residents can be NB San Vicente to WB Third to SB Willaman	X	X	WB Left-turn at Robertson will experience heavy demand as a result
Olympic Blvd/ Robertson Blvd	Monitor the need to lengthen the SB left-turn phase green time.	X	X	NB Robertson will experience additional delay
Schumacher Dr/ San Vicente Blvd	Add barrier to prevent SB right turns from San Vicente Blvd to Schumacher Dr	X	X	SB Crescent Height Blvd and WB Olympic Blvd will experience heavier demand as a result

As previously mentioned, multiple bus lines run along Wilshire Boulevard through the project construction area. The full closure of Wilshire Boulevard would cause impacts in terms of overall travel time and headways with buses re-routed around the closure area. It is expected that eastbound bus lines be diverted south on La Cienega Boulevard, to Olympic Boulevard, to Fairfax Avenue, and back up to Wilshire Boulevard. It is expected that westbound bus lines would be diverted along the same route, south on Fairfax Avenue, to Olympic Boulevard, to La Cienega Boulevard, and back up to Wilshire Boulevard. These routes are consistent with Metro's recently completed weekend bus diversion routes as a result of the utility relocation construction. During weekday conditions, the effects to public transit would be more significant as weekday ridership is typically higher than weekend ridership, thus additional person-delay would be experienced.



6.2 TRAFFIC MODEL RESULTS

The traffic model was re-run to estimate the change in the distribution of traffic diversion within the study area with the implementation of all of the potential mitigation measures, including the contingency measures. Figures showing the weekday a.m. and p.m. peak period model output results, with the potential mitigation measures implemented, are provided in **Appendix C**.

6.3 INTERSECTION LEVEL OF SERVICE

Based on the traffic model runs, the percent trip distribution of Wilshire Boulevard traffic that would divert around the construction area was estimated. **Figures 6 and 7** show the estimated eastbound and westbound distribution percentages with the recommended mitigation measures in place, respectively, of current Wilshire Boulevard traffic that would no longer be able to use the segment between La Cienega Boulevard and San Vicente Boulevard.

Using the trip distribution estimates shown in **Figures 6 and 7**, a level of service analysis was conducted to evaluate traffic operations assuming full closure of Wilshire Boulevard with mitigation measures in place, during the weekday a.m. and p.m. peak hours and during the Saturday mid-day peak hour at the nine study intersections. **Table 9** summarizes the weekday LOS at the study intersections. LOS calculations sheets are provided in **Appendix B**.

**TABLE 9: TRAFFIC DURING CONSTRUCTION WITH MITIGATION
 WEEKDAY INTERSECTION PEAK HOUR LEVEL OF SERVICE**

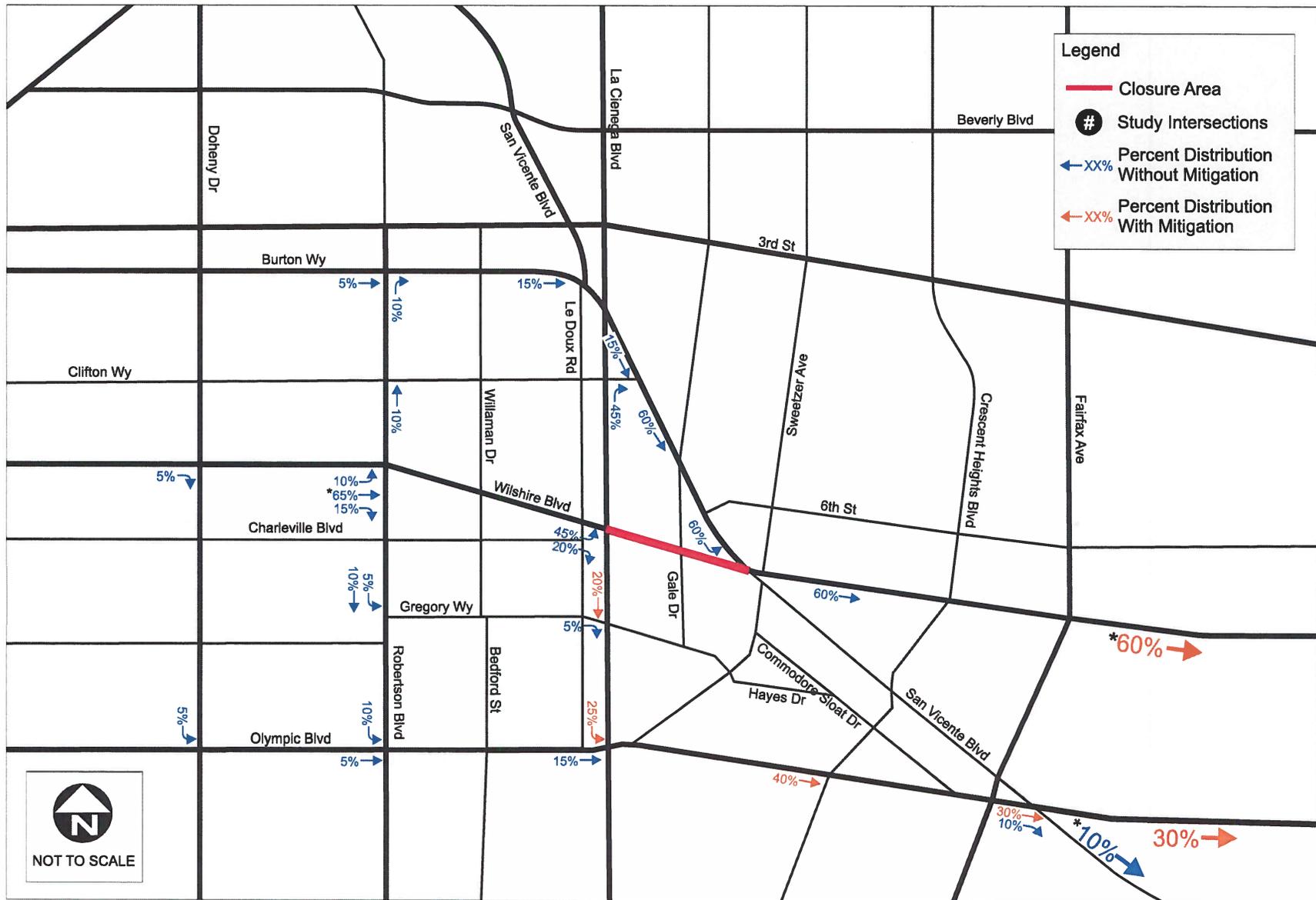
Intersection		Traffic Control	AM Peak Hour		PM Peak Hour	
			V/C	LOS	V/C	LOS
1	Robertson Blvd /Clifton Wy	Signalized	0.599	A	0.576	A
2	Robertson Blvd /Wilshire Blvd	Signalized	1.217	F	1.071	F
3	Robertson Blvd /Gregory Wy	Signalized	0.665	B	0.523	A
4	La Cienega Blvd /Clifton Wy	Signalized	0.963	E	1.107	F
5	La Cienega Blvd /Wilshire Blvd ¹	Signalized	0.957	E	0.885	D
6	La Cienega Blvd /Gregory Wy	Signalized	0.766	C	0.747	C
7	San Vicente Blvd /Wilshire Blvd ¹	Signalized	1.357	F	1.174	F
8	Crescent Heights Blvd /3rd St	Signalized	0.916	E	0.769	C
9	Crescent Heights Blvd /Olympic Blvd	Signalized	0.972	E	0.990	E

1 = East leg of intersection closed for construction with this scenario.

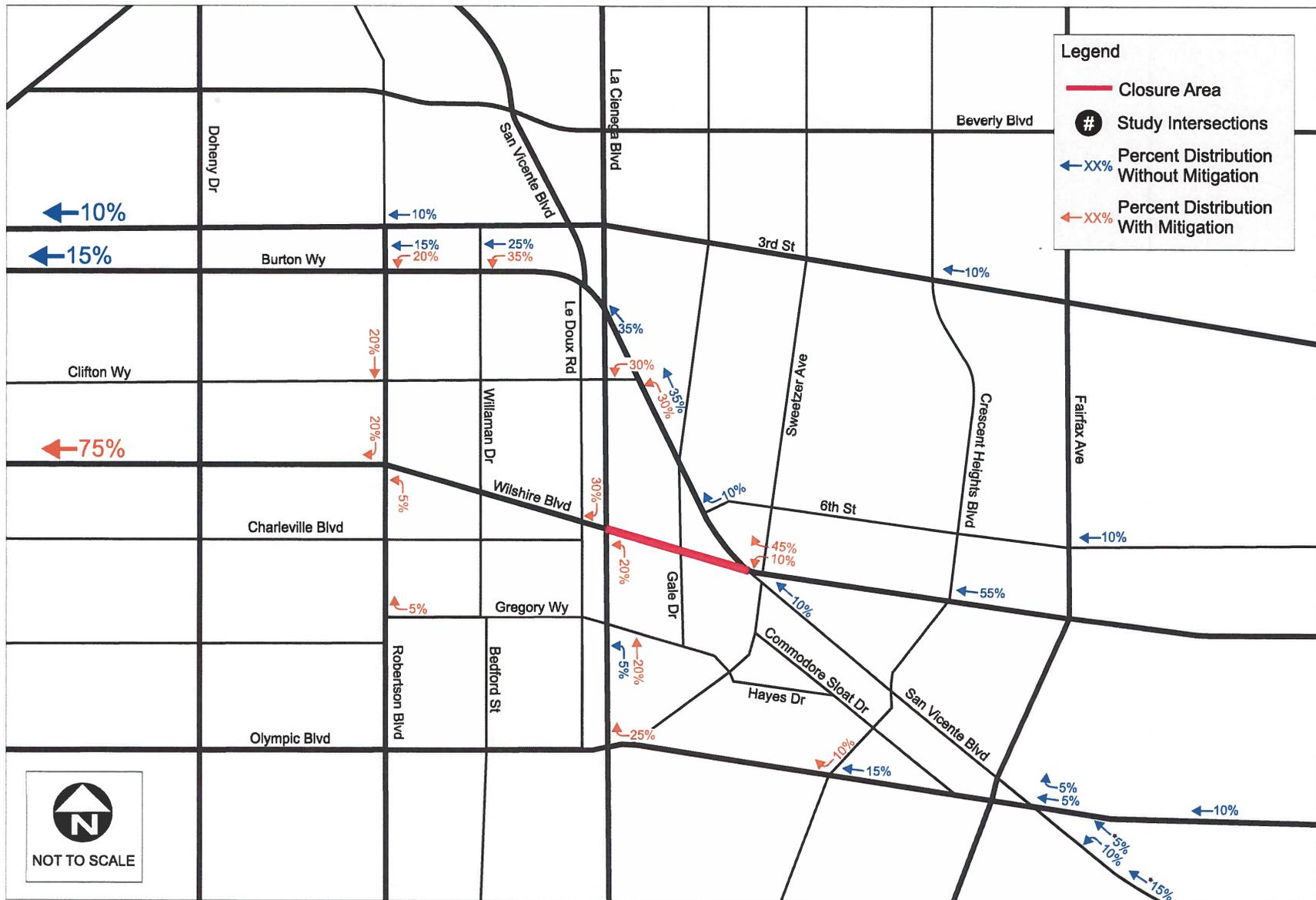
2 = West leg of intersection closed for construction with this scenario.

Notes:

LOS = Level of Service.



* Trip percent at this movement is not considered to be new or diverted traffic, but rather these are trips that would already be making this movement even without construction-related closures.



* Trip percent at this movement is not considered to be new or diverted traffic, but rather these are trips that would already be making this movement even without construction-related closures.

As shown in **Table 9**, during weekday peak hour conditions, with implementation of the mitigation measures, several intersections are forecast to continue to operate at LOS E or F. At the La Cienega Boulevard/Clifton Way and Crescent Heights Boulevard/Olympic Boulevard intersections, the traffic operations would worsen with the mitigation measures in place, as they are intended to keep traffic off the local roads as much as possible. This results in shifting more volumes to these intersections.

Table 10 summarizes the Saturday LOS at the study intersections. LOS calculations sheets are provided in **Appendix B**.

**TABLE 10: TRAFFIC DURING CONSTRUCTION WITH MITIGATION
SATURDAY INTERSECTION PEAK HOUR LEVEL OF SERVICE**

Intersection		Traffic Control	Mid-day Peak Hour	
			V/C	LOS
1	Robertson Blvd /Clifton Wy	Signalized	0.405	A
2	Robertson Blvd /Wilshire Blvd	Signalized	0.822	D
3	Robertson Blvd /Gregory Wy	Signalized	0.448	A
4	La Cienega Blvd /Clifton Wy	Signalized	0.956	E
5	La Cienega Blvd /Wilshire Blvd ¹	Signalized	0.734	C
6	La Cienega Blvd /Gregory Wy	Signalized	0.693	B
7	San Vicente Blvd /Wilshire Blvd ¹	Signalized	0.935	E
8	Crescent Heights Blvd /3rd St	Signalized	0.659	B
9	Crescent Heights Blvd /Olympic Blvd	Signalized	0.669	B

1 = East leg of intersection closed for construction with this scenario.

2 = West leg of intersection closed for construction with this scenario.

Notes:

LOS = Level of Service.

As shown in **Table 10**, similar to weekday conditions, the traffic operations are expected to worsen at the La Cienega Boulevard/Clifton Way intersection as this intersection’s westbound left-turn movement would facilitate approximately 30% of the westbound Wilshire Boulevard diverted traffic.

7.0 ADDITIONAL ANALYSIS METRICS

In addition to using model volumes to develop intersection LOS, other metrics were used to assess the overall impact of the project. These metrics were summarized for the study area using the travel-demand model and include:

- Vehicle Miles Traveled (VMT);
- Vehicles Hours Traveled (VHT); and
- Vehicle Hours of Delay (VHD).

Table 11 summarizes the results of the analysis for existing conditions, traffic conditions with closure (without mitigation), and traffic conditions with closure (with mitigation) during the weekday conditions.

TABLE 11: COMPARISON OF ADDITIONAL METRIC RESULTS PER SCENARIO

Scenario	Vehicle Miles Traveled (VMT)		Vehicle Hours Traveled (VHT)		Vehicle Hours of Delay (VHD)	
	AM Peak Period	PM Peak Period	AM Peak Period	PM Peak Period	AM Peak Period	PM Peak Period
<i>Existing</i>						
Arterials	142,480	249,890	6,560	14,060	1,500	5,190
Collectors (Local Roads)	5,710	16,950	300	1,060	30	240
<i>Full Closure (Without Mitigation)</i>						
Arterials	142,150	249,950	6,580	14,390	1,560	5,550
Collectors (Local Roads)	7,690	20,490	420	1,330	50	320
<i>Full Closure (With Mitigation)</i>						
Arterials	142,520	249,650	6,680	14,600	1,640	5,770
Collectors (Local Roads)	6,770	20,090	370	1,300	50	310

Based on the model results shown in **Table 11**, the following observations can be made:

- The overall VMT, VHT, and VHD of the study area roadways all increase for both the a.m. and p.m. peak time periods with the full closure of Wilshire Boulevard (both with and without mitigations) when compared to existing conditions without the closure.
- In the full closure (with mitigation) more traffic is diverted onto arterials than in the full closure without mitigation, which meets the purpose of the mitigation measures, which encourage travel on higher functional classifications).
- More delay is experienced in the mitigated full closure alternative than in the full closure alternative without mitigations. However, the majority of travel and delay is encouraged to be on higher functional classifications, and off of the more local facilities.

8.0 CONCLUSIONS

Construction activities for the La Cienega Station as part of the Metro Purple Line Extension Project would result in road closures along a one quarter mile stretch of Wilshire Boulevard between La Cienega Boulevard and San Vicente Boulevard. Two potential construction scenarios have been presented, one involving the full closure of Wilshire Boulevard for approximately six consecutive weeks (Weekdays and Weekends) and the other involving the closure of Wilshire Boulevard for approximately 15 consecutive Weekends (Weekends only). The potential traffic impacts to adjacent streets within the City of Beverly Hills and City of Los Angeles have been studied during weekday and weekend conditions.

Based on the data accumulated from current traffic counts, travel-demand modeling, and consultation with City of Beverly Hills and Metro staff, the analysis has shown that the Wilshire Boulevard closure will have significant traffic impacts at several signalized intersections if conducted during weekdays, but would not have comparable intersection impacts if restricted to weekends. In either case, traffic diversion is anticipated on several residential streets and will require mitigation measures to reduce the impacts of such diversion. With the choice between a five week, seven-day-per-week schedule and a 16 week, weekends-only schedule, the choice comes down to 25 days of significant peak period weekday congestion impacts, versus 16 weekends of not-so-significant congestion impacts, with residential traffic management measures in either case. During weekend-only closure conditions, not all of the proposed mitigation measures would need to be implemented, thus reducing the costs of managing the project's traffic impacts. It should be noted that the conclusions resulting from this analysis relate only to traffic conditions and do not reflect other issues (ie, noise, business accessibility, etc) related to the closures that the City of Beverly Hills may want to consider.