3.1 Introduction to the Environmental Analysis

3.1.1 Introduction

Section 3.0 of this document examines the environmental consequences associated with the proposed project and its alternatives, as described in Section 2.0.

3.1.2 Contents of Environmental Analysis

Section 3.0 includes an analysis of the 17 environmental issue areas listed below:

3.2 Traffic and Circulation
3.3 Parking
3.4 Land Use and Development/Communities and Neighborhoods
3.5 Land Acquisition/Displacement and Relocation
3.6 Socioeconomics
3.7 Visual Quality
3.8 Air Quality
3.9 Noise and Vibration
3.10 Geology, Soils, and Seismicity
3.11 Water Resources
3.12 Biological Resources
3.13 Energy Resources
3.14 Safety and Security
3.15 Community Facilities and Utilities
3.16 Hazards
3.17 Cultural Resources
3.18 Construction Impacts

Within each issue area, the Proposed Project and alternatives are discussed in the following order:

3.x.1 Introduction
3.x.2 Affected Environment
3.x.3 Impact Assessment and Mitigation Measures

3.1.3 Assessment Methodology

Affected Environment

In Section 3.0, the analysis within each issue area begins with an examination of the existing physical environment or baseline setting wherein the Proposed Project would be placed. The regulatory setting, which includes government rules, regulations, plans, and policies applicable to the Proposed Project, are provided in summary format and analyzed for project compliance in Section 3.4 (Land Use and Development/Communities and Neighborhoods). For the purpose of this document, and pursuant to NEPA and CEQA Guidelines, the affected environment used for this impact analysis reflects the actual conditions at the time or preparation of this document.

Impact Assessment and Mitigation Measures

Impact assessment methodology for each issue area includes a number of quantitative and qualitative methods currently used in similar environmental assessment documents, and specifically unique to evaluation of each specific issue. In developing an approach to the analysis of impacts and mitigation measures the following were taken into consideration:

- NEPA and CEQA regulatory requirements;
- Other similar MTA and FTA documents for transit projects;
- Federal Executive Orders;
- Federal and State air quality regulations; and
- Regional and local standards and policies.

Thresholds of significance were developed for each issue area using the above to determine the level of severity of project-related impacts. Impacts found to be significant and unavoidable, or mitigable to a less than significant level were identified. The same methodology was then applied systematically to each project alternative. A comparative analysis of the Proposed Project and the alternatives is provided in Section 5.0 of this document.

Each issue area evaluated the alternatives listed below in the following order:

- No Action Alternative (Baseline)
- Transportation System Management (TSM) Alternative
- Alternative 1: Wilshire BRT (Baseline Median-Running)
- Alternative 1A: Wilshire BRT (Median Adjacent Design Option)
- Alternative 1B: Wilshire BRT (Curb Adjacent Design Option)
- Alternative 2: Wilshire BRT and Exposition BRT (Full Length)
- Alternative 2A: Wilshire BRT and Exposition BRT (MOS)
- Alternative 3: Wilshire BRT and Exposition LRT (Full Length)
- Alternative 3A: Wilshire BRT and Exposition LRT (MOS)
- Subway Design Option at USC/Exposition Park (for Alternatives 2, 2A, 3, and 3A)

Once an impact was identified, feasible mitigation measures were developed that would reduce impacts to less than significant levels. There are impacts that cannot be fully mitigated to less than significant levels. These impacts are referred to as significant and unavoidable impacts in each issue area. The cumulative impacts assessment is presented in Section 4.2 (Long-Term Implications).

3.1.4 Significance Categories

While the criteria for determining significant impacts are unique to each issue area, the classification of the impacts was uniformly applied in accordance with the following definitions:

Less Than Significant Impact (LS): Results in no substantial adverse change to existing environmental conditions;

Significant, Mitigable Impact (S): Constitutes a substantial adverse change to existing environmental conditions that can be mitigated to less than significant levels by implementation of feasible mitigation measures or by the selection of a project alternative;

Significant Unavoidable Impact (SU): Constitutes a substantial adverse change to existing environmental conditions that cannot be fully mitigated by implementation of all feasible mitigation measures or by the selection of project alternative; and

Beneficial Impact (B): Results in a positive change to environmental conditions. This classification is not strictly required by CEQA; however, it provides a useful addition to the range of information being disclosed to the public in this environmental document.

3.1.5 Cumulative Context

"Cumulative impacts" refer to two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts. The individual effects may be changes resulting from a single project or a number of separate projects, whereas the cumulative impact is the change in the environment from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor, but collectively significant, projects taking place over a period of time.

The discussion of cumulative impacts must reflect the severity of the impacts, as well as the likelihood of their occurrence; however, the discussion need not be as detailed as the discussion of environmental impacts attributable to the project alone. Further, the discussion is intended to be guided by the standards of practicality and reasonableness.

The cumulative context for this analysis is based on the Southern California Association of Government's (SCAG) 1998 Regional Transportation Plan (RTP), entitled "Community Link 21". This document is a regional planning document that establishes the goals, objectives, and policies for the region's transportation system and establishes an implementation plan for transportation investments through the year 2020. The Mid-city/Westside Study Area extends through two of the 13 Subregions in SCAG's planning area, including the City of Los Angeles and the Westside Cities Subregion. The RTP reflects transportation, population, employment, and land use data for the five-county SCAG area through the year 2020, and is, thus, an appropriate basis for the analysis of cumulative impacts. Therefore, the cumulative condition is not limited to a list of related projects but is, instead, based upon a summary of projections contained in an adopted planning document (i.e., the SCAG Regional Transportation Plan).

Cumulative impacts are evaluated in each of the technical issue sections (in Sections 3.2 through 3.18 of this document). The cumulative analysis considers the impacts that could occur as a result of implementation of a proposed alternative together with other projects causing related impacts.

3.2 Traffic and Circulation

3.2.1 Introduction

This section describes the Mid-City/Westside Study Area's transportation environment both in terms of the base year of 2000, as well as the forecast year of 2020. It presents data and discussion on existing travel conditions in this corridor, types and patterns of trips, and modes of travel on roadways, including freeways and arterial highways, as well as on transit. It also discusses expected effects of projected growth in travel demand, as well as impacts of the east-west corridor project alternatives on the future transportation system and traffic conditions. General, as well as local impacts upon the transportation system are presented as part of the analysis. General impacts include effects of the project on system-wide transportation performance indicators, while local impacts deal with specific traffic circulation, intersection analysis, general access, neighborhood diversion and parking impacts at the proposed stations. The analysis provides information relative to the affects of each of the five alternatives on the transportation systems within the Study Area in terms of transportation supply and demand.

3.2.2 Affected Environment

The following discussion presents an overview of the transportation system within the Mid-City/Westside Study Area that would be affected by the proposed project alternatives considered under this EIS/SEIR. Transportation improvements in this Corridor Area are being studied in part, for the following reasons:

- Major concentration of activity centers and destinations;
- High employment and population densities;
- Substantial transit-dependent population;
- High levels of existing and projected future travel demand;
- Existing traffic congestion;
- Projected worsening of congestion in the future; and
- Constrained transportation facilities.

The highway transportation system in the Study Area is comprised of a well-defined grid of arterials and freeways generally following a north-south/east-west orientation as shown in Figure 3.2-1. The freeway network in the Mid-City/Westside Study Area includes the San Diego Freeway (I-405), Santa Monica Freeway (I-10), Marina Del Rey Freeway (SR-90), the Harbor Freeway (I-110) and the Hollywood Freeway (US 101). The study area's freeways and streets carry some of the highest traffic volumes in southern California. A total of 1.9 million vehicle-miles are traveled during the evening peak hour on the streets and freeways within the Corridor.

Figure 3.2-1 Study Area

Freeway Network

The following is a description of the freeway network within the study area.

- **Santa Monica Freeway (I-10) –** a major east-west freeway that traverses the entire length of the study area from the Pacific Ocean to Downtown Los Angeles, connecting a majority of the Study Area's communities. This freeway is one of the busiest in the nation and carries some of the highest daily traffic volumes in the country. The I-10 Freeway varies between three and five general lanes in each direction, with several sections of parallel auxiliary lanes and collector-distributor roads. Within the Study Area, the daily traffic volume varies between 149,000 vehicles at the western edge (Pacific Coast Highway) and 325,000 adjacent to the Vermont Avenue/I-10 interchange at the mid-point.
- **Hollywood Freeway (US-101**) **–** a generally east-west oriented freeway that provides the principal direct connection between Downtown Los Angeles and the San Fernando Valley through Hollywood. This freeway generally has four lanes in each direction. Daily volumes vary from 124,000 vehicles in Downtown (Fourth Street interchange) to 276,000 (Glendale Boulevard interchange) at the mid-point of the Study Area.
- **Harbor Freeway (I-110) –** a north-south freeway that connects the Port of Los Angeles to Pasadena via Downtown Los Angeles. The freeway varies between four to five lanes in each direction. South of Downtown Los Angeles, the I-110 Freeway has a two-lane transitway for buses and carpools in the median, which includes some elevated sections. Daily traffic varies between 158,000 vehicles (Sunset Boulevard/I-110 interchange) north of US-101 and 317,000 (Downtown interchanges) in the Study Area.
- **San Diego Freeway (I-405**) **–** major a north-south freeway that connects the San Fernando Valley and points north to the West Side of Los Angeles, and south to Long Beach and Orange County. The freeway varies between four to five lanes in each direction and has a carpool lane outside the Corridor study area south of the I-105 Freeway. Daily traffic on the I-405 Freeway varies between 265,000 vehicles (Sunset Boulevard interchange) and 333,000 (Olympic Boulevard interchange) in the Study Area.
- **Marina Freeway (SR-90) –** an east-west freeway that provides access to the Marina del Rey area from the Inglewood area to the east, and the north-south I-405 Freeway corridor. This approximately four-mile long freeway has four lanes in each direction. Daily traffic volumes range from 32,000 vehicles at the eastern terminus to 77,000 at the I-405 interchange in the western section of the Study Area.

Figures 3.2-2A and 3.2-2B illustrate the portions of the existing freeway network within the study area during the AM and PM peak hour of service, respectively, along with their respective peak hour levels of service (LOS) on freeway segments, which range from LOS A, (free flow conditions) to LOS F (jammed conditions). Given the extensive peak period congestion on many of the area freeways, Caltrans has expanded the LOS F designation to include LOS F-1, LOS F-2, LOS F-3, etc., indicating the number of hours of congested conditions (from one to three) during the peak period.

Arterial Network

The Study Area has an extensive network of arterials that follow two predominant grid patterns or systems, as illustrated earlier in Figure 3.2-1. Arterials generally to the east of La Cienega Boulevard

Figure 3.2-2A Freeway LOS AM Peak

Figure 3.2-2B Freeway LOS PM Peak

have a north-south/east-west orientation, while the arterials to the west of La Cienega Boulevard follow a grid system that is generally parallel and perpendicular to the coast line. Approximately 60 percent of the total daily travel (in vehicle miles) in the Study Area occur on surface streets. During the evening peak hour, a total of approximately 76,000 vehicle hours of travel occur on the corridor's streets and freeways, with approximately 52,000 vehicle hours, or almost 70 percent of evening peak hour travel taking place on surface streets. The following points highlight some of the key features of the Corridor's major arterials (all volumes are two-way volumes):

<u>Major East/ West Arterials (Listed from North to South)</u>

- **Santa Monica Boulevard –** varies between two to three lanes in each direction. Existing evening peak-hour volumes vary from 1,800 vehicles (east of Vermont Ave) to 4,300 (east of Sepulveda Blvd).
- **Beverly Boulevard –** has two lanes in each direction. Current evening peak-hour volumes vary from 2,100 vehicles (east of Vermont Ave.) to 3,300 (east of La Cienega Blvd).
- **3rd Street –** has two lanes in each direction. Current evening peak-hour volumes vary from 2,400 vehicles (east of Vermont Ave.) to 2,600 (east of La Cienega Blvd).
- **Wilshire Boulevard –** varies between two and three lanes in each direction. Wilshire Blvd. carries the highest east-west traffic volumes in the Corridor, with evening peak hour volumes ranging from 2,500 to 7,600 trips, with the volumes peaking near Sepulveda Blvd. in the western portion of the Corridor.
- **Olympic Boulevard –** varies between two and three lanes in each direction. Existing evening peak-hour volumes vary from 3,300 vehicles (east of Vermont Ave.) to 4,500 (east of Sepulveda Blvd.).
- **Pico Boulevard** – varies between two to three lanes in each direction. Current evening peak-hour volumes range from 1,600 vehicles (east of Vermont Ave.) to 3,200 (east of Sepulveda Blvd).
- **Venice Boulevard –** varies between two to three lanes in each direction. Current evening peak-hour volumes range from 1,600 vehicles (east of Vermont Ave) to 3,700 (east of Sepulveda Blvd).
- **Washington Boulevard –** varies between two to three lanes in each direction. Current evening peak-hour volumes range from 1,800 vehicles (east of Sepulveda Blvd) to 2,300 (east of La Cienega Blvd).
- **Jefferson Boulevard –** varies between two to three lanes in each direction. Current evening peak-hour volumes range from 1,000 vehicles (east of Vermont Ave.) to 2,400 (east of Sepulveda Blvd).
- **Exposition Boulevard –** varies between two to three lanes in each direction. Existing evening peak hour volumes were identified as 2,200 vehicles east of Vermont Avenue.
- **Adams Boulevard –** varies between two to three lanes in each direction. Current evening peak-hour volumes were identified as 1,800 vehicles east of Vermont Ave.

Major North-South Arterials (Listed from West to East)

- **Lincoln Boulevard –** varies between two to three lanes in each direction. Current evening peak-hour volumes range between 900 vehicles (north of Wilshire Blvd.) and 3,800 (south of Venice Blvd).
- **Bundy Drive/Centinela Avenue –** varies between two to three lanes in each direction. Existing evening peak-hour volumes range from 2,000 vehicles (north of Wilshire Blvd) and 2,900 (north of Venice Blvd).
- **Sawtelle Boulevard** – has two lanes in each direction. Existing evening peak-hour volumes were identified as 2,100 vehicles south of Venice Blvd.
- **Sepulveda Boulevard –** varies between two to three lanes in each direction. Current evening peak-hour volumes range between 2,400 vehicles (south of Sunset Blvd) and 3,600 (north of Jefferson Blvd).
- **Overland Avenue –** varies between two to three lanes in each direction. Existing evening peak-hour volumes are 2,100 (north of Venice Blvd).
- **Culver/ Robertson Boulevards –** varies between two to three lanes in each direction. Evening peak- hour volumes range from 1,400 vehicles (south of Beverly Blvd) to 2,100 (south of Venice Blvd).
- **La Cienega Boulevard –** varies between two to three lanes in each direction. Current evening peak-hour volumes range between 3,300 vehicles (south of Beverly Blvd) and 7,200 (north of Slauson Ave).
- **Fairfax Avenue –** varies between two to three lanes in each direction. Current evening peak-hour volumes range between 2,400 vehicles (south of Beverly Blvd) and 3,100 (north-east of La Cienega Blvd).
- **La Brea Avenue –** varies between two to three lanes in each direction. Existing evening peak-hour volumes range from 3,700 vehicles (south of Beverly Blvd) and 5,300 (south of Jefferson Blvd).
- **Highland Avenue –** varies between two to three lanes in each direction. Existing evening peak-hour volumes were identified as 3,200 vehicles south of Beverly Blvd.
- **Crenshaw Boulevard –** varies between two to three lanes in each direction. Current evening peak-hour volumes range between 2,700 vehicles (north of Slauson Ave) and 3,200 (south of Venice Blvd).
- **Wilton Place/Arlington Avenue** – has two lanes in each direction. Current evening peak-hour volumes range between 1,200 vehicles (north of Slauson Ave) and 2,800 (south of Venice Blvd).
- **Western Avenue** – varies between two to three lanes in each direction. Current evening peak-hour volumes range between 2,100 vehicles (south of Venice Blvd) and 2,400 (south of Beverly Blvd).
- **Normandie Avenue** – varies between two to three lanes in each direction. Current evening peak-hour volumes range between 1,900 vehicles (south of Beverly Blvd) and 2,500 (north of Slauson Ave).

- **Vermont Avenue –** varies between two to three lanes in each direction. Existing evening peak-hour volumes range from 1,700 vehicles (north of Slauson Ave) to 2,800 (south of Beverly Blvd).
- **Hoover St/Alvarado St –** varies between two to three lanes in each direction. Existing evening peak-hour volumes range from 1,500 vehicles (south of Venice Blvd) to 2,700 (south of Beverly Blvd).
- **Figueroa Street –** varies between two to three lanes in each direction. Current evening peak-hour volumes range from 2,200 vehicles (south of Venice Blvd) to 2,800 (north of Slauson Ave).

Recent detailed traffic counts were collected as part of this study at 33 intersections along Wilshire Boulevard. Figure 3.2-3 illustrates the variation of AM and PM peak hour approach volumes, by direction, at the various intersections along Wilshire Boulevard throughout the Corridor. The figures show that the highest AM peak volume is about 4,500, eastbound, which is recorded at Veteran, while the highest PM peak hour volume is about 3,500 westbound, observed at Sepulveda. The graphs clearly show that in both peaks, the traffic volumes start from about 1,500 vehicles per hour in Downtown Los Angeles, gradually increase from east to west and peak sharply to 3,000 to 4,500 vehicles per hour levels in Westwood. Then the volumes drop off significantly west of the I-405 Freeway, as a large volume of traffic gets on or off the freeway. West of the I-405, the volumes gradually decrease to about 500-1,000 vehicles per hour at the western end of Santa Monica.

While the controlling factor, in terms of network capacity, in an arterial street system is generally the level of congestion at signalized intersections, mid-block segments can also reach capacity if there are not enough through lanes to carry the traffic demand. Figures 3.2-4 and 3.2-5, illustrate the locations where the existing roadways are at capacity in the AM and PM peak periods, respectively. The mid-block segments (links) shown in bold-face in the two figures are those which currently operate at levels of service E or F during the two peaks. The existing arterial segment congestion is relatively spread-out over most of the study area's major arterials, with no major differences between links that are congested in AM or PM peaks. Congestion patterns are more pronounced on arterials north of the I-10 Freeway and east of the I-405 Freeway. East of Fairfax Avenue, north-south arterials appear to be relatively more congested than the east-west arterials. South of the I-10 Freeway, the congested arterial segments are less continuous and are mostly concentrated between Crenshaw Boulevard and Culver Boulevard.

Intersection Levels of Service

A total of 158 intersections within the immediate vicinity of the transit corridors were selected for detailed level of service analysis in this study. These intersections were chosen in consultation with the City of Los Angeles Department of Transportation (LADOT) and other local jurisdiction agencies. They represent key intersections that are directly along the Wilshire and Exposition corridor alignments, would potentially be affected by a nearby transit crossing, or are on a major access route to a planned park-and-ride station. The selection of intersections was made based on proximity to the transit alignment, potential travel pattern orientation, access routes and expected levels of auto access activity at each station. These intersections are illustrated in Figure 3.2-6.

Detailed AM and PM peak period turning movement ground counts were compiled for all existing study intersections, from existing recent data available through the LADOT computerized data files and at other Cities (Beverly Hills, Culver City and Santa Monica), and new data collected during

Figure 3.2.3 Wilshire Volume Variation

Figure 3.2.4 Existing AM arterials LOS E or F

Figure 3.2.5 Existing PM arterials LOS E or F

Figure 3.2.6 Study Intersections

July/August of 2000 at locations where current data was not available. All traffic count data was summarized per the LADOT specified traffic count format. The summertime counts were increased by an average of three percent to reflect typical fall conditions. Current conditions at each study intersection were analyzed using the Operational Analysis Methodology of the 1997 Highway Capacity Manual (HCM). The Operations Analysis Methodology results in a rating of conditions at an intersection based on the average number of seconds of delay experienced by motorists traveling through the intersection. Level of service ranges from Level A, free flow conditions, to Level F (jammed conditions), with top of Level E representing theoretical capacity. Detailed signal timing and phasing information was obtained from LADOT and other agencies and was used as inputs to the intersection analysis. Weekday AM and PM peak hours were selected by agencies for analysis because they represent the most critical periods of traffic congestion along the Wilshire and Expositions corridors compared to other time periods such as weekday or weekend mid-day.

The results of the intersection operating conditions analysis, with levels of service and average delay for each peak period, are included in the Traffic Analysis Report. Among the 158 existing study intersections, 130 are presently operating at acceptable LOS D or better conditions. Only 28 intersections are currently operating at LOS E or F during the morning and/or evening peak periods, as listed in Table 3.2-1.

TABLE 3.2-1
EXISTING 2000 CONDITIONS
STUDY AREA INTERSECTIONS OPERATING AT LOS E/F

	LOS E		LOS F	
Intersection	**AM**	**PM**	**AM**	**PM**
Lincoln Blvd /Olympic Blvd	X	X		
20th Street /Colorado Ave		X		
Bundy Dr / Exposition Blvd			X	
Barrington Ave /Exposition Blvd			X	X
San Vicente Blvd/Federal Ave/Wilshire Blvd			X	X
Sawtelle Blvd /Olympic Blvd	X			
Sawtelle Blvd /I-405 Southbound			X	X
Sawtelle Blvd /Venice Blvd		X	X	
Sepulveda Blvd /Wilshire Blvd		X		
Sepulveda Blvd /National Blvd	X			X
Sepulveda Blvd /Palms Blvd				X
Sepulveda Blvd /Venice Blvd		X	X	
Veteran Ave /Wilshire Blvd			X	X
Westwood Blvd/Santa Monica Blvd		X		
Glendon Ave/Wilshire Blvd			X	X
Santa Monica Blvd/Wilshire Blvd			X	X
S Santa Monica Blvd/Wilshire Blvd			X	X
Doheny Dr /Olympic Blvd		X		
Highland Ave /Olympic Blvd		X	X	
Rossmore Ave /Wilshire Blvd	X	X		
Washington Blvd /Washington Pl		X		
Motor Ave/Venice Blvd		X		
Culver Blvd/Main St/Washington Blvd			X	X
Robertson Blvd /Venice Blvd			X	X

TABLE 3.2-1
EXISTING 2000 CONDITIONS
STUDY AREA INTERSECTIONS OPERATING AT LOS E/F

	LOS E		LOS F	
Intersection	**AM**	**PM**	**AM**	**PM**
National Blvd /Venice Blvd			X	X
La Brea Ave /Exposition Blvd			X	X
Western Ave /Exposition Blvd			X	
Vermont Ave /Exposition Blvd			X	

Source: MMA 2000.

Transit Services

The public transit system serving the study area is comprised of an integrated system of rail and bus transit services. An overview of the existing Mid-City/Westside Study Area bus service operators and routes by Corridor service area is presented in Table 3.2-2. This table includes stops in the study area, total stops, and number of daily transit boardings in the study area.

Within the Study Area, rail transit service is provided by the 22-mile Metro Red Line system operated by the Los Angeles County Metropolitan Transportation Authority (LACMTA or MTA). This heavy rail subway service connects Downtown Los Angeles westerly to the Mid-Wilshire area, with a current terminus at Wilshire Boulevard/Western Avenue, and northwesterly to Hollywood, and then northerly into the San Fernando Valley. In Downtown Los Angeles, the Metro Red Line provides connections to the Metro Blue Line (at Seventh/Metro Station) operating south through southeast Los Angeles to Long Beach, and to the Metrolink commuter rail system, to multiple regional directions, at Union Station. Connections to the Metro Green Line, operating from Norwalk past LAX to the beach communities, can be made via the Metro Blue Line. Future Metro Rail extensions may provide connections to East Los Angeles, as well as to Pasadena and the San Gabriel Valley.

Regional fixed route bus transit service is primarily provided by the MTA along with several municipal operators including Santa Monica and Culver City municipal bus lines. The Los Angeles Department of Transportation (LADOT) and Santa Monica Bus Lines provide commuter express service within the Study Area and to Downtown Los Angeles. Express service typically runs along the Santa Monica Freeway (I-10) from the Westside to Downtown Los Angeles, or along Olympic Boulevard connecting Downtown to Century City. As of June 2000, MTA initiated operations of a regional bus service, the Metro Rapid Bus System, along Wilshire and Whittier boulevards from East Los Angeles to Santa Monica. Foothill Transit operates three routes connecting San Gabriel Valley travelers to the Wilshire Boulevard corridor. Culver City Bus Lines (City Bus) and Santa Monica Municipal Bus Lines (Big Blue Bus) provide local bus service. The fixed route bus system is complemented by community connectors, including LADOT DASH routes, smart shuttle and paratransit services (for transit dependent seniors and handicapped individuals).

The Wilshire Boulevard Transit Corridor is currently served by the Metro Red Line with riders then transferring to MTA Metro Bus Rapid (Route 720) which provides limited stop service to complete their trips to west side destinations. Route 720 provides limited stop service along the entire Wilshire Boulevard segment within the Study Area. MTA Routes 20, 21 and 22 provide local service along Wilshire Boulevard from Downtown Los Angeles to Santa Monica. Foothill Transit operates

Route 481, which provides service along Wilshire Boulevard to a terminus at Wilshire/Western for San Gabriel Valley commuters. Foothill Transit Routes 492 and 494 provide service along Wilshire Boulevard to Wilshire/Union.

No bus lines currently serve the proposed Exposition Boulevard Transit Corridor in its entirety. Between Downtown Santa Monica and the San Diego Freeway, MTA Route 434 and Santa Monica Bus Lines Route 7 are the primary routes. MTA Routes 14/37, 38, and 102 are the primary routes between La Cienega Boulevard and the University of Southern California.

Based on the census data, 41 percent of all work transit trips in Los Angeles County originate in the study area. The remaining 59 percent originate at various points in the County and may potentially run through the study area. West LA (as defined by this report) contains 18 percent of Los Angeles County's population, implying that the transit needs of West LA are higher than the service presently provided.

In addition to the high transit mode split of 14 percent, the Study Area has a significantly higher use of transit than the rest of Los Angeles County. This demand warrants a much higher percentage of transit investment than it has received in the last fifteen years.

As seen in Table 3.2-2, there are currently over 119,000 daily boardings on the bus lines generally along the Wilshire Boulevard Corridor and nearly 76,000 daily boardings on the bus lines generally along the Martin Luther King Boulevard Corridor.

TABLE 3.2-2
BOARDINGS ALONG MID-CITY/WESTSIDE TRANSIT CORRIDORS

Route Number	Study Area # Stops	Total # Stops	Study Area Boardings
Wilshire Corridor			
14/37	6	8	16,309
16	5	7	17,869
20/212/22/320/322	14	14	37,851
27/28/328	6	7	28,977
316	8	10	870
S5	27	27	2,581
S7	34	34	15,030
TOTALS			**119,487**
Exposition/Martin Luther King Corridor			
14/37	6	8	16,309
33	5	7	15,711
38	4	6	6,008
102	4	6	627
105	6	8	12,093
434	6	11	1,269
436	9	11	261
439	4	13	649
S7	6	6	15,030
S8	6	6	6,076
S10	4	7	1,290
LX430	7	9	60

TABLE 3.2-2 BOARDINGS ALONG MID-CITY/WESTSIDE TRANSIT CORRIDORS			
Route Number	**Study Area # Stops**	**Total # Stops**	**Study Area Boardings**
LX431	6	8	133
LX437	6	8	97
LX438	6	9	215
TOTALS			**75,828**
Source: West Los Angeles Transit Corridor Technical Report, SCAG, August 1998.			

Since the implementation of the Metro Rapid Bus (Metro Rapid-Line #720 replacement of Routes 320/322) on Wilshire Boulevard, ridership along the Wilshire Corridor has increased substantially. Boardings on Line 720, which includes the Mid-City/Westside area as well as the eastern half of the route on Whittier Boulevard in East Los Angeles have increased by more than 25 percent, since the initiation of the Metro Rapid Bus service.

Goods Movement

Goods movement in the Mid-City/Westside Study Area is primarily highway-related and occurs on the area's freeway and arterial system. With the exception of designated truck routes and private warehousing/terminal operations, there are no major freight facilities located within the Corridor. The Los Angeles International Airport (LAX) provides extensive freight shipment via regularly scheduled airline and cargo operations. LAX currently handles 78 percent of the air cargo in the five-county southern California region, with more than 50 percent of the air cargo destined for international airports.

Study Area freeways currently carry high volumes of truck traffic, with truck activity concentrated in the eastern and southern portions of the Corridor related to Downtown Los Angeles industrial and warehouse areas and LAX. Within the City of Los Angeles, truck activity is allowed on all streets unless otherwise posted such as on the residential portions of Highland Avenue.

Regional rail freight activity is concentrated east of the Study Area along the Alameda Corridor, which connects the Los Angeles and Long Beach ports area with Downtown Los Angeles distribution facilities, and then to points to the north along the West Coast and east to the Mid-West. Study Area railroad rights-of-way, including the former Southern Pacific rail right-of-way located in the median of Exposition Boulevard, are now owned by LACMTA and have been preserved for future passenger transportation improvements. The Exposition Corridor has previously been studied by the MTA as a potential light rail line. The former Santa Fe rail right-of-way located along Slauson Avenue (running west from Downtown Los Angeles, through Inglewood and then south along Aviation Boulevard at the eastern edge of LAX), has also been purchased by LACMTA. Utilization of a portion of this rail right-of-way was studied for transit use through the *Crenshaw Corridor Route Refinement Study*.

Transportation Centers and Hubs

Though the Study Area is well served by an extensive network of bus and rail transit services, there are few supporting transportation system facilities, such as transit centers and park-and-ride lots. The only transit center located within the Corridor is located near the intersection of Pico and San Vicente Boulevards in the City of Los Angeles. The Rimpau Transit Center at Pico Boulevard and

Rimpau Boulevard provides bus boarding, transfer and layover space for MTA, Santa Monica and Culver City buses. Bus service interface is provided at all of the Metro Red Line stations along Wilshire Boulevard, but only the Wilshire/Western station has off-street space for bus and shuttle interface and layover needs. Santa Monica is currently implementing an improved transit hub in its downtown area on Broadway and Santa Monica Boulevard. The only public park-and-ride lot provided within the Study Area is located at the Federal Office Building in Westwood adjacent to the I-405 Freeway. This facility is more locally based and primarily provides parking for people who then use shuttle service to circulate to Westwood destinations. Two churches provide weekday park-and-ride facilities along Manchester Avenue in the vicinity of LAX. Immediately adjacent to the Study Area, transit centers and park-and-ride lots have been developed associated with the Metro Green Line and the I-110 Freeway/ Transitway projects.

Other Access

The purpose of the City of Los Angeles General Plan Bicycle Plan (part of Transportation Element) is to provide a guide for the development of a citywide bicycle transportation system. The adopted Plan seeks to reduce the barriers to the greater utilization of bicycles for both personal transportation and recreation, with a particular emphasis placed on bicycling as a commute option. The City Plan identifies three classes of bikeways: 1) Class I - bike paths; 2) Class II - bike lanes; and 3) Commuter Bikeways. Route locations shown on the Bicycle Plan Bikeways Map on Figure 3.2-7, are specific to designated public streets and rights-of-way. Within the Study Area the following streets are designated as Class I bike paths:

- Exposition Boulevard
- Slauson Avenue
- Culver Boulevard
- Pacific Avenue
- Pacific Coast Highway/Vista del Mar
- Sepulveda Boulevard
- Manchester Avenue
- Florence Avenue
- Santa Monica Boulevard

The following streets are designated as Class II bike paths:

- Venice Boulevard
- La Brea Avenue
- Washington Boulevard
- Centinela Avenue
- San Vicente Boulevard
- Montana Avenue
- Sepulveda Boulevard

Figure 3.2.7 Bikeways Map

One of the major bicycle facility projects identified in the Bicycle Plan is the Exposition Bike Path. This bike path, whether as a rails-to-trail conversion or a rails-with-trails alignment, would offer direct bicycle access between the Exposition Park area and West Los Angeles. It has been identified as a critical link in the Bikeway System for an area of Los Angeles where few streets are viable for striping of bicycle lanes.

Another major bicycle facility planned in the Study Area is the West Los Angeles Veloway. The Bicycle Plan designates Class I and II facilities in the vicinity of UCLA and the Veterans Administration complex in Westwood as an endorsement of the West Los Angeles Veloway. The ultimate alignment of this facility may vary and is subject to the final approval of the responsible agencies. The elevated Class I portion of this bikeway would provide for direct bicycle access to and from Westwood Village/UCLA campus over Wilshire Boulevard, ultimately linking up with the Santa Monica Transit Parkway Bike lanes at Sepulveda Boulevard. In addition, bicycle paths run along Ballona Creek Channel and the entire length of the beach connecting the Westside to the South Bay area.

Bicycle integration with public transit is currently provided on both rail and bus transit. Bicycle lockers are provided at a majority of the Metro Red Line stations and are well utilized. By MTA policy, bikes on trains are allowed in non-peak hours only. A majority of MTA buses currently have bike racks located on the front to accommodate the transition from bicycle to bus and back again.

3.2.3 Impact Assessment

Thresholds of Significance

In order to determine the locations where the proposed project may cause significant transportation impacts, a threshold of significance is required. In addition to measuring the impacts of additional automobiles that will be attracted to transit stations, this analysis will address the impacts of bus and rail alternatives on intersection traffic signal operations (e.g., the effect of transit priority treatment, extended clearance intervals for safety). This method and type of analysis cannot easily be reflected in the Critical Movement Analysis (CMA) methodology typically utilized by the City of Los Angeles Department of Transportation (LADOT) and other agencies. The CMA method measures only the effect of the addition of project-generated traffic and changes in volume/capacity ratios, as the focus of the its analysis. CMA levels of service (LOS) are defined by ranges of the volume-to-capacity (V/C) ratio at an intersection.

The threshold of significance used in this environmental report utilizes the *Highway Capacity Manual* (HCM) operations analysis methodology to quantify existing conditions and future (2020) conditions at signalized intersections with and without the proposed transit projects. For this study the threshold of significance is based on the <u>amount of change in average vehicular delay</u> incurred by vehicles through the intersection (as opposed to the change in volume/capacity ratios). This provides a more accurate assessment of the impact of signal operational changes, such as signal timing and phasing, as well as changes in lane configurations. Accordingly, the definition of significant impact is as follows:

"An intersection is considered to be significantly affected if the project will cause a deterioration in LOS to E or worse, or results in an increase in the average vehicle delay of 5.0 seconds or more at an intersection projected to operate at LOS E or worse under No Project conditions."

The seconds of delay were derived from the relative change in the V/C ratio change from the CMA thresholds. That is, the 0.02 change in V/C at LOS E (which has range of V/Cs of 0.10) is 20 percent of the range for that LOS. This is equivalent to the 5.0 second change at LOS E (which has a 25 second range, from 55.0 to 80.0 seconds) using the 1997 HCM methodology as shown in Table 3.2-3 below.

TABLE 3.2-3
LEVEL OF SERVICE CRITERIA FOR EVALUATING SIGNALIZED INTERSECTIONS

Level Of Service	Control Delay Per Vehicle (Seconds)
A	≤ 10
B	>10 and ≤ 20
C	20 and ≤ 35
D	35 and ≤ 55
E	55 and ≤ 80
F	> 80

A similar threshold of significance was developed for changes in the V/C ratio on mid-block segments (links) of arterial streets. The capacity of the links was determined based on the number of through travel lanes and the roadway classification. The definition of a significant impact is as follows:

"A mid-block segment is considered to be significantly affected if the project will cause a change in the V/C ratio of the link by 0.02 or more and the resulting level of service on the link is forecast as LOS E or F."

Travel Demand Forecast and Evaluation Methodology

The measures of transportation supply and demand in the Study Area are based upon the results of the LACMTA travel demand forecasting model and its associated database. Travel forecasting models are mathematical models, which describe the relationships between land use and demographics, causes of personal travel, and the resultant amount and location of that travel. These models are statistically derived from observations of individual travel choices obtained through extensive surveys of the region's travel characteristics of travelers and their households.

The travel-forecasting model used in the Mid-City/Westside Transit Corridor Study was developed by the LACMTA, is based upon and receives its demographic inputs from Southern California Association of Governments (SCAG) Regional Travel Demand Model. The model predicts future travel demand based upon several input data items that include:

- SCAG forecasts of growth in population and employment;
- SCAG forecast changes in the socio-demographic characteristics of travelers; and
- Future characteristics of the roadway and transit systems including travel times, costs and system capacity reflective of the planned system (No-Build Alternative) and project alternatives.

Using data generated by the MTA travel demand model, detailed travel pattern information was collected and summarized for 1998 base and future 2020 conditions. For purposes of regional planning, the Los Angeles County area has been subdivided by MTA into areas called Community Statistical Areas (CSA). This study also utilized the CSA geographies within the Corridor Area in particular and Los Angles County in general, as well as whole Counties outside Los Angeles County to develop detailed origin/destination and travel pattern information. Integrated highway and transit forecasts were developed by the MTA Model for all project alternatives for 2020 conditions using specifically coded highway and transit networks corresponding to each bus or rail alignment combination. Model outputs were provided in raw and/or summary format and were used by the team for analysis.

For the Study Area's freeway system, Caltrans uses Level of Service (LOS) designations to assess the performance of the region's freeway system. Levels of service A and B indicate free flow travel, while LOS C identifies the slowing of traffic operations and the start of traffic congestion. Freeways operating at LOS D have traffic volumes that are beginning to approach capacity, but have not yet resulted in break down or unstable flow conditions. LOS E indicates traffic volumes that have reached capacity with unstable flow, and LOS F represents a break down in traffic flow caused by excessive demand, and is indicated by stop-and-go traffic operations resulting in significant delay. LOS F has been further broken down into four sub-categories (F-0, F-1, F-2, and F-3) designed to indicate the duration of the congestion.

Growth in Travel and Its Impacts

Person Trips

A comparison of work trip origins and destinations for 1998 and 2020 conditions is presented in Figure 3.2-8. This graphic reveals that work-travel demand along every study area corridor is expected to increase significantly in the future. This is the case for trips between communities within the Study Area, as well as travel to and from the San Fernando Valley and the east side. Several east-west corridors within the Study Area show travel demand well in excess of 200,000 daily two-way work-trips. The pattern of four distinctive east-west corridors within the study area is apparent for 2020 conditions, with all community to community movements showing significant increases in demand. The "spider shape" networks (typically illustrating origin-destination patterns) for 1998 and 2020 conditions both indicate that there is strong east-west travel demand within the study area along major east-west corridors including: Santa Monica Boulevard, Wilshire Boulevard, Santa Monica Freeway and Exposition/Venice Boulevards. None of these corridors are currently served by a high capacity transit system.

Travel growth characteristics for the Mid-City/Westside Study Area were obtained and summarized from the Los Angeles County MTA's travel demand model. Three of the most meaningful categories of travel characteristics are:

- **Total Daily Person Trips**- number of one-way trips made by all persons in a 24-hour period.
- **Daily Home-Work Person Trips** - the number of one-way trips made by all persons between home **and work** location within a 24-hour period.
- **Daily Transit Person Trips** - the number of one-way trips made by all persons on transit (bus and rail) within a 24-hour period.

A summary of these statistics compiled for 1998 and 2020 base conditions is presented in Table 3.2-4. Statistics related to the entire southern California region (SCAG five-county modeling region of

Figure 3.2-8 Work Trip Origins and Destinations

TABLE 3.2-4 SUMMARY OF PERSON TRAVEL CHARACTERISTICS						
Person Trips and Growth, 1998-2020	**Region**			**Corridor**		
	1998	**2020**	**Growth**	**1998**	**2020**	**Growth**
Total Daily Person Trips	50,920,260	65,855,097	29.3%	8,255,229	9,305,419	12.7%
Daily Home-Work Person Trips	10,404,238	13,046,580	25.4%	2,318,292	2,659,289	14.7%
Daily Transit Person Trips	1,599,917	2,109,868	31.9%	662,835	834,079	25.8%
Home-Work and Transit Trips as a Percentage of Total Trips	**Region**			**Corridor**		
	1998			**2020**		
Total Daily Person Trips	100.0%	100.0%		100.0%	100.0%	
Daily Home-Work Person Trips	20.4%	19.8%		28.1%	28.6%	
Daily Transit Person Trips	3.1%	3.2%		8.0%	9.0%	
Corridor Trips as a Percentage of Regional Trips				**Corridor**		
				1998	**2020**	
Total Daily Person Trips				16.2%	14.1%	
Daily Home-Work Person Trips				22.3%	20.4%	
Daily Transit Person Trips				41.4%	39.5%	
Corridor Internal-Internal Trips and Growth				**Corridor**		
				1998	**2020**	**Growth**
Total Daily Person Trips				4,760,766	5,414,333	13.7%
Daily Home-Work Person Trips				782,875	895,223	14.4%
Daily Transit Person Trips				408,655	487,162	19.2%
Internal-Internal Home-Work and Transit Trips as a Percentage of Total Trips				**Corridor**		
				1998	**2020**	
Total Daily Person Trips				100.0%	100.0%	
Daily Home-Work Person Trips				16.4%	16.5%	
Daily Transit Person Trips				8.6%	9.0%	
Internal Trip Retention Percentage in the Corridor				**Corridor**		
				1998	**2020**	
Total Daily Person Trips				57.7%	58.2%	
Daily Home-Work Person Trips				33.8%	33.7%	
Daily Transit Person Trips				61.7%	58.4%	

Key: Region=Five-County Southern California MTA Modeling Area
Corridor=Mid-City/Westside Study Area

Source: Compiled by Meyer, Mohaddes Associates from LACMTA Travel Demand Model Trip Tables.

Ventura, Los Angeles, Orange counties and urbanized portions of San Bernardino and Riverside counties) are shown on the left side, whereas the information on the right pertains to the Study Area only.

The following paragraphs describe the projected magnitude and trends in travel demand for the study area and make relevant comparisons to the same trends for the southern California region.

All Trips

As seen in the first section of the table, in 1998 there were a total of approximately 50.9 million daily person trips made in the five-county region. As the second row of figures shows, 10.4 million, or 20 percent of these total daily trips are two-way home-to-work trips, and almost 1.6 million of the daily trips, or 3 percent are made on transit. As the table also illustrates, there are nearly 8.2 million daily person trips made in the Corridor area, of which 2.3 million, or 27 percent are home-to-work trips, and over 663,000 trips, or 8 percent are made on transit.

When compared to the region as a whole, it can be seen that the Corridor has a higher percentage of work trips (by 7 percentage points) of all daily trips. This is a reflection of relatively higher population density as well as abundance of employment opportunities in the Corridor. The more notable observation, is the significantly higher transit percentage for Corridor trips compared to the overall regional transit percentage. The Corridor's 8 percent transit mode split is 2.5 times higher than the regional 3 percent mode split. This is a clear indication of two characteristics related to the Corridor area: high transit dependency in certain Corridor communities and relatively high levels of transit services, which are provided in the Corridor.

The significance of the Corridor's travel characteristics compared to the region is shown on the third row of the table. This part of the table has some revealing facts. Whereas, the Corridor's total daily person trips account for 16 percent of the total trips in the region, more than one out of every five home-work trips in the region (22 percent), are related to the Corridor area. This again, points to the higher population and employment opportunities in the Corridor area. The Corridor's share of regional transit trips is extremely significant. The statistics show that 41 percent of daily transit trips made in the region have either an origin or a destination in the Corridor area.

Internal Trips

Travel statistics, which were presented above were related to all trips that either originate within or are destined to the Corridor area. The last three sections of the table provide information about the Corridor's internal trips. Internal trips are those which have both ends of the trip (origin and destination) entirely within the Corridor area. In 1998 there were a total of 4.7 million daily trips, which stayed entirely within the Corridor. Over 782,000 of these, or 14 percent, were work trips, and 408,000, or 9 percent of the total internal trips, were transit trips.

When comparing the internal trips to total trips generated by the Corridor, it can be seen that a relatively large portion of the total trips, more than half (58 percent) stay within the Corridor. This is an indication of availability of travel opportunities (both home and work) for all trips in the Corridor, which results in high trip retention. However, the percentage of retention for work trips is significantly lower at about one out of three (34 percent). This shows that many residents commute to work destinations outside and many internal jobs are taken by residents from other areas. When analyzing the internal capture of transit trips, the trends are even higher than all trips, showing that 62 percent of all transit trips generated by the Corridor stay entirely within the Corridor's boundaries.

Future Trends

Forecasts of travel statistics were also made available form the MTA model for 2020 as shown on Table 3.2-4 in conjunction with the corresponding 1998 information. Comparison of 1998 and 2020 data for each category, both for the region and the Corridor area, provides information about expected growth in magnitude of travel and the relative significance of this growth when compared to the expected regional growth.

The region's 50.9 million total daily trips are expected to grow by 29 percent to nearly 66 million by 2020. Home-to-work trips will grow similarly by 27 percent, from 10.4 million to 13 million. The expected growth in regional transit trips is also relatively consistent, at 26 percent, from 1.6 million to just over 2 million. There is, however, a notable difference between the Corridor and the region as it relates to growth in travel. Overall, all of the three travel indicators show lower growth for the Corridor, compared to the region as a whole. This is a reflection of relative maturity and built-out nature of the Corridor area. While the 1998 to 2020 growth of the regional statistics were between 26 and 30 percent, the Corridor's growth is in the 13 to 25 percent range. In the 22-year span, total daily trips in the Corridor are expected to grow only by 13 percent, from 8.2 million to 9.3 million.

The growth in home-to-work trips is slightly higher, at 14 percent, from 2.3 million to 2.7 million. However, the Corridor's transit trips are expected to increase at a much higher rate than total trips, by 26 percent, from the 1998 level of 662,000 to 834,000 by 2020. It should be noted that this is based on the No Action Alternative, with no major transit improvements in the east-west corridor. The share of daily home-to-work and transit trips as a percentage of the total trips are expected to remain very similar to 1998 trends, both for the region and the Corridor.

With the expected high regional growth levels, the share of Corridor trips - as a percentage of total regional trips - show declines in all categories in 2020 compared to 1998. All daily trips will be only 14 percent, home-to-work trips will drop to 20 percent, and transit trips will fall slightly to 40 percent. It should be pointed out however, that regardless of these declines the Corridor's share of regional travel will still be significant in all categories and is concentrated in a small geographic portion of the region (i.e., the density of trips is still very high). Total internal trips are expected to grow by 14 percent. Internal home-to-work trips are also projected to grow by 14 percent. Internal transit trips are expected to grow by 19 percent.

Several key points can be concluded from the above analysis, which point to the importance of future transit service.

- The Mid-City/Westside Corridor is a highly significant origin and/or destination point for trips in southern California, especially for transit trips, over 41 percent of which have one end in the Corridor
- The Corridor has a significantly higher transit mode split than the region as a whole, and the trend is expected to increase (from nearly 2.5 to 2.8 times the regional mode split)
- The Corridor currently has a very high internal trip retention (over half of all trips), and despite growth in regional trips, is expected to maintain these high internal trip retention percentages

<u>Travel Growth Trends</u>

Figure 3.2-9 shows a map outlining locations of "screenlines" used for analyzing travel corridors in this study. Screenlines are imaginary lines that are used to summarize regional traffic volumes in the study area across selected major freeway and street facilities. The volume information that is derived from a screenline analysis indicates the general magnitude of flow at certain locations, and also helps determine the peak direction and characteristics of traffic at that location. Screenlines can also be used to observe traffic volume growth along a particular travel corridor by comparing existing to future year scenarios, or variations/differences in traffic volumes in various scenarios in the same year. For this study, the total two-way volumes across screenlines are reported, and the percent growth between scenarios and between the existing and no project scenarios are shown. For screenlines labeled "east-west", the traffic volumes reported are on the north-south streets that cross the screenline. For north-south screenlines, the volumes represent the traffic on major east-west streets.

The analysis screenlines are defined as follows:

- **Screenline 1** parallels the south side of Sunset Boulevard and then along the south side of Beverly Boulevard
- **Screenline 2** parallels the south side of Venice Boulevard
- **Screenline 3** parallels the north side of Jefferson Boulevard and then along the north side of Slauson Avenue
- **Screenline 4** parallels the east side of Sepulveda Boulevard
- **Screenline 5** parallels the east side of La Cienega Boulevard
- **Screenline 6** parallels the east side of Vermont Avenue

Table 3.2-5 shows the percent growth in total (freeway and arterial) two-way peak hour traffic volumes between 1998 and 2020 base conditions along the defined study area screenlines. Some general conclusions can be drawn from the numbers, as follows:

- Total traffic growth is expected to be greater in the north-south direction than in the east-west direction
- Growth in north-south travel is expected to be between 14 to 23 percent, while east-west travel will grow by 8 to 12 percent
- The volume growth percentage is greatest overall for north-south traffic crossing Screenline 3, near the southern edge of the study area

Figure 3.2-9 Screenline Map

TABLE 3.2-5 PROJECTED GROWTH IN PEAK HOUR TRAFFIC COMBINED FREEWAYS AND ARTERIALS					
		Growth- 1998 to 2020 Base			
		AM Peak		PM Peak	
Screenline #	**Location**	**Volume**	**% Growth**	**Volume**	**% Growth**
1	S/O Beverly Blvd/Sunset Blvd	14,027	16.22%	12,925	16.50%
2	S/O Venice Blvd	9,989	14.21%	9,446	14.69%
3	N/O Jefferson Blvd/Slauson Ave	10,213	21.76%	10,021	23.02%
4	E/O Sepulveda Blvd	4,250	9.51%	3,612	8.70%
5	E/O La Cienega Blvd	4,860	9.92%	4,434	10.07%
6	E/O Vermont Ave	6,338	10.92%	6,376	11.79%

Table 3.2-6 depicts percent growth of volumes at selected freeway segments from 1998 to the base 2020 condition as projected by the MTA travel demand model. The following general observations can be made:

- The percent growth of traffic volumes on the Santa Monica Freeway (I-10), the only major east-west freeway in the study area, decreases from west to east. This is the opposite of the trend shown in Table 3.2-5. This may be due to the fact that this freeway already exceeds capacity and has little room for traffic growth without major capacity improvements
- Traffic growth on the Hollywood Freeway primarily indicates the expected heavy increase in travel demand from the San Fernando Valley into downtown Los Angeles
- The sections of the Harbor Freeway shown are in downtown Los Angeles, and that growth is primarily due to growth in the downtown region
- The high growth on the San Diego Freeway shows that the bulk of additional traffic into and out of the study area will come from the north and south. This is primarily due to increased capacity on this freeway due to the completion of high occupancy vehicle (HOV) lanes. This freeway will experience the highest volume growth of all the freeways in the study area

TABLE 3.2-6 PROJECTED GROWTH IN FREEWAY TRAFFIC VOLUMES			
		Percent Growth- 1998 to 2020 Base	
Freeway	**Segment**	**AM Peak**	**PM Peak**
Santa Monica Freeway I-10	E/O Sepulveda Blvd	8.59%	9.74%
	E/O La Cienega Blvd	3.87%	4.23%
	E/O Vermont Ave	-1.78%	-1.25%
Hollywood Freeway US 101	S/O Vermont Ave	12.96%	17.81%
Harbor Freeway I-110	N/O 3rd St	4.40%	4.91%
	S/O Venice Blvd	5.34%	5.45%
San Diego Freeway I-405	S/O Sunset Blvd	31.97%	29.73%
	S/O Venice Blvd	27.33%	30.67%
	N/O Jefferson Blvd	17.61%	20.42%

Table 3.2-7 below depicts the percentage growth of arterial volumes at selected screenline locations from 1998 to the base 2020 condition as forecasted by the MTA travel demand model.

TABLE 3.2-7
PROJECTED GROWTH IN ARTERIAL TRAFFIC VOLUMES

Screenline	Street	Percent Growth- 1998 to 2020 Base	
		AM Peak	PM Peak
# 1 (E/W)	S/O Beverly Blvd/Sunset Blvd	16.10%	16.61%
# 2 (E/W)	S/O Venice Blvd	13.91%	13.63%
# 3 (E/W)	N/O Jefferson Blvd/Slauson Ave	24.45%	25.56%
# 4 (N/S)	E/O Sepulveda Blvd	9.72%	8.41%
# 5 (N/S)	E/O La Cienega Blvd	11.97%	11.96%
# 6 (N/S)	E/O Vermont Ave	16.60%	15.90%

From this table, the following general observations can be made:

- All screenlines (north-south/east-west) show increase in travel demand compared to 1998 conditions.
- The most significant increase in travel demand for north-south travel is across the Jefferson Boulevard/Slauson Avenue screenline. This projected growth is primarily attributable to the available capacity on these north-south streets.
- The percent increase in volume for east-west travel (Screenlines 4-6) is greater toward the eastern edge of the study area. This is the same trend as shown in Table 3.2-5. The most significant increase in travel demand for east-west travel is across the Vermont Avenue screenline.
- The percent growth increase in east-west travel for arterial streets is greater than the percent growth increase for the Santa Monica Freeway at the screenline locations. This shows that since the freeways are already at capacity, the arterial streets have faster travel times than the freeway. So, east-west traffic is diverting onto the arterial streets.

Sub-Corridor System

To conduct a more direct and specific analysis of travel trends and growth impacts focused on each of the two major east-west corridors in the study area, namely the Wilshire and Exposition corridors, the three north/south screenlines (#4, #5, and #6) were divided into north and south segments. These are designated by letters N (north, Wilshire) and S (south, Exposition) following the number of the screenline.

The sub-corridor screenlines are shown in Figure 3.2-10, and are defined as follows:

- **Screenline 4N** east of Sepulveda Blvd. (Sunset Blvd. to the Santa Monica Freeway).
- **Screenline 4S** east of Sepulveda Blvd. (Olympic Blvd. to Jefferson Blvd.)
- **Screenline 5N** east of La Cienega Blvd. (Santa Monica Blvd. to Venice Blvd.)
- **Screenline 5S** east of La Cienega Blvd. (Santa Monica Fwy. to Slauson Ave).
- **Screenline 6S** east of Vermont Ave. (Sunset Blvd. to Santa Monica Freeway).
- **Screenline 6S** east of Vermont Ave. (Venice Blvd. to Slauson Ave).

Figure 3.2-10 Sub-Screenline corridors

Table 3.2-8 depicts the percent growth of traffic volumes at sub-screenlines between 1998 and base 2020 conditions. The following observations can be made:

- At the west end of the study area, the majority of the growth in traffic is in the Exposition Corridor. The Wilshire Corridor's streets are already at capacity, and as a result, can grow very little without major road widening.
- In the center of the study area, the percent growth increases in the Wilshire Corridor due to increase capacity and lower volumes compared to the west end. The Exposition Corridor is projected to have major growth.
- At the east end of the study area, the Wilshire Corridor has a significant increase in volume. This is due to the available capacity of the arterial streets. The Exposition Corridor shows little growth.

TABLE 3.2-8
CORRIDOR SPECIFIC SCREENLINE SUMMARY

Screenline #s	Location	Percent Growth- 1998 to 2020 Base	
		AM Peak	**PM Peak**
# 4N (N/S)	E/O Sepulveda Blvd	1.36%	-2.56%
	From Sunset Blvd to Interstate 10		
# 4S (N/S)	E/O Sepulveda Blvd	10.64%	11.76%
	From Olympic Blvd to Jefferson Blvd		
# 5N (N/S)	E/O La Cienega Blvd	6.42%	5.41%
	From Santa Monica Blvd to Venice Blvd		
# 5S (N/S)	E/O La Cienega Blvd	10.64%	18.81%
	From Interstate 10 to Slauson Ave		
# 6N (N/S)	E/O Vermont Ave	10.52%	11.56%
	From Sunset Blvd to Interstate 10		
# 6S (N/S)	E/O Vermont Ave	4.37%	5.31%
	From Venice Blvd to Slauson Ave		

Transportation Performance Measures

Table 3.2-9 presents a comparison of several key transportation performance measures, including transit and vehicular travel characteristics, for existing and 2020 base condition for Los Angeles County and the study area. This table shows transit boardings and trips as well as the countywide transit mode share. It also shows vehicle miles of travel (VMT), vehicle hours of travel (VHT) and average highway travel speed statistics for the study area and the County.

The following general observations can be made from Table 3.2-9:

- Both daily person trips and transit trips are expected to increase 19 percent from 1998 to 2020. This is also reflected in the similarity between the transit share percentages for both years.
- Countywide VMT is expected to increase at almost three times the rate of increase of person trips. This indicates that average commutes may be longer in the future.

TABLE 3.2-9 COMPARISON OF TRANSPORTATION PERFORMANCE MEASURES		
Countywide Statistics	**1998 Exist**	**2020 Base**
Daily Person Trips	29,113,086	34,676,805
(% change)		(19.11%)
Daily Transit Trips	1,023,867	1,219,802
(% change)		(19.14%)
Daily Transit Boardings	1,524,407	1,856,190
(% change)		(21.76%)
Daily Bus Boardings	1,379,825	1,605,059
(% change)		(16.32%)
Total Transit Mode Share	3.52%	3.52%
Daily Vehicle Trips	21,316,978	25,342,446
(% change)		(18.88%)
Daily Auto VMT	290,295,124	419,584,000
(% change)		(44.54%)
Daily Auto VHT	8,052,048	16,318,845
(% change)		(102.67%)
Average Vehicle Speed	36.05	25.71
(% change)		(-28.68%)
Study Area Statistics		
Daily Auto VMT	17,918,614	20,060,137
(% change)		(11.95%)
Daily Auto VHT	552,378	806,372
(% change)		(45.98%)
Average Vehicle Speed	32.44	24.88
(% change)		(-23.31%)
AM Peak Auto VMT	4,120,591	4,607,016
(% change)		(11.80%)
AM Peak Auto VHT	179,116	220,785
(% change)		(23.26%)
AM Peak Average Speed	23.01	20.87
(% change)		(-9.30%)
PM Peak Auto VMT	5,834,194	6,537,504
(% change)		(12.05%)
PM Peak Auto VHT	251,154	312,337
(% change)		(24.36%)
PM Peak Average Speed	23.23	20.93
(% change)		(-9.90%)

- Countywide VHT more than doubles between 1998 and 2020.
- VMT and VHT do not increase as much in the study area as in the county. This reflects the fact that the study area is nearly built out and that the highways are near capacity.
- In the future, the daily average speed in the study area will not vary significantly from the AM and PM peak hour average speeds, whereas today the off-peak speeds are much higher than peak hour speeds. This indicates that in 2020, congested conditions will exist for the majority of an average day beyond the traditional peak periods.
- In the study area, VHT increases by four times as much as VMT, indicating increased delays on a much more congested roadway network.

Transportation Impacts of Project Alternatives

This section describes the impacts resulting from a number of future transportation scenarios analyzed in this EIR, including a No Action, Transportation Systems Management (TSM), and five transit project scenarios. Travel demand forecasts were developed for seven future scenarios using the MTA Travel Demand Model for the 2020 horizon year, as listed below.

- **No Action Alternative (Baseline).** The No Action scenario assumes only the funded improvements to the transportation network expected to be in place in 2020 and no transit improvements along the Wilshire and/or the Exposition corridors.
- **Transportation System Management (TSM) Alternative.** The TSM scenario assumes a series of moderate transit improvements (mostly frequency improvements on existing lines and some streamlining of unproductive bus services) that are designed to improve transit service and travel times within the corridor, and attract additional transit riders.

The following scenarios, which were modeled for this Mid City/Westside transit corridor study area, included major transit improvements on the Wilshire and/or the Exposition corridors:

- **Alternative 1: Wilshire BRT (Baseline Median-Running).** Includes a Bus Rapid Transit facility along the median of Wilshire Boulevard from Fourth Street in Santa Monica to Western Avenue in Los Angeles. This will require the removal of one general-purpose traffic lane in each direction, the removal of several left turn pockets and elimination of on-street parking throughout the corridor.
- **Alternative 2: Wilshire BRT and Exposition BRT (Full Length).** This alternative includes the full Wilshire BRT plus a Bus Rapid Transit line from Ocean Avenue in Santa Monica to Seventh Street/Metro Center station in downtown Los Angeles. Most of the route will be constructed in the Exposition Rail right of way owned by MTA. The BRT line follows the same alignment as the LRT, except it will use Figueroa Street north of Exposition Boulevard as a rapid bus line. The westbound BRT will use Flower Street between 7th Street and Olympic Boulevard. In Santa Monica, the BRT also uses City Streets west of 20th Street.
- **Alternative 2A: Wilshire BRT and Exposition BRT (MOS).** This alternative has the full Wilshire BRT plus a Minimum Operable Segment (MOS) of Exposition BRT from Venice Boulevard/Robertson Boulevard in Culver City to Seventh Street/Metro Center station in downtown Los Angeles.
- **Alternative 3: Wilshire BRT and Exposition LRT (Full Length).** This alternative includes the full Wilshire BRT plus a light rail line from Ocean Avenue in Santa Monica to Seventh Street/Metro Center station in downtown Los Angeles. The LRT will mostly follow the Exposition Rail right of way owned by MTA, except a segment in the center median of Venice Boulevard and Sepulveda Boulevard in Culver City and part of Los Angeles, instead of the rail right of way. In the City of Santa Monica, the LRT will operate in traffic on Olympic Boulevard in the median and a westbound travel lane from 20th Street to Lincoln Boulevard. The LRT line will also travel down the center of Hill Street between 35th Street and Washington Boulevard to connect to the existing Metro Blue Line. Both the Hill Street and Venice Boulevard alignments will require the removal of a through lane in each direction. Left turns will either be partially or

completely removed on all streets on which the LRT line travels. Parking is also removed in much of the on-street running segments.

- **Alternative 3A: Wilshire BRT and Exposition LRT (MOS).** This alternative combines the full Wilshire BRT project with an MOS of Exposition LRT from Venice/ Washington station in Culver City to Seventh Street/Metro Center station in downtown Los Angeles.

Impacts on the Transit System

To analyze the effects of the various alternative project scenarios on the transit system as a whole, the following transit performance measures were derived from the MTA travel demand model and summarized for each scenario:

- Daily Segment Boardings
- Daily Transit Trips
- Daily Transit Boardings
- Daily Bus Boardings
- Total Transit Mode Share

Table 3.2-10 provides a summary of Countywide transit performance measures for all scenarios. The statistics for each scenario are compared to the 2020 No Action Alternative. The following general observations can be made from this table:

- All of the project alternatives result in increased Total Transit Mode Share over the 2020 No Action and TSM Alternatives.
- Daily Segment Boardings are the greatest for Alternative 3 (Wilshire BRT and Exposition LRT)
- Daily Transit Trips and Total Transit Mode Share are the greatest for Alternative 2A (Wilshire BRT and Exposition BRT MOS)
- Daily Transit Boardings and Daily Bus Boardings are the greatest for TSM

It should be noted that increased boardings are not necessarily an indicator of efficient transit service. The best indicator is "new transit riders," as measured by "linked" (end-to-end) trips. This measure is presented and analyzed in Chapter 5.0 (Financial Analysis and Comparison of Alternatives). It should also be noted that there are differences in transit operations amongst the three BRT options on Wilshire Boulevard. Alternative 1 will afford opportunities for the best transit operations because the Rapid Buses will operate in a dedicated lane that will not be shared with any other vehicles. Alternative 1 affords the best Rapid Bus travel speeds. Alternatives 1A and 1B will have reduced efficiencies for transit operations because other vehicles will at times share the bus lane or merge across it. With Alternative 1A, vehicles destined for the left turn lane in the center of Wilshire Boulevard, will have to merge into the BRT lane and cross it to reach the left turn lane. At some locations, the number of left-turning vehicles may cause the left turn queue to exceed the storage capacity of the left turn lane, thereby blocking the BRT lane and slowing the progress of buses. Similarly, for Alternative 1B, drivers who desire to turn right off of Wilshire Boulevard onto side streets will have to merge into the BRT lane and turn right from the BRT lane. At cross streets with high levels of pedestrian activity in the crosswalk, the right turning vehicles may have to wait, thereby blocking the buses. Also, the local buses will remain in the curb lane, so Rapid Buses may be delayed by local buses stopping at stops between the BRT stations under Alternative 1B.

Impacts on Highway Performance Measures

This section provides a summary of analysis on transportation performance measures using data from MTA's travel demand model. Performance measures for all future scenarios are compared to the results of 2020 No Action Alternative for Los Angeles County in general and the Mid-City/Westside study area in particular. Analyzed transportation performance measures include: total daily person trips, daily vehicle trips; vehicle miles traveled (VMT); vehicle hours traveled (VHT) and average vehicular travel speed. Table 3.2-11 provides a summary of Countywide and study area performance measures for all modeled scenarios. The following general observations can be made from this table for each alternative.

Transportation System Management (TSM) Alternative

- This is the only scenario that shows a countywide reduction in VMT compared to No Action, by about 0.01 percent.
- However, the trend is reversed when looking at the study area. The TSM is the only alternative, which results in an increase in VMT.

Alternative 1: Wilshire BRT (Baseline Median-Running)

- Countywide, total vehicle trips decrease by about 8,500, but VMT and VHT increase, indicating that some trips are shifted towards the Wilshire BRT.
- In the focused study area, VMT decreases. This is also due to the decrease in 8,500 vehicle trips that shift to the Wilshire BRT.
- Study area VHT increases in all time periods. This also correlates with traffic diversion and longer travel routes, probably associated with the diversion of traffic due to the loss of lanes on Wilshire Boulevard. Refer to the discussion provided on page 3.2-45 regarding the impacts associated with the loss of a lane on Wilshire Boulevard.

This alternative has the lowest average speeds in the study area among all alternatives, although the change in speed is very small.

Alternative 2: Wilshire BRT and Exposition BRT (Full Length)

- Countywide, average speed increases due to the decrease of VHT.
- There is a decrease of approximately 13,500 vehicle trips. Since person trips increases slightly, these lost vehicle trips are new transit trips that use either BRT.
- In the study area, VMT decreases, VHT increases, and average speed decreases for all time frames.

Alternative 2A: Wilshire BRT and Exposition BRT (MOS)

- Overall performance measures countywide and in the study area are worse compared to Alternative 2, but this difference is marginal.

TABLE 3.2-10
COMPARISON OF TRANSIT PERFORMANCE MEASURES

	2020 No Action	TSM	Alternative 1 Wilshire BRT	Alternative 2 Wilshire BRT + Expo BRT	Alternative 2A Wilshire BRT + Expo BRT MOS	Alternative 3 Wilshire BRT + Expo LRT	Alternative 3A Wilshire BRT + Expo LRT MOS
Countywide Statistics							
Daily Segment Boardings	NA	NA	39,597	65,319	56,685	83,987	65,477
Daily Transit Trips	1,219,802	1,220,899	1,232,121	1,239,306	1,238,315	1,247,042	1,235,404
Compared to No Action		0.09%	1.01%	1.60%	1.52%	2.23%	1.28%
Daily Transit Boardings	1,856,190	1,863,491	1,845,564	1,828,978	1,824,767	1,834,632	1,831,514
Compared to No Action		0.39%	-0.57%	-1.47%	-1.69%	-1.16%	-1.33%
Daily Bus Boardings	1,605,059	1,612,463	1,589,314	1,569,451	1,567,444	1,542,995	1,558,574
Compared to No Action		0.46%	-0.98%	-2.22%	-2.34%	-3.87%	-2.90%
Total Transit Mode Share	**3.52%**	**3.52%**	**3.55%**	**3.57%**	**3.57%**	**3.60%**	**3.56%**

TABLE 3.2-11
PERFORMANCE MEASURES FOR PROJECT ALTERNATIVES COMPARED TO 2020 NO ACTION ALTERNATIVE

	2020 No Action	TSM	Alternative 1 Wilshire BRT	Alternative 2 Wilshire BRT + Expo BRT	Alternative 2a Wilshire BRT + Expo BRT MOS	Alternative 3 Wilshire BRT + Expo LRT	Alternative 3a Wilshire BRT + Expo LRT MOS
Countywide Statistics							
Daily Vehicle Trips	25,342,446	25,341,747	25,333,963	25,328,469	25,329,281	25,322,035	25,331,096
(% change)		0.00%	-0.03%	-0.06%	-0.05%	-0.08%	-0.04%
Daily Auto VMT	419,584,000	419,533,328	419,739,776	419,605,376	419,681,224	419,688,776	419,794,696
(% change)		-0.01%	0.04%	0.01%	0.02%	0.02%	0.05%
Daily Auto VHT	16,318,845	16,312,658	16,330,072	16,312,413	16,324,314	16,315,186	16,322,961
(% change)		-0.04%	0.07%	-0.04%	0.03%	-0.02%	0.03%
Average Vehicle Speed	25.71	25.72	25.70	25.72	25.71	25.72	25.72
(% change)		0.03%	-0.03%	0.04%	-0.01%	0.05%	0.02%
Study Area Statistics							
Daily Auto VMT	20,060,137	20,070,594	20,032,829	20,018,003	20,019,999	20,002,863	20,003,976
(% change)		0.05%	-0.14%	-0.21%	-0.20%	-0.29%	-0.28%
Daily Auto VHT	806,372	806,769	812,769	807,207	811,723	805,178	805,690
(% change)		0.05%	0.79%	0.10%	0.66%	-0.15%	-0.08%
Average Vehicle Speed	24.88	24.88	24.65	24.80	24.66	24.84	24.83
(% change)		0.00%	-0.92%	-0.31%	-0.86%	-0.14%	-0.20%
AM Peak Auto VMT	4,607,016	4,606,487	4,598,521	4,593,391	4,594,806	4,578,322	4,592,753
(% change)		-0.01%	-0.18%	-0.30%	-0.27%	-0.62%	-0.31%
AM Peak Auto VHT	220,785	220,564	222,225	221,747	221,882	220,318	221,649
(% change)		-0.10%	0.65%	0.44%	0.50%	-0.21%	0.39%
AM Peak Average Speed	20.87	20.89	20.69	20.71	20.71	20.78	20.72
(% change)		0.09%	-0.83%	-0.73%	-0.76%	-0.41%	-0.70%
PM Peak Auto VMT	6,537,504	6,543,843	6,530,828	6,523,831	6,527,416	6,507,821	6,520,567
(% change)		0.10%	-0.10%	-0.21%	-0.15%	-0.45%	-0.26%
PM Peak Auto VHT	312,337	312,843	315,467	314,847	315,064	313,404	314,558
(% change)		0.16%	1.00%	0.80%	0.87%	0.34%	0.71%
PM Peak Average Speed	20.93	20.92	20.70	20.72	20.72	20.76	20.73
(% change)		-0.06%	-1.09%	-1.00%	-1.02%	-0.79%	-0.96%

Alternative 3: Wilshire BRT and Exposition LRT (Full Length)

- This scenario has the fewest countywide vehicle trips, removing nearly 20,500 vehicles daily from the highway network.
- Average speed in the study area shows the smallest decrease of the project alternatives, although this difference is marginal.

Alternative 3A: Wilshire BRT and Exposition LRT (MOS)

- Overall performance measures countywide and in the study area are worse compared to Alternative 3, but this difference is marginal.

All changes in summary information for the county and study area are statistically small. Looking at the data could lead to a potential for overestimating the impacts. Alternative 3 may show the best overall transportation performance both Countywide and throughout the study area, and Alternative 1 may show the worst overall performance among all modeled scenarios. However, the differences between the two are small, and could be negligible. This indicates that if there are any significant impacts, they should be focused around the transit corridors themselves, and not in the whole region.

Impacts on Highway Corridors

The proposed transit improvements along Wilshire and Exposition corridors will have an effect on highway traffic volumes on surface streets and freeways within the Mid-City/Westside Corridor study area. These effects include reductions, increases and/or redistribution of volumes and the resulting positive or negative operational impacts. This section presents the results of this impact analysis using screenline data from the MTA regional model. The analysis is conducted separately for freeways, arterials, the combined highway system, as well as more specific sub-area corridors discussed earlier. Each of the project alternatives will be compared with the 2020 No Action scenario.

Freeway Impacts

Table 3.2-12 presents percent change in freeway volumes at selected locations from the 2020 No Action scenario to the other six scenarios as forecasted by the MTA travel demand model. It is important to note that the differences in volume and percentage are small for the freeways. This is because most of the study are freeways are expected to exceed their capacity in the future for all scenarios. From this table, general observations can be made for each scenario, as follows:

Transportation System Management (TSM) Alternative

- Most freeways experience a slight drop in traffic volume in the AM peak hour, and a slight increase in traffic volume in the PM peak hour compared to No Action.
- The east end of the study area experiences the higher traffic volume changes in the PM Peak compared to the western areas.

TABLE 3.2-12
IMPACT ON FREEWAY TRAFFIC VOLUMES

AM Peak Hour		Percent Change from 2020 No Action					
Freeway	**Location**	**TSM**	**Alt 1**	**Alt 2**	**Alt 2a**	**Alt 3**	**Alt 3a**
Santa Monica Freeway I-10	E/O Sepulveda Blvd	0.15%	1.25%	1.14%	1.29%	0.52%	1.55%
	E/O La Cienega Blvd	-0.18%	0.76%	0.53%	0.56%	0.02%	0.50%
	E/O Vermont Ave	-0.10%	-0.18%	-0.12%	-0.10%	-0.24%	-0.38%
Hollywood Freeway US 101	E/O Vermont Ave	-0.53%	-0.27%	-0.18%	-0.43%	-0.70%	-0.49%
Harbor Freeway I-110	N/O 3rd St	0.03%	-0.09%	0.04%	0.20%	0.20%	-0.02%
	S/O Venice Blvd	-0.07%	0.00%	-0.09%	0.12%	0.16%	-0.17%
San Diego Freeway I-405	S/O Sunset Blvd	-0.20%	-1.47%	-1.23%	-1.35%	-1.40%	-1.37%
	S/O Venice Blvd	0.05%	-0.22%	-0.29%	-0.28%	-0.51%	-0.18%
	N/O Jefferson Blvd	-0.12%	-0.67%	-0.80%	-0.68%	-0.55%	0.02%
PM Peak Hour		**Percent Change from 2020 No Action**					
Freeway	**Location**	**TSM**	**Alt 1**	**Alt 2**	**Alt 2a**	**Alt 3**	**Alt 3a**
Santa Monica Freeway I-10	E/O Sepulveda Blvd	0.12%	0.64%	0.50%	0.76%	-0.06%	0.49%
	E/O La Cienega Blvd	0.08%	0.20%	0.18%	0.29%	-0.32%	-0.01%
	E/O Vermont Ave	0.82%	0.48%	0.57%	0.59%	0.40%	0.30%
Hollywood Freeway US 101	E/O Vermont Ave	0.28%	0.26%	-0.15%	-0.24%	0.29%	0.31%
Harbor Freeway I-110	N/O 3rd St	0.19%	-0.17%	-0.26%	-0.15%	-0.20%	-0.16%
	S/O Venice Blvd	0.02%	0.01%	-0.09%	0.06%	0.02%	0.05%
San Diego Freeway I-405	S/O Sunset Blvd	0.08%	-0.63%	-0.56%	-0.42%	-0.27%	-0.51%
	S/O Venice Blvd	-0.02%	-0.06%	-0.03%	0.07%	-0.24%	-0.17%
	N/O Jefferson Blvd	0.02%	-0.42%	-0.27%	-0.18%	-0.55%	-0.37%

Alternative 1: Wilshire BRT (Baseline Median-Running)

- Most freeways experience a slight drop in freeway traffic volumes in both peak hours except for the Santa Monica Freeway. The Santa Monica Freeway would experience as much as a 1.25% increase in traffic in the AM peak hour, which would be considered a significant impact.
- Traffic volumes drop on the San Diego Freeway, and increase on the Santa Monica Freeway. This is probably attributable to the reduced peak hour lane on Wilshire Boulevard. Traffic crossing the study area that would normally take the San Diego Freeway to Wilshire Boulevard may be using the Santa Monica Freeway instead.
- The sharp decrease in the San Diego Freeway south of Sunset Boulevard may indicate traffic from the north exiting at Sunset Boulevard instead of Wilshire Boulevard.

Alternative 2: Wilshire BRT and Exposition BRT (Full Length)

- Most freeways experience a slight drop in freeway traffic volumes in both peak hours except for the Santa Monica Freeway. The Santa Monica Freeway would experience as much as a 1.14% increase in traffic in the AM peak hour, which would be considered a significant impact.
- This alternative shows similar impacts to Alternative 1, however, the effects are not as large.

Alternative 2A: Wilshire BRT and Exposition BRT (MOS)

- This alternative shows similar results to Alternative 1 east of La Cienega Boulevard.
- The MOS portion may cause an increase in dive trips west of the end of the Exposition BRT. This may be caused by the increased capacity on the southern end of the study area east of La Cienega Boulevard.

Alternative 3: Wilshire BRT and Exposition LRT (Full Length)

- Most freeways experience a slight decrease in freeway traffic volumes in both peak hours. This alternative has the greatest relative affect on reducing traffic volumes on the Santa Monica Freeway, and is the only alternative, which reduces traffic on that freeway west of La Cienega Boulevard. This drop is mostly attributable to auto trips removed from the freeway as drivers switch to the LRT.
- The Exposition LRT appears to be able to handle the diverted traffic from the Wilshire BRT onto the Santa Monica Freeway.
- Overall impacts on the San Diego Freeway indicates that the Wilshire BRT affects this freeway at Sunset Boulevard.

Alternative 3A: Wilshire BRT and Exposition LRT (MOS)

- Most freeways experience slight decreases in traffic in both peak hours except for the Santa Monica Freeway.
- The same trend in traffic decrease on the San Diego Freeway, and a corresponding increase traffic growth on the Santa Monica Freeway in the PM Peak hour is evident in this alternative.

The freeway impacts appear to be much greater statistically than the regional impacts. The Wilshire BRT appears to cause some traffic diversion onto the Santa Monica Freeway. This diversion may be drivers who are trying to cross the study area that may take Wilshire Boulevard, but with the reduced capacity may find it faster to take the Santa Monica Freeway instead. Since the Exposition LRT attracts about 12,000 new transit trips from auto trips, it may have the effect of canceling the traffic shift due to the Wilshire BRT.

Arterial System Impacts

Table 3.2-13 depicts percent change of arterial traffic volumes at selected screenline locations from the 2020 No Action scenario to the other six scenarios as forecast by the MTA travel demand model. The following general observations can be made for each scenario.

Transportation System Management (TSM) Alternative

- Most arterial streets experience a slight increase in traffic volumes. The AM Peak shows higher increases in the east-west direction, and the PM Peak higher in the north/south direction.
- The western parts of the study area experience the highest traffic volume increases in AM Peak.

Alternative 1: Wilshire BRT (Baseline Median-Running)

- The east-west travel across screenlines 4 and 5 show a drop in traffic. This is due to the significant decrease in corridor capacity due to the reduced peak hour lane on Wilshire Boulevard. Some of this reduction in traffic volume shifts to the Santa Monica Freeway as shown in the previous section. Screenline 6 shows this same trend during the PM peak hour despite the fact that Wilshire Boulevard will not be affected directly by the BRT at Vermont Avenue.

TABLE 3.2-13 IMPACT ON ARTERIALS							
AM Peak Hour Screenline #s	**Street**	**Percent Growth from 2020 Base**					
		TSM	**West 1**	**West 2**	**West 2a**	**West 3**	**West 3a**
# 1 (E/W)	S/O Beverly Blvd/Sunset Blvd	0.05%	0.32%	0.35%	0.27%	0.33%	0.41%
# 2 (E/W)	S/O Venice Blvd	-0.06%	0.44%	0.35%	0.35%	-0.27%	0.15%
# 3 (E/W)	N/O Jefferson Blvd/Slauson Ave	0.01%	-0.04%	-0.12%	0.01%	-0.28%	-0.11%
# 4 (N/S)	E/O Sepulveda Blvd	1.05%	-1.43%	-1.15%	-1.08%	-2.03%	-1.19%
# 5 (N/S)	E/O La Cienega Blvd	-0.08%	-1.53%	-1.99%	-1.68%	-2.42%	-1.91%
# 6 (N/S)	E/O Vermont Ave	0.26%	0.02%	-0.81%	-0.50%	-0.27%	-0.40%
PM Peak Hour Screenline #s	**Street**	**Percent Growth from 2020 Base**					
		TSM	**West 1**	**West 2**	**West 2a**	**West 3**	**West 3a**
# 1 (E/W)	S/O Beverly Blvd/Sunset Blvd	0.08%	0.18%	0.40%	0.37%	0.10%	0.21%
# 2 (E/W)	S/O Venice Blvd	0.27%	0.55%	0.38%	0.40%	-0.13%	0.10%
# 3 (E/W)	N/O Jefferson Blvd/Slauson Ave	0.15%	0.21%	-0.13%	-0.11%	-0.18%	0.03%
# 4 (N/S)	E/O Sepulveda Blvd	0.06%	-1.13%	-1.24%	-1.16%	-1.94%	-1.37%
# 5 (N/S)	E/O La Cienega Blvd	0.15%	-1.39%	-1.51%	-1.41%	-1.85%	-1.66%
# 6 (N/S)	E/O Vermont Ave	0.04%	-0.42%	-0.71%	-0.59%	-1.10%	-0.94%

- Most north-south travel experiences an increase in traffic volumes in both peak hours. The overall increase in north-south traffic is due to vehicles shifting to parallel streets to Wilshire Boulevard or to the Santa Monica Freeway.

<u>Alternative 2: Wilshire BRT and Exposition BRT (Full Length)</u>

- All north-south screenline volumes show similar increases compared to Alternative 1.
- The drop in traffic is greater in Alternative 2 compared to Alternative 1. This is due to auto trips that switch to transit trips.

<u>Alternative 2A: Wilshire BRT and Exposition BRT (MOS)</u>

- The east-west travel across screenline 4 shows no change in traffic. This is due to the MOS segment ending just west of La Cienega Boulevard. The MOS segment should not be expected to reduce traffic in the Westside beyond the effect that the Wilshire BRT will have.
- The overall increase in north-south traffic is due to vehicles shifting to parallel streets to Wilshire Boulevard or to the Santa Monica Freeway. This impact is more noticeable with the Exposition BRT than with the Exposition LRT.

<u>Alternative 3: Wilshire BRT and Exposition LRT (Full Length)</u>

- Almost all screenline volumes show significant decreases in traffic volume compared to No Action. The overall drop in both peak hours is greatest for this alternative.
- This is the only alternative that reduces arterial traffic for all east-west and north-south traffic around the Exposition Corridor.
- This drop in traffic can be entirely attributable to trips diverted to the LRT, since the freeway traffic also showed decreases overall as well.

Alternative 3A: Wilshire BRT and Exposition LRT (MOS)

- The east-west travel across screenline 4 shows no change in traffic. This is due to the MOS segment ending just west of La Cienega Boulevard. The MOS segment should not be expected to reduce traffic in the Westside beyond what the Wilshire BRT will take away.
- The overall increase in north-south traffic is due to vehicles shifting to parallel streets to Wilshire Boulevard or to the Santa Monica Freeway.

Overall Highway System Impacts

Table 3.2-14 presents percent change in total highway volumes (freeways and arterials combined) at selected screenline locations from the 2020 No Action Alternative to the other six scenarios. The following general observations can be made for each scenario:

Transportation System Management (TSM) Alternative

- Most facilities experience a slight increase in traffic volume compared to No Action. The AM Peak shows higher increases in the east-west direction, and the PM Peak shows higher increases in the north-south direction.
- The west end of the study area experiences the highest traffic volume growth in the AM Peak.

Alternative 1: Wilshire BRT (Baseline Median-Running)

- The east-west traffic across screenlines 4 and 5 show highest decreases in traffic. This is mostly due to the significant decrease in east-west capacity due to the elimination of one peak hour lane on Wilshire Boulevard. Most of the other east-west roads in the study area already exceed capacity before the lane is dropped on Wilshire Boulevard, so the diversion of traffic is spread out throughout the study area.

TABLE 3.2-14
IMPACTS ON OVERALL HIGHWAY TRAFFIC

AM Peak Hour Screenline #s	Location	Percent Change from 2020 Base					
		TSM	**West 1**	**West 2**	**West 2a**	**West 3**	**West 3a**
# 1 (E/W)	S/O Beverly Blvd/Sunset Blvd	0.00%	-0.06%	0.02%	-0.02%	0.01%	0.02%
# 2 (E/W)	S/O Venice Blvd	-0.04%	0.23%	0.15%	0.19%	-0.23%	0.03%
# 3 (E/W)	N/O Jefferson Blvd/Slauson Ave	-0.08%	-0.07%	-0.20%	-0.09%	-0.27%	-0.01%
# 4 (N/S)	E/O Sepulveda Blvd	0.79%	-0.84%	-0.65%	-0.58%	-1.42%	-0.58%
# 5 (N/S)	E/O La Cienega Blvd	-0.10%	-0.98%	-1.39%	-1.15%	-1.84%	-1.33%
# 6 (N/S)	E/O Vermont Ave	0.02%	-0.09%	-0.52%	-0.39%	-0.34%	-0.41%
PM Peak Hour	**Location**	**Percent Change from 2020 Base**					
		TSM	**West 1**	**West 2**	**West 2a**	**West 3**	**West 3a**
# 1 (E/W)	S/O Beverly Blvd/Sunset Blvd	0.10%	-0.03%	0.12%	0.14%	-0.02%	0.02%
# 2 (E/W)	S/O Venice Blvd	0.17%	0.33%	0.21%	0.28%	-0.12%	0.04%
# 3 (E/W)	N/O Jefferson Blvd/Slauson Ave	0.09%	0.16%	-0.07%	-0.02%	-0.17%	0.07%
# 4 (N/S)	E/O Sepulveda Blvd	0.05%	-0.71%	-0.82%	-0.72%	-1.46%	-0.94%
# 5 (N/S)	E/O La Cienega Blvd	0.14%	-1.02%	-1.12%	-1.01%	-1.49%	-1.27%
# 6 (N/S)	E/O Vermont Ave	0.27%	-0.08%	-0.31%	-0.25%	-0.48%	-0.41%

Screenline 6 shows little change because Wilshire Boulevard will not be affected directly by the BRT at Vermont Avenue.

- Most north-south facilities experience an increase in traffic volumes in both peak hours due to vehicles shifting to parallel streets to Wilshire Boulevard or to the Santa Monica Freeway.

<u>Alternative 2: Wilshire BRT and Exposition BRT (Full Length)</u>

- All east-west screenlines show decreases in traffic volume. The increased magnitude compared to Alternative 1 is due to auto trips diverting to the Exposition BRT.
- Most north-south facilities experience an increase in traffic volumes in both peak hours due to vehicles shifting to parallel streets to Wilshire Boulevard or to the Santa Monica Freeway.

<u>Alternative 2A: Wilshire BRT and Exposition BRT (MOS)</u>

- Impacts are very similar to those of the alternative 1 for Screenlines 1-4.
- Screenline 5 and 6 show similar decreases as Alternative 2. This is due to auto trips diverting to the Exposition BRT.

<u>Alternative 3: Wilshire BRT and Exposition LRT (Full Length)</u>

- All screenlines show decreases in traffic volume except for Screenline 1 in the AM peak hour. The overall drop in both peak hours is greatest for this alternative.
- This is the only alternative to reduce traffic for all north-south and all east-west traffic.
- The increased magnitude of the east-west traffic volume drop compared to Alternative 1 is due to auto trips diverting to the Exposition LRT.

<u>Alternative 3A: Wilshire BRT and Exposition LRT (MOS)</u>

- The east-west travel across screenlines 4, 5, and 6 show a drop in traffic. This is due to the significant decrease in capacity due to the lane drop on Wilshire Boulevard. Some of this drop in traffic volume shifts to the Santa Monica Freeway or to parallel arterial streets.
- The overall increase in north-south traffic is due to vehicles shifting to parallel streets to Wilshire Boulevard or to the Santa Monica Freeway.
- The drop in traffic across screenline 4 is less than the drop in Alternative 1. Yet the decrease in traffic is significantly greater across Screenlines 5 and 6. The additional decrease in volume across screenlines 5 and 6 is entirely attributable to the Exposition LRT. Also, the lower decrease in volumes across Screenline 4 suggests that a significant number of motorists west of La Cienega Boulevard are driving to the LRT stations at Venice/Washington or La Cienega/Jefferson and using the park and ride facilities there.

Impacts on Focused Corridors

In order to get a more focused view of the highway traffic impacts of the alternatives within the more focused Wilshire and Exposition corridors, traffic crossing the sub-corridor screenlines, as described earlier, was analyzed. Table 3.2-15 depicts the percent change in traffic volumes at east-est travel screenlines generally within the Wilshire and Exposition corridors for each alternative

TABLE 3.2-15 HIGHWAY IMPACTS ON SUBAREA CORRIDORS							
AM Peak Hour	**Location**	**Percent Change from 2020 Base**					
		TSM	**West 1**	**West 2**	**West 2a**	**West 3**	**West 3a**
Screenline 4N (N/S)	E/O Sepulveda Blvd From Sunset Blvd to Pico Blvd	1.51%	-2.26%	-1.49%	-1.54%	-2.15%	-2.11%
Screenline 4S (N/S)	E/O Sepulveda Blvd From Olympic Blvd to Jefferson Blvd	0.50%	2.17%	1.93%	1.90%	0.99%	2.42%
Screenline 5N (N/S)	E/O La Cienega Blvd From Santa Monica Blvd to Interstate 10	-0.10%	-1.84%	-2.06%	-1.93%	-2.45%	-2.10%
Screenline 5S (N/S)	E/O La Cienega Blvd From Venice Blvd to Slauson Ave	-0.01%	0.91%	0.29%	0.57%	0.00%	-0.02%
Screenline 6N (N/S)	E/O Vermont Ave From Sunset Blvd to Interstate 10	-0.13%	-0.19%	-0.62%	-0.58%	-0.47%	-0.74%
Screenline 6S (N/S)	E/O Vermont Ave From Venice Blvd to Slauson Ave	0.08%	-0.01%	-0.35%	-0.07%	-0.21%	-0.10%
PM Peak Hour	**Location**	**Percent Change from 2020 Base**					
		TSM	**West 1**	**West 2**	**West 2a**	**West 3**	**West 3a**
Screenline 4N (N/S)	E/O Sepulveda Blvd From Sunset Blvd to Pico Blvd	0.11%	-3.57%	-3.43%	-3.58%	-4.13%	-3.65%
Screenline 4S (N/S)	E/O Sepulveda Blvd From Olympic Blvd to Jefferson Blvd	0.05%	1.70%	1.59%	1.58%	0.51%	1.59%
Screenline 5N (N/S)	E/O La Cienega Blvd From Santa Monica Blvd to Interstate 10	0.14%	-2.01%	-2.13%	-2.00%	-2.54%	-2.31%
Screenline 5S (N/S)	E/O La Cienega Blvd From Venice Blvd to Slauson Ave	0.16%	0.32%	0.04%	0.52%	-0.37%	0.01%
Screenline 6N (N/S)	E/O Vermont Ave From Sunset Blvd to Interstate 10	0.27%	-0.11%	-0.24%	-0.20%	-0.41%	-0.46%
Screenline 6S (N/S)	E/O Vermont Ave From Venice Blvd to Slauson Ave	0.50%	0.23%	-0.08%	0.11%	-0.31%	-0.04%

from the 2020 No Action Alternative. General conclusions can be made regarding travel patterns in the respective corridors as follows:

<u>Transportation System Management (TSM) Alternative</u>

- The majority of the increase across Screenline 4 is in the Wilshire Corridor, although the Exposition Corridor experiences increases as will.
- The majority of the traffic volume increase across Screenline 6 is in the Exposition Corridor.

<u>Alternative 1: Wilshire BRT (Baseline Median-Running)</u>

- As a general trend, the Wilshire Corridor shows a significant decrease in traffic due to the reduction of one travel lane in each direction on Wilshire Boulevard. The drop shows two distinct phenomena- some vehicle trips are converted to transit trips, and some of the vehicle trips are diverted to other east-west streets and freeways across the entire length of the corridor.

- The increase in the Exposition Corridor is entirely due to traffic diversion from the Wilshire Corridor. The fact that this increase is always less that the decrease in the Wilshire Corridor helps to confirm that some of the decrease in the Wilshire Corridor is due to auto trips switching to transit trips.
- Traffic volumes show more than a 2 percent diversion of trips out of the Wilshire Corridor and into the Exposition Corridor.

<u>Alternative 2: Wilshire BRT and Exposition BRT (Full Length)</u>

- All Wilshire Corridor screenlines show similar changes as in Alternative 1.
- The Exposition Corridor shows a greater decrease in volumes compared to Alternative 1.

<u>Alternative 2A: Wilshire BRT and Exposition BRT (MOS)</u>

- Impacts are similar to Alternative 2 but with a smaller magnitude.

<u>Alternative 3: Wilshire BRT and Exposition LRT (Full Length)</u>

- The Exposition LRT attracts some traffic from the Wilshire Corridor.
- Westside traffic appears to have the least impact with the Exposition LRT. The lost lane on Venice Boulevard does not seem to heavily impact the entire Exposition Corridor area.

<u>Alternative 3A: Wilshire BRT and Exposition LRT (MOS)</u>

- Impacts are similar to the Wilshire BRT Alternative.

The drop in traffic across screenline 4 is less than the drop in Wilshire BRT Alternative for the AM Peak. Yet the decrease in traffic is significantly greater across Screenlines 5 and 6. The additional decrease in volume across screenlines 5 and 6 is entirely attributable to the Exposition LRT. Also, the lower decrease in volume across Screenline 4 indicates that a significant number of people west of La Cienega Boulevard are driving to the LRT stations at Venice/Washington or La Cienega/Jefferson and using the park and ride facilities there. This is shown in the drop in traffic volume from Screenline 4 to 5 in the Exposition Corridor.

Impacts Associated with Loss of a Lane on Wilshire Boulevard

The corridor analyses indicates that the loss of one lane in each direction on Wilshire Boulevard, as a result of the proposed Wilshire BRT (Alternatives 1, 1A and 1B), is expected to have a significant effect on diverting traffic from Wilshire Boulevard to the broader east-west corridor area. This traffic diversion affects most major streets between Sunset Boulevard and the Santa Monica Freeway. Peak hour traffic volumes on Wilshire Boulevard itself are expected to decrease by as much as 25 to 50 percent compared to the No Action Alternative due to the loss of the traffic lane. This decrease in volumes, which is in the range of 300 to 500 vehicles per hour per peak direction, will be spread relatively evenly across most of the east-west facilities (freeway and arterials) throughout the entire corridor. The predicted shifting of the traffic volumes will help keep traffic congestion on Wilshire Boulevard from reaching extreme levels with the proposed lane drop and the operation of the BRT. At the same time, the relatively even distribution of diverted traffic across the study area's arterial grid system with many east-west arterials, from Sunset Boulevard to Slauson Avenue, will also diffuse the extent of the negative traffic impacts on any particular east-west facility.

This does not mean that there are no impacts with the loss of a mixed-flow lane on Wilshire Boulevard. The diversion of traffic is spread out over a large area because many east-west streets north of Washington Boulevard are at capacity before the lane on Wilshire Boulevard is dropped. The diversion of traffic does not just affect the streets immediately around Wilshire Boulevard. This lane drop decreases the overall east-west traffic capacity in the corridor, and the effects of this decrease are felt across the entire study area.

Figure 3.2-11 illustrates the corridor-wide effects of the lane-drop on Wilshire Boulevard, west of Western Avenue, under Alternatives 1, 1A and 1B. As can be seen, PM peak hour volumes on Wilshire Boulevard, at La Cienega Boulevard, will be reduced by 49 percent. The diverted traffic will not be concentrated on one particular parallel facility. The majority of the east-west arterials in the corridor from Sunset Boulevard to Slauson Avenue will experience increase in volume up to 8 percent. Some of the higher increases being on Third Street (8 percent), and Olympic Boulevard (7 percent). Similarly, further west, near Sepulveda Boulevard, volumes on Wilshire Boulevard will decrease by about 23 percent. The drop in volume here is less than the mid-corridor area since Wilshire Boulevard has four lanes in each direction in this section, which will be reduced to three, while near La Cienega Boulevard the lane drop is from three to two lanes representing a larger percentage of capacity reduction. Again, as seen on the figure, the diverted traffic will be distributed relatively evenly across the corridor, with the highest increases on Pico Boulevard (5 percent), Olympic Boulevard (5 percent), and Santa Monica Boulevard (4 percent). Finally, the reduction of trips from Wilshire Boulevard east of the study area (east of Western Avenue) will be relatively minimal. As seen on the figure, the reduction will be less than 5 percent with the diversion effects confined mostly to the immediate parallel streets from Beverly Boulevard to Pico Boulevard.

In order to assess where the shifting of traffic volumes, due to the Wilshire BRT may be significant, the threshold of significance of a 0.02 change in V/C ratio on arterial links operating at LOS E or F was employed. Figure 3.2-12 illustrates the links forecast to be operating at LOS E or F in the AM period under the No Action Alternative in 2020. Figure 3.2-13 illustrates the congested links in the PM Peak hour in 2020 for the No Action Alternative. These two figures illustrate the widespread nature of the projected congestion problems in the study area by 2020, especially when compared to those shown previously in Figures 3.2-4 and 3.2-5, for existing conditions. As can be seen, while in the existing conditions, congestion was more pronounced north of the I-405 Freeway, by 2020 most of the arterials north and south of the I-405 will exhibit heavy congestion patterns. Again, there is not a major difference between links that will be congested in the AM and PM peak hours. However, north-south arterials appear to be still relatively more congested throughout the study area, than the east-west arterials. This is true especially in the following sub-areas:

- From Olympic Boulevard to Jefferson Boulevard in area generally between Fairfax Avenue and Alvarado Street
- From Beverly Boulevard to Third Street in area generally between Highland Avenue and Alvarado Street
- West of I-405 from San Vicente Boulevard to Venice Boulevard

Figure 3.2.11- Percent changes on parallel streets due to lane drop

Figure 3.2-12 2020 AM Peak arterials LOS E or F

Figure 3.2-13 2020 PM Peak arterials LOS E or F

Figures 3.2-14 and 3.2-15 illustrate the links which are significantly affected by the loss of a mixed flow lane on Wilshire Boulevard. These are the links where the V/C ratio is changed by 0.02 or more and the resulting LOS is E or F. The mid-block segments which are affected by the loss of a mixed-flow lane on Wilshire Boulevard are spread throughout the study area and include not only parallel east-west arterials, but also north-south segments of arterials. This is due to the fact that traffic patterns shift as drivers seek alternate routes. It should also be noted that the links which are forecast to be affected by the loss of a lane on Wilshire are not all affected directly by traffic diverting to those links from Wilshire Boulevard. Rather, it is a ripple effect, where some of the traffic which would otherwise be on Wilshire shifts to a nearby parallel route (e.g., Olympic Boulevard), which in turn causes that route to become more congested and some of the traffic which would have been on that arterial shifts to another parallel arterial (e.g. Pico Boulevard). It is interesting to note that the effects of the diversion of traffic from Wilshire Boulevard do not have significant affects on any one parallel arterial for the entire length of the study area. This is partially due to the discontinuous nature of the parallel arterials and the fact that not all segments of the parallel arterials will be operating at LOS E or F.

Person-Carrying Capacity of Wilshire Boulevard

While the capacity of Wilshire Boulevard to carry non-transit vehicles may be reduced due to the conversion of a mixed-flow lane to a bus lane, with the Wilshire BRT, the person-carrying capacity of Wilshire Boulevard increases. The estimated per-lane capacity on Wilshire Boulevard is 750 vehicles per hour. On the segment with the highest forecast decrease in traffic volume, Wilshire Boulevard is projected to lose 500 vehicles per hour in the peak direction. The MTA model forecasts an average auto occupancy of 1.32 persons per car in the Mid-City/Westside area. Applying that vehicle occupancy to Wilshire Boulevard, the person-carrying capacity lost by the conversion of a mixed flow lane is 990 persons in each direction. With an average 3 minute headway between buses, and assuming full buses with a capacity of 135 people, the BRT lane has a person-carrying capacity of 2,700 people, almost three times the capacity of the mixed-flow lane. The Wilshire BRT will have the capacity to carry up to 1,700 people per hour more per direction than the mixed-flow lane it will displace.

In terms of daily person-carrying capacity, Figure 3.2-16 illustrates how the conversion of a lane from mixed-flow operations to a dedicated BRT lane, increases the overall capacity of the corridor by 41 percent. In a prototypical segment with three lanes in each direction, Wilshire Boulevard has a daily auto capacity of 50,000 vehicles per day, which carry about 66,000 persons per day at a 1.32 persons per car daily average. The current mix of buses, at 5-minute headways with 90-persons per bus capacity, can carry about 39,000 persons per day. Under the No Action Alternative, the daily person-carrying capacity of Wilshire Boulevard (in six-lane segments) is therefore, about 105,000 persons per day. With the dedicated BRT lane, the auto carrying capacity decreases by one third to 33,300 with about 44,000 persons in those automobiles. The BRT Alternative, with 135-passenger buses operating at 3-minute headways for 8 hours and 5 minute headways for 12 hours, combined with local buses at 10-minute headways in the curb lane, provides the capacity for 104,000 persons per day to be transported by buses along the Wilshire Corridor. This is a 166% increase in the transit capacity and results in a total person-carrying capacity of 148,000 persons per day, a 41% increase over the No Action Alternative.

Figure 3.2.14- AM Peak significant impacts

Figure 3.2.15- PM Peak significant impacts

Figure 3.2.16- Person Carrying Capacity

General Traffic and Circulation Effects of the Alternatives

This section describes the general effects that the project alternatives will have on traffic circulation. It describes in qualitative terms the changes in circulation and traffic patterns that will occur due to the physical changes to the streets, traffic diversion impacts due to potential loss of capacity and/or congestion along the corridor, and safety issues associated with each of the alternatives.

Alternative 1: Wilshire BRT (Baseline Median-Running)

Circulation Patterns

The design of this Wilshire BRT Alternative includes dedicated lanes for buses in the center of the street. In order to provide a dedicated lane in each direction, either a through travel lane or the parking lane must be removed to provide room for the bus lane. The impacts of the loss of the through lane capacity and the loss of on-street parking were quantified and addressed in the previous section and will be analyzed in the next section using intersection delay methodology. The inclusion of dedicated lanes along the center of the street has several other impacts on overall traffic circulation. The most fundamental impact is the control placed on left turn movements across the busway. In order to reduce the potential for vehicles to turn across the path of a bus, particularly one that may be approaching from the rear on the automobile driver's left, turns across the busway will only be permitted with protected left turn signal phases.

This will have the effect of eliminating left turns at all driveways along the Wilshire Corridor. The number of intersections where left turns will be permitted is also reduced by this alternative, which will affect local travel patterns. Some drivers will adjust their travel patterns by making u-turns at subsequent intersections and doubling back to their destination. Others may turn right onto an adjacent street and go around the block to reach the street onto which they would otherwise have turned left. It is difficult to quantify the exact cumulative effect of all of changes in travel patterns. The impact of left turn diversions to/from the major signalized intersections is accounted for and quantified in the level of service analysis presented in the next section of this report, but this document does not assess the impacts at every minor intersection. At some minor intersections, the number of left turn movements may be increased, potentially increasing delays. At other minor intersections, left turns may be prohibited, causing drivers to shift to alternate routes. However, this document does not assess traffic operations at every minor intersection location in the study area.

Traffic Diversion Through Neighborhoods

The operation of the Wilshire BRT may result in the redistribution of traffic along Wilshire Boulevard into adjacent neighborhoods and onto adjacent parallel streets/arterials, primarily due to the reduction in capacity along Wilshire Boulevard and the loss of left turn lanes at 105 locations. Additionally, redistribution of traffic may occur onto local residential streets from added right turn movements necessitated by a significant number of left-turn restrictions proposed along Wilshire Boulevard.

As discussed in the previous section, it is anticipated that the BRT will cause some traffic to divert to parallel arterials over a wide area. Some trips may divert onto local streets, such as 6th and 8th Streets along most of the Mid-City area of Los Angeles, Charleville and Clayton in Beverly Hills, and Arizona and California Avenues in Santa Monica. The proposal for the Wilshire BRT Baseline

Alternative envisions the removal of left turns at alternating blocks throughout the entire corridor. Under such a proposal, 185 of the 297, or 62 percent of the left-turn lanes at intersections crossing Wilshire Boulevard (between Western Blvd. in Los Angeles and Ocean Avenue in Santa Monica), would be removed in order to provide a more efficient BRT operation. It will also effectively reduce potential conflicts and safety hazards between buses and cars. The remaining 112 intersections, or 38 percent of the total intersections remaining operational, are expected to carry most of the total demand for left-turns along the Wilshire corridor. In addition to potentially exceeding the capacity to make left turns from the remaining available left-turn lanes, the BRT proposal will also affect right-turn movements. It is expected that a great number of drivers, who are unable to make left-turns, will opt to making a series of right turns around the block to ultimately accomplish the desired left turn. This could add traffic to local residential streets adjacent to the major streets where left turns are no longer permitted.

The volume of traffic on residential streets parallel to and adjacent to Wilshire Boulevard should be monitored by the local jurisdictions to determine if the BRT Baseline Alternative has caused any diversion of traffic to residential streets. Each City has a threshold of significance for impacts on residential streets based on the total volume and amount of traffic added to the street. If those thresholds are exceeded within six months of the opening of the Wilshire BRT, the project would be considered to have significantly impacted the street. There are up to 450 blocks along the Wilshire corridor (side streets and the adjacent parallel street) that could be monitored to assess the potential for neighborhood traffic impacts.

Order-of-magnitude cost estimates have been developed for Neighborhood Transportation Mitigation Program (NTMP) measures along the affected residential neighborhoods. These neighborhoods are located in: Park Mile, Miracle Mile, Beverly Hills, Westwood, West Los Angeles, and Santa Monica along the Wilshire BRT Corridor. Cost estimates were developed for the following three categories:

- Traffic monitoring program for 12 months including staff time-- $208,000
- Traffic count program for monitoring traffic impacts-- $450,000
- Implementation of various potential devices and measures including speed humps, chokers, turn restrictions/signs-- $2,632,000

Based on the above, the total cost of NTMP measures is estimated at approximately $3.3 million.

<u>Safety Issues Resulting From Multimodal Operation of Roadway</u>

A number of safety issues will have to be considered in the planning and operation of the Mid-City/ Westside Transit Corridor. Increasing safety for pedestrians and motorists is of paramount importance to LACMTA. A number of lessons have been learned about safety issues over the last decade from the Los Angeles, and other regions, dealing with mixing transit operations - within both exclusive and shared ROW - with general vehicular traffic and pedestrians along the facility, the stations and at intersections/crosswalks.

The Wilshire BRT Baseline Alternative alignment is proposed as a dedicated bus lane running in the median along Wilshire Boulevard. Bus stations would consist of a platform and a canopy, and would be located at the far side of a major intersection. Transit patrons and pedestrians in general would use crosswalks at the intersections to access the bus station in the median.

Motorist safety relative to BRT operations focuses on the topic of introducing and operating a new multimodal system within a shared ROW, especially to a driving public that is not used to such a phenomenon. The two major issues deal with motorists turning left in front of a rapidly moving bus that is approaching from behind, and secondly, motorists driving in the exclusive bus lane. For the former, exclusive left turn lanes would be provided to protect against the event of a motorist turning left in front of a bus approaching from behind. At all locations where left-turns by motorist would be allowed across the busway, these left turns would be controlled by a protected left-turn arrow at all times.

Relative to the BRT operation, pedestrian safety would focus on the ability of a pedestrian to determine that a bus was approaching and proceed to a safe location when the bus has passed. Pedestrian 'WALK/DON'T WALK' signals would be installed (if they are not already) at all signalized pedestrian crosswalks that cross the busway. The crosswalk could be equipped with an active 'BUS COMING' icon to warn pedestrians of the presence of an approaching bus. Non-signalized or mid-block crosswalks leading to bus stops that do not coincide with intersections, would also be equipped with an active 'DON'T WALK' sign to warn of approaching buses. The stations would also be designed to allow for a pedestrian refuge area between exclusive busway and general roadway. In a mid-block station, the station platform will be equipped with a pedestrian actuator button for transit passengers attempting to cross after alighting the BRT. This mechanism would provide security for pedestrians so that they do not become impatient attempt to illegally cross a busy arterial.

Alternative 1A: Wilshire BRT (Median Adjacent Design Option)

<u>Circulation Patterns and Traffic Diversion Impacts</u>

Traffic diversion impacts associated with this alternative will be less than Alternative 1, since left turn lanes will only be eliminated at station locations and mostly at minor streets. Therefore there will be little or no need for circuitous movements around blocks to make left turns at alternative locations. The possible circulation and traffic diversion impacts of this alternative will be only as a result of potential increase in congestion levels on Wilshire Boulevard due to the reduction in capacity with the loss of a through travel lane for general traffic, as was discussed with Alternative 1.

<u>Safety Issues Resulting From Multimodal Operation of Roadway</u>

In this alternative, the buses will be operating in the first lane adjacent to the median. The stations will also be located adjacent to the median and will likely take the space previously occupied by left-turn lanes, which will be eliminated at the station locations. Since regular right-door buses will be used, the buses would have to laterally transition approximately 10 feet to the left prior to the station in order to make the station stop on the left side of the platform. Since a majority of the stations are located immediately after intersections, this lateral shift will mostly take place within the intersection area. The design of this transition will comply with geometric design standards, which are based on maximum travel speeds for safety and will probably use guide markers in the pavement for directing the traffic. The buses will generally be traveling at slower speeds before and after the station stops compared to the mid-block locations. Therefore it is not anticipated that this transition will create any safety or traffic impacts to vehicular traffic on Wilshire Boulevard or the cross streets, or to pedestrians at the station locations. The pedestrians will be controlled by walk/don't walk signals and would have to wait at a station in the middle of the street with buses on one side and through traffic on the other side of the island. This is similar to the stations for Alternative 1.

In this alternative autos will be maneuvering across the bus lane to make left turns at the intersections, therefore, due to the higher degree of interaction between automobiles and buses in this alternative (compared to Alternative 1), there may be some potential for increased conflicts and additional congestion in the left most vehicular through lane. Auto drivers will have to pay more attention to ensure that they can safely move across the bus lane and that there is adequate room to enter the left turn pocket and safely wait to make the left turn. It will be possible to minimize bus/vehicle conflicts through the use of advance detectors, which can expedite a green left turn phase for vehicle queues at the intersections to clear the waiting autos in case of approaching buses.

It will be difficult to sign and stripe the BRT lane with an opening directly adjacent to the left turn lane through which autos could transition from the mixed flow lane, across the BRT lane, into the left turn pocket. In order to improve the safety of this maneuver, the BRT lane would likely have to be signed for "Buses and Left Turns Only" so that left-turning vehicles could enter the BRT lane at the beginning of the block to have time to merge over to the left turn lane. This would reduce the effectiveness of the bus lane, since it would now be shared with some mixed flow traffic. There is also a concern that left turn queues at some locations could exceed the capacity of the left turn lane and block the bus lane. This is addressed in more detail later in the section on intersection level of service. The potential queues of left turning vehicles would not likely present a significant safety concern. Bus drivers would be forced to slow and wait for the left-turn phase to clear the queue. This would slow the bus operations however.

This alternative is suitable for all-day bus operation, but it would be problematic if implemented as a peak-hour-only operation, which is proposed as a potential mitigation measure for parking impacts. Under the peak hour only concept, regular vehicular traffic using the bus lane during the off-peak periods would encounter the lane transitions and would have to maneuver around the stations, momentarily separating from the other two traffic lanes. This is an unusual traffic movement, which could potentially have negative impacts to the traffic flow and vehicular safety. Should the peak-hour-only option be required to mitigate parking impacts, it should only be implemented with either Alternative 1 or 1B.

Alternative 1B: Wilshire BRT (Curb Adjacent Design Option)

Circulation Patterns and Traffic Diversion Impacts

This alternative will have the least amount of potential circulation and traffic diversion impacts compared to Alternatives 1 and 1A. With curbside operation and station sites, no left turn pockets will be lost throughout the corridor. Again, most of the traffic diversion and circulation impacts will be associated with potential increased traffic congestion along Wilshire Boulevard with the loss of a travel lane, similar to Alternatives 1 and 1A.

Safety Issues Resulting From Multimodal Operation of Roadway

Due to its more traditional curbside transit operation and station locations, this alternative will have little or no negative effects on pedestrians, who will be accessing the stations located in the sidewalk area. There may be some potential for vehicular conflict with buses and right turning vehicles, which will be allowed into the bus lane to make right-turns. However, this also is a relatively conventional operation, which should not result in significant effects, other than slower bus operations.

Alternative 2: Wilshire BRT and Exposition BRT (Full Length)

Circulation Patterns

Effects along the Wilshire Corridor will be similar to Alternative 1. Along the Exposition Corridor, the BRT Alternative will not create any major changes in overall circulation patterns along its entire length, since for most of the corridor it will be located in the existing railroad right-of-way and vehicular traffic will cross the right-of-way at existing crossings. Where it runs in dedicated lanes in the center of the street along Venice and Sepulveda Boulevards, it will result in some of the same impacts as the Wilshire BRT. Left turns across the BRT tracks will only be allowed at signalized crossings. This will have the largest effect on driveway access along Sepulveda Boulevard, where left turns could only be made at signalized intersections.

Traffic Diversion Through Neighborhoods

Effects along the Wilshire Corridor will be similar to Alternative 1. Along the Exposition Corridor, it is not anticipated that the operation of the BRT Alternative will result in the redistribution of traffic into adjacent neighborhoods or onto nearby parallel streets/arterials, other than parallel to Sepulveda Boulevard. The street parallel to Sepulveda which may be affected by traffic diversion is Sawtelle Boulevard. The streets parallel to Venice Boulevard that may be affected by traffic diversions are Washington Boulevard and Culver Boulevard.

As traffic congestion increases along the corridor, a percentage of project trips could attempt to find convenient detours around the congested areas to reach stations (especially ones with park-and-ride lots) using side streets through residential neighborhoods. Some may be detouring to reach nearby destinations, while others may be attempting to reach parallel arterials such as Adams, Jefferson and Martin Luther King Boulevards, in order to travel longer distances. However, traffic diversion is not expected to significantly impact residential streets.

Safety Issues Resulting From Multimodal Operation of Roadway

A number of safety issues will have to be considered in the planning and operation of the Mid-City/Westside Transit Corridor. Increasing safety for pedestrians and motorists is of paramount importance to LACMTA. A number of lessons have been learned about safety issues over the last decade from the Los Angeles, and other regions, dealing with mixing transit operations (within both exclusive and shared ROW) with general vehicular traffic and pedestrians along the facility, the stations and at intersections/crosswalks.

The Wilshire BRT Alternative alignment is proposed as a dedicated bus lane running in the median along Wilshire Boulevard. The Exposition BRT alignment is described above. Bus stations would consist of a platform and a canopy, and would be located at the far side of major intersections. For the Wilshire BRT, transit patrons and pedestrians in general would use crosswalks at the intersections to access the bus station in the median.

Motorist safety relative to BRT operations focuses on the topic of introducing and operating a new multimodal system within a shared ROW, especially to a driving public that is not used to such a phenomenon. The two major issues deal with motorists turning left in front of a rapidly moving bus that is approaching from behind, and secondly, motorists driving in the exclusive bus lane. For the former, exclusive left turn lanes would be provided to protect against the event of a motorist turning left in front of a bus approaching from behind. At all locations where left-turns by motorist would be allowed across the busway, these left turns would be controlled by a protected left-turn arrow at all times. There will be enough lateral clearance in the median for the Venice/Sepulveda section of the Exposition BRT that the curb at the median should keep auto traffic out of the bus lanes.

Relative to the BRT operation, pedestrian safety would focus on the ability of a pedestrian to determine that a bus was approaching and proceed to a safe location when the bus has passed. Pedestrian 'WALK / DON'T WALK' signals would be installed (if they are not already) at all signalized pedestrian crosswalks that cross the busway. The crosswalk could be equipped with an active 'BUS COMING' icon to warn pedestrians of the presence of an approaching bus. Non-signalized or mid-block crosswalks leading to bus stops that do not coincide with intersections, would also be equipped with an active 'DON'T WALK' sign to warn of approaching buses. The stations would also be designed to allow for a pedestrian refuge area between exclusive busway and general roadway. In mid-block station, the platform will be equipped with a pedestrian actuator button for transit passengers attempting to cross after alighting the BRT. This mechanism would provide security for pedestrian so that they do not become impatient and attempt to illegally cross a busy arterial.

In the Exposition BRT, some rail crossing gates may still exist. The use of gates at BRT crossings has not been attempted in the U.S. and would require special legislation in order to install such devices at locations where gates do not exist. In addition, because of the relatively short headways between buses, the use of gates may not be an appropriate solution. Current rail standards require a minimum of 20 seconds between the time flashing lights/ gates is activated, and the time the train reaches the crossing. With short headways as the rapid bus approach downtown Los Angeles, the gate down time may cause high levels of delay for cross street traffic.

Alternative 2A: Wilshire BRT and Exposition BRT (MOS)

Impacts of this alternative in all categories will be similar to Alternative 2. The impacts on the Venice/Sepulveda segment will not be a factor because the exclusive bus lanes will exist east of this section only.

Alternative 3: Wilshire BRT and Exposition LRT (Full Length)

<u>Circulation Patterns</u>

Effects along the Wilshire Corridor will be similar to Alternative 1. Along the Exposition Corridor, the LRT Alternative will not create any major changes in overall circulation patterns along its entire length, since for most of the corridor it will be located in the existing railroad right-of-way and vehicular traffic will cross the right-of-way at existing crossings. Where it runs in dedicated lanes in the center of the street along Venice and Sepulveda Boulevards, it will result in some of the same impacts as the Wilshire BRT. Left turns across the LRT tracks will only be allowed at signalized crossings. This will have the largest effect on driveway access along Sepulveda Boulevard. When the LRT alignment travels along Olympic Boulevard in Santa Monica, it will travel in mixed flow, sharing the lane with vehicular traffic. This may cause some diversion from this lane to the adjacent one, if drivers feel uncomfortable driving on the railroad tracks, but this should not cause any significant diversion to alternate routes.

Traffic Diversion through Neighborhoods

Effects along the Wilshire Corridor will be similar to Alternative 1. Along the Exposition Corridor, it is not anticipated that the operation of the LRT Alternative will result in the redistribution of traffic into adjacent neighborhoods or onto nearby parallel streets/arterials, other than parallel to Sepulveda Boulevard. The street parallel to Sepulveda which may be affected by traffic diversion is Sawtelle Boulevard. In addition, the streets parallel to Venice Boulevard including Washington Boulevard and Culver Boulevard, may be affected by traffic diversion.

As traffic conditions increase along the corridor, a percentage of project trips could attempt to find convenient detours around the congested areas to reach stations (especially ones with park-and-ride lots) using side streets through residential neighborhoods. Some may be detouring to reach nearby destinations, while others may be attempting to reach parallel arterials such as Adams, Jefferson and Martin Luther King Boulevards, in order to travel longer distances.

Safety Issues Resulting From Multimodal Operation of Roadway

The propensity for collisions at LRT grade crossings is based primarily on two factors; 1) the LRT alignment type, and 2) exposure (LRV volume & motorist/pedestrian volume). The existing LA Metro Blue Line does not have many similar characteristics to the proposed Exposition LRT alignment, but some comparisons can be made along selected alignments. For instance, the Washington Street alignment of the Metro Blue line shares the same right-of-way type as the proposed Venice and Sepulveda sections of the Exposition LRT alignment. Accident history from LACMTA ten year history of operating the Metro Blue Line (1990-2000) indicates that along the Washington Street alignment, 155 LRV involved collisions have occurred within the 10 year time frame. Nine (9) of these 155 collisions have involved pedestrians, while the other 146 involved motorists. Three (3) fatalities resulting from LRV involved collisions have occurred on the Washington Street alignment in the 10 year period. Two (2) of the fatalities were pedestrians, while one was a motorist. One-hundred three (103) of the 146 LRV-motorist collisions (71%) resulted from motorists turning left in front of, or into, an LRV. This high percentage emphasizes the need to provide adequate safety treatments for left turning motorists.

The Metro-prepared report released on May 19, 2000, called the Summary of Metro Blue Line Train/Vehicle and Train/ Pedestrian Accidents (7/90 to 3/00), indicates the following major factors contributing to accidents with trains:

- Left turn by vehicle in front of train
- Right turn by vehicle in front of train
- U-turn by vehicle in front of train
- Vehicle running through a red traffic light or stop sign
- Encroachment of vehicle into the trackway, other than the above mentioned factors

- Vehicle driving around closed automatic crossing gate
- Pedestrian inattention or ignoring an approaching or departing train
- Pedestrian trespassing on the railroad right-of-way

Light rail vehicles on the Exposition LRT alignment would travel at speeds up to 55 mph. It is expected though that this speed would only be achievable in the stretches of the alignment between Van Ness Avenue and Venice Boulevard where the dedicated railroad ROW with minimum cross street conflicts would permit such speeds. Other sections of the alignment where the LRT is located in the median of such streets as Venice, Sepulveda, and Olympic, the posted speeds from these adjacent streets is 35 mph, therefore, the use of full signal priority would be necessary. As part of the Exposition LRT proposal, the LRVs would preempt the traffic signal ahead at least 20 seconds prior to the train reaching the intersection - this would allow vehicles on the cross street to clear out of the trackway.

As part of its Grade Crossing Safety Program initiated by LACMTA in 1992, several innovative features and demonstration projects have been introduced by the Authority to address some of these safety concerns and evaluate the effectiveness of methods designed to discourage illegal encroachment by both motorists and pedestrians alike. They include pedestrian swing gates, 'second train coming' signage, pedestrian automatic gates, automated photo enforcement and four quadrant gates.

Crossings where trains travel faster than 35 mph would be equipped with gates/ flashing lights along the Exposition LRT. To deter motorists from going around lowered gates, raised medians may be installed at intersections, unless in areas where the geometry of the crossing does not allow this then four-quadrant gates would be installed. At crossings where the LRV would operate in the street at reduced speeds, gates would not be provided. To reduce the likelihood of motorists turning left in front of approaching trains from behind, at all locations where left-turns by motorist would be allowed across the LRT line, these left turns would be controlled by a protected left-turn arrow at all times. Additionally, an active 'TRAIN COMING' sign would also be mounted in the median to alert motorists of the approaching train. Photo enforcement with heavy fines may also be used along the LRT alignment to deter motorists from driving around lowered gates.

Pedestrian safety at Exposition LRT crossings would be addressed in the following manner:

- Signs that warn pedestrians to 'LOOK BOTH WAYS' while displaying a train icon would be placed at each crossing.
- The use of pavement delineation and barriers would direct pedestrians to designated crossing location, and control pedestrian movement.
- ADA approved tactile warning strips that provide visual warning of the dynamic envelope of the train would be used at stations to warn pedestrians of the edge of the platform and would be installed at all designated pedestrian crossings marking the limits of pedestrian occupancy.
- Swing gates that are gravity-operated would be installed at pedestrian crossings that warrant their use. They require a positive action by the pedestrian entering the crossing, thereby forcing awareness of the trackway and the possible presence of an approaching train.

- Pedestrian gates that operate in the same manner as a vehicular gate would be installed at pedestrian crossings wherever their use is warranted– they block pedestrian approach in the presence of a train, specially in location with high train volume and limited sight distance.
- 'SECOND TRAIN APPROACHING' signs may be installed at crossings where two or more light rail transit tracks are present, and the LRV headways are short – they warn pedestrians to look both ways.

Alternative 3A: Wilshire BRT and Exposition LRT (MOS)

Impacts of this alternative in all categories will be similar to Alternative 3. The impacts on the Venice/Sepulveda segment will not be a factor because the LRT will exist east of this section only.

This Alternative will have limited effect on overall traffic circulation patterns, since it will be located in the existing railroad right-of-way and crossings will occur at existing crossings and will have no foreseeable impacts on local residential streets along the Exposition Corridor.

Impacts of Special Events Street Closures on Exposition BRT and LRT Operations

Several special events occur in and near the University of Southern California (USC) campus and the Exposition Park area every year. Some of these events currently entail the closure of streets and/or restriction of traffic in the surrounding area for event traffic control, marching band procession, and/or pedestrian crossing safety. According to the Los Angeles Department of Transportation (LADOT), 108 special events have occurred in the USC/Exposition Park area in the past year. For 62 for those events, traffic officers were deployed to help manage traffic flow. Thirteen of those events resulted in a full closure of Exposition Boulevard between Vermont Avenue and Figueroa Street. Two of these closures were by special events permits or by Los Angeles City Council order. The other eleven closures were initiated or planned by LADOT for traffic management or safety purposes. The following events have required the closure of Exposition Boulevard between Figueroa Street and Vermont Avenue during the last year:

- Los Angeles Marathon
- Revlon Run & Walk
- USC Football Games (6 times)
- World Cup and Other Soccer Events at the Coliseum (4 times)
- MotorCross Event

Additional events in the future may result in the closing of Exposition Boulevard as well. Generally, Exposition Boulevard is closed for USC football games and other major events in the Coliseum attracting 50,000 or more attendees. The rationale for closing the street during major events of greater than 50,000 attendees is to maintain pedestrian safety of those crossing the street and to distribute post-event traffic loads to multiple freeway ramps to ease traffic congestion. This traffic distribution strategy improves parking lot clearance times for both Exposition Park and USC. Exposition Boulevard was closed for multiple days as a result of the LA Ford Street Races two years ago; however, according to LADOT that event has since been discontinued and is not expected to return to the Exposition Park area any time soon.

At this point, no significant changes are expected in regards to the number of times Exposition Boulevard would be closed for special events in the future. LADOT estimates that Exposition Boulevard will be closed 10 - 15 times a year due to special events, primarily on weekends or late in the evening. Exposition Boulevard has not been closed as a result of a special event during any weekday peak-period for more than two years.

Generally, Exposition Boulevard is closed before and after special events. This is to allow people to cross Exposition Boulevard from the parking structures at USC to reach Exposition Park. During USC football games, the street is closed when the band marches from the campus to the stadium and immediately after the game, when pedestrians are crossing the street to return to on-campus parking and residential facilities.

When Exposition Boulevard is closed to traffic during events, the operation of a BRT/LRT line might be impacted if it were using an at-grade alignment. Below grade BRT/LRT lines would not be impacted by any street closures at Exposition Park. There are other measures however, that could be taken to allow for at-grade operations of BRT/LRT during special events.

During major events, an at-grade LRT would cause impacts to overall event and traffic operations. Some measures have been recommended to allow the LRT to run while Exposition Boulevard is closed. One possible strategy is to create a “Bus Bridge” which would connect the two sides of the operating LRT with express buses. These buses would pick up passengers at one terminus and shuttle them to the other terminus avoiding the street closures. Another recommended measure would allow for the LRT to operate if Exposition Boulevard is closed. Traffic control personnel from the Department of Transportation would need to be present to stop vehicular or pedestrian traffic. This would allow columns of pedestrians to cross the streets at periodic intervals between LRT trains. Fences would have to be built along the median of Exposition Boulevard on both sides of the LRT line to prevent people from crossing the LRT tracks mid block. During the LA Marathon, the race could be restricted to the north side of Exposition Boulevard allowing for trains to run during the event potentially at slower speeds. Similar events such as the Revlon Run/Walk could also be restricted to one side of the street to allow simultaneous LRT operations. This would allow the race to run without crossing the path of the LRT.

At-grade BRT buses will also be impacted in a street closure scenario. The flexibility of the buses will allow for them to travel on alternate streets to bypass the closed streets during a special event. They could run in mixed flow traffic until re-joining the corridor, or they could also have special lanes marked by LADOT to allow the buses to move quickly before and after special events so that these buses will not be severely delayed by traffic.

Maintenance Yard

The additional vehicles that would have to be added to the MTA bus or light rail fleet to serve the corridor alternatives will require maintenance and overnight storage. There are six potential sites at which the maintenance of buses could be accommodated, one of which could also serve as a light rail vehicle maintenance yard. This section discusses the transportation impacts associated with implementation of a maintenance yard at each of these alternative sites. The site plans for the yard at each potential location have not been developed, so the access points and internal circulation are not known at this time. The transportation impact analysis focuses on the accessibility of each site and its proximity to the corridor alternatives, as well as the types of adjacent streets which might be used by buses. It is anticipated that the number of employees, which would work out of each maintenance yard, will be about 160 employees. Most of these employees arrive and depart the yard in the off-peak hours. Many arrive prior to the morning commute period so that buses can be readied for their commute runs. Others work in the late evenings, when the buses return from their daily runs. The movement of buses and light rail vehicles to/from the maintenance yards also will occur outside the peak commute periods, since the transit vehicles must be in service during those peak time periods.

Site 3: Northwest Corner Chavez & Mission

This site is located at the intersection of two Major Highways in the City of Los Angeles. Buses which would deadhead to/from this site to the start or finish of runs in Santa Monica would likely use the Santa Monica Freeway and could circulate around downtown Los Angeles via either the I-110 or US 101 to reach the Mission Road interchange on the 101 freeway. This interchange is only one block from the yard site, so the buses would have minimal impact on arterial streets. Buses traveling between the yard and the eastern ends of the corridors would travel on arterial streets through downtown, similar to existing buses bound to/from the adjacent bus yard at Vignes/Cesar Chavez. They would not be expected to cause any significant impacts on the downtown streets.

Site 4: Existing MTA Division 1 at Alameda & 6th

The new maintenance yard would be an expansion of the existing Division 1 yard to a site across Industrial Street. Buses traveling to/from this site would follow the patterns of existing Division 1 buses and would not affect any new streets in this predominantly warehouse/industrial/produce neighborhood. Industrial Street could be affected by the bus traffic if an access point is provided on Industrial or if vehicles are shuttled across Industrial from the existing yard to the new yard, but Industrial Street is a minor street that only extends for five blocks. It does not serve as a primary circulation route in this part of the Central City East. There is a high percentage of trucks in the traffic volumes around this site. It is located in close proximity to the Wilshire-Whittier corridor, so buses would have limited down time circulating to/from service. Buses which would deadhead to/from this site to the start or finish of runs in Santa Monica would likely use the Santa Monica Freeway and would use the Alameda street interchange on the freeway. This interchange is less than one mile from the yard site, so the buses would have limited impact on arterial streets.

Site 6: Northeast Corner Alameda & Washington

This site is located at the intersection of two Major Highways in very close proximity to the I-10 freeway, with the Alameda Street ramps only one-half block away. Buses which would deadhead to/from this site to the start or finish of runs in Santa Monica would likely use the Santa Monica Freeway and would use the Alameda street interchange on the freeway. These buses would have minimal impact on arterial streets. Buses traveling to/from the corridors via downtown city streets would likely utilize Alameda Street to connect with the Wilshire-Whittier corridor or Washington Boulevard to connect with the Figueroa –Exposition corridor. There are high percentages of trucks in the traffic volumes around this site.

Site 7: Southeast Corner Alameda & Washington

This site would have the same general impacts as Site 7, directly across the street.

Site 8: Exposition ROW, Hooper to Central

Site 8 is the one location that could be developed as either a BRT yard or and LRT yard, since it is located on the Exposition ROW owned by the MTA.

BRT Yard. This site is located about three quarters of a mile south of the Santa Monica Freeway and could be accessed via the interchange at Central Avenue a Secondary Highway. It is surrounded by local streets, with some nearby residential areas. In order to avoid impacting the residential streets, employees and buses would likely be routed via Central Avenue to/from the north. This site is a little more removed from the starting point for service on the Wilshire Corridor than some of the other sites.

LRT Yard. Use of this site for the LRT yard would have similar traffic impacts as its use as a BRT yard, in terms of employee travel to/from the site. Employees would be encouraged to utilize Central Avenue rather than any of the adjacent residential streets. The circulation of LRT vehicles would be along the former railroad right-of-way to/from the West. This would result in the re-activation of nine at-grade crossings of streets to the west of the LRT yard. These crossings would be upgraded to include warnings lights and gates, and the light rail vehicles would move through them at slow speeds, since they would be out of service, so this would not be expected to cause any significant traffic impacts or safety concerns. The out-of-service vehicles would not need any priority treatment at these grade crossings and could wait, if necessary, to cross when they would not negatively impact north-south traffic flow.

Site 9: South Park Shops at 54th & Avalon

This yard site is located at an existing MTA maintenance facility, so it would not create new intrusion of buses into this predominantly residential area. It would increase the number of daily bus and employee trips in this area. In order to avoid neighborhood traffic impacts, the employees and buses would be routed via Avalon Boulevard, on the eastern perimeter of the site, to/from Slauson Avenue for access to the I-110 Freeway. This would increase the number of vehicle trips passing the Jefferson Middle School site, on the east side of Avalon Boulevard, but should not significantly affect pedestrian safety because of the availability of a signalized pedestrian crosswalk at Avalon/Slauson. This site is the most removed from the Wilshire and Exposition corridors, so it would involve the most dead head travel by out-of-service buses.

Intersection Traffic Impacts

General Issues Related to Intersection Impacts

Signal modifications will be implemented for BRT and LRT operation. LADOT currently has the necessary hardware/software to implement a transit priority treatment at signalized intersection to address transit signal priority. The use of loop detectors embedded in the pavement in advance of traffic signals, or newly emerging visual recognition technologies placed above intersections on signal mastheads, will now allow traffic signal controllers to detect a bus as a distinct object separate from a car or truck. This in turn will provide the signal processor with sufficient warning to adjust the signal phases on cross streets so the bus may receive a green indication when it reaches the cross street. In certain cases this will occur by lengthening the green phase for the transitway (extend green) and the parallel streets along Exposition Boulevard, and other cases it may occur by shortening the green phase on the north/south streets (early green).

The proper placement of advance detection devices will avoid abrupt changes in a signal cycle, (e.g., the green phase not truncated prior to a minimum specified time). Locating the detectors far enough in advance of the cross street will allow a bus traveling at a planned speed to arrive at the cross street coincident with a green signal indication. However, it may not be feasible in every instance to provide the same level of priority treatment for buses traveling in both directions, especially if bus headways become too short. If such a condition prevails, then the peak direction of passenger demand would be assigned a higher level of priority treatment.

In those portions of the corridor along Exposition Boulevard where the transitway is adjacent to and runs parallel to an arterial street, buses will receive a green signal indication simultaneously with the parallel street. The stop bar for traffic approaching the transit crossing will be located before the transit crossing so that there will not be any traffic stopped between the transitway and the adjacent streets' traffic signals. A brief clearance interval may be required in the north/south signal phase to ensure that no vehicles are stopped on the transitway crossing, or between transit crossing and the adjacent east/west streets. Turn movements from the adjacent east/west street will also require separate signal phases with red arrows when the transit vehicles are present or crossing to avoid incidents from the conflicting north/south movement. It will be necessary to prevent the left or right turns across the transitway when a transit vehicle is moving in conjunction with the through traffic on the parallel arterial.

Numerous traffic signals will need to be modified, typically to add a signal phase for transit vehicles crossing the roadway or the intersection. Some of these modifications also entail relocating the stop bars and providing clearance intervals for vehicles crossing the transitway. In addition, signal modifications will upgrade signal controllers/ software to accommodate the transit priority treatment. New signals will need to be installed where the transit signal is off-set from the nearest traffic signal by more than 150 feet. This would constitute a separate signal that would be interconnected to the adjacent traffic signal. It is expected that all BRT and LRT at-grade crossings will be signalized.

A decrease in levels of service at signalized intersections may be experienced in the Wilshire Boulevard corridor. The increase in traffic volume by 2020 is expected to exceed the design capacity of Wilshire Boulevard at many intersections. This will result in the worsening of levels of service (LOS) of the arterial as a whole as well as exceeding the volume/capacity (V/C) at the majority of the intersections. It is expected that of the 78 signalized intersections that were analyzed along the Wilshire BRT corridor, approximately 21 percent will operate at LOS E or F.

The effects of preferential bus signal on cross traffic movement/existing traffic signal system have been considered. Priority treatment of buses at intersections holds the potential to reduce a significant source of delay in bus operations. This is accomplished through preferential bus signal treatment, which in effect keeps buses from being stalled in general traffic, while helping to maintain the bus schedule. However, such an operational mechanism may adversely affect cross traffic movement. Also, today's traffic signal control systems are tightly inter-connected in order to provide progression of general traffic through the urban grid system. Thus, bus signal priority treatments would have to be constrained to achieve modest variations within the context of maintaining a viable synchronization program.

For the alternatives that include an Exposition BRT, the BRT proposal calls for signal priority for the busway (Exposition ROW) and signal priority - but no preemption- in the street running section outside the busway (in Santa Monica and downtown Los Angeles). The partial signal prioritization that is proposed for the transit corridor may possibly increase delay for motorists crossing the corridor on the cross streets. Such impacts and delays can be minimized using the latest signal timing/synchronization technologies and vehicle detection capabilities. Nonetheless, it will still result in increased delays from vehicles unable to clear an intersection due to the shorter signal phase for cross traffic movement. This will especially be the case for locations where new traffic signals will be installed, and places where increased left and right turns across the BRT corridor from parallel streets to reach the stations and their respective park-and-ride facilities. The coordination of signals at closely spaced intervals between a parallel street and the transit corridor will also take on additional complexities that will need to be addressed.

Traffic Forecast Methodology

Traffic conditions for the horizon year of 2020 were forecast and evaluated for the No Action Alternative and for each of the alternatives. The No Action Alternative represents the projected horizon year traffic volumes in the study area in the absence of any improvements along the Mid-City/Westside Corridor project.

To estimate the more localized traffic impacts associated with each project alternative, intersection traffic volume projections for each scenario were developed using the following process:

- Development of future base traffic volumes reflecting 2000-2020 <u>background traffic growth</u>, and changes due to auto trip reduction and other shifts in traffic (elimination of left turns at intersections and at driveways) as a direct result of proposed Corridor transit service alternatives.
- Development of <u>additional peak hour auto access trips</u> to stations related to park-and-ride and kiss-and-ride (drop-off) trips.
- Development of <u>additional BRT and LRT vehicle volumes</u> at intersections along the corridor using the assumed transit headways for each project alternative.

The above process was employed because the projected 2020 vehicle trips produced directly by the highway assignment module of the MTA Model do not explicitly include the transit vehicles themselves nor the auto portion of transit-access (park-and-ride or kiss-and-ride) trips. Use of this methodology, allowed for a "true" impact analysis, which reflects both macro-level reductions and/or shifts in background traffic due to the transit service, as well as the micro-level additional local impacts created by station-access traffic and transit vehicle delays.

<u>Background Traffic Growth Factors</u>

To develop the "base" traffic volumes for the first step, a growth-factoring process was used. Traffic growth factors were calculated for the study area arterials by comparing traffic volume results from the MTA model for the base 2020 run and each of the project alternatives. These results included AM and PM peak link volumes at key intersections along the east-west corridor for the base year 1998 and forecast year 2020.

Due to a noticeable difference in traffic growth patterns in various sub-areas within the corridor, the traffic volumes for intersections were grouped in seven sub-areas, as follows:

- Subarea 1-- Santa Monica and the Los Angeles community of Sawtelle, including all streets west of Federal Avenue
- Subarea 2-- Century City, West Los Angeles, and Westwood along the Wilshire Corridor, including all streets between Federal Avenue and the Beverly Hills City Limits
- Subarea 3-- Beverly Hills on the Wilshire Corridor, including all streets from the western city limits to La Cienega Boulevard
- Subarea 4-- Mid-City area of Los Angeles along the Wilshire Corridor, including all streets east of La Cienega Boulevard up to Western Avenue
- Subarea 5-- Sepulveda Boulevard south of Olympic Boulevard, and Venice Boulevard west of Overland Avenue along the Exposition Corridor
- Subarea 6-- most of Culver City in the Exposition Corridor along Venice east of Overland Avenue, also includes the Exposition right of way west of Jefferson Boulevard
- Subarea 7-- Exposition Corridor east of the National Boulevard/Jefferson Boulevard intersection

For the Wilshire BRT alternative, Subareas 1-4 were further subdivided with Wilshire Boulevard itself as a separate subarea from the rest of the streets. This was done to properly capture the sharp decline in traffic volumes along Wilshire Boulevard due to the removed lane and the increase in volumes on parallel streets as a result of diversion from Wilshire Boulevard.

A summary of these growth factors, which are shown in Table 3.2-16. These factors were then applied to the existing 2000 intersection traffic counts to develop future background (base) volumes at each of the study intersections for each alternative. Detailed results of the growth factors for all regions can be found in the Traffic Analysis Report.

Along the Wilshire Corridor, the greatest general growth in traffic occurs in West Los Angeles and Beverly Hills. Both of these areas are high-density employment and commercial centers. The effects of traffic diversion due to the Wilshire BRT are noticeable throughout the study area, especially along the west side of the study area. The greatest general growth along the Exposition Corridor occurs in West Los Angeles. The arterial streets here are affected by their proximity to both the San Diego Freeway and the Santa Monica Freeway.

In the second step of the forecasting process, the projected base intersection volumes for each of the scenarios, except for the TSM Alternative, were adjusted by adding the station access auto traffic. This includes park-and-ride auto traffic, kiss-and-ride auto traffic, and bus and shuttle traffic consisting of feeder and line haul buses. The estimated vehicle trip generation for each of the project alternatives will be described in more detail in the subsequent sections, which discuss the impacts of each alternative. The estimated trip distributions were developed based on the location of the transportation system and the most likely routes to the stations and were reviewed and adjusted for local conditions through observations of traffic patterns and volumes.

TABLE 3.2-16
GROWTH FACTORS FOR STUDY AREA 2000-2020

	2020 No Action		TSM		Alternative 1, 1a,1b		Alternative 2		Alternative 2a		Alternative 3		Alternative 3a	
Location	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**
Santa Monica/	4.66%	4.54%	4.29%	4.71%	11.35%	9.24%	3.83%	3.93%	4.55%	4.48%	3.83%	3.93%	4.55%	4.48%
Sawtelle					(-3.12%)	(-2.04%)	(-3.12%)	(-2.04%)	(-3.12%)	(-2.04%)	(-3.12%)	(-2.04%)	(-3.12%)	(-2.04%)
West Los Angeles	9.82%	9.83%	9.89%	9.74%	13.66%	13.47%	9.15%	9.16%	9.71%	9.26%	9.15%	9.16%	9.71%	9.26%
					(-16.98%)	(-15.95%)	(-3.12%)	(-2.04%)	(-3.12%)	(-2.04%)	(-3.12%)	(-2.04%)	(-3.12%)	(-2.04%)
Beverly Hills	9.80%	10.48%	9.80%	10.52%	9.30%	9.86%	9.55%	10.41%	9.70%	10.52%	9.55%	10.41%	9.70%	10.52%
					(-6.57%)	(-2.64%)	(-3.12%)	(-2.04%)	(-3.12%)	(-2.04%)	(-3.12%)	(-2.04%)	(-3.12%)	(-2.04%)
Mid City Wilshire	5.66%	7.13%	5.79%	7.09%	7.68%	8.82%	5.39%	6.86%	5.64%	6.92%	5.39%	6.86%	5.64%	6.92%
					(-20.08%)	(-18.95%)	(-20.08%)	(-18.95%)	(-20.08%)	(-18.95%)	(-20.08%)	(-18.95%)	(-20.08%)	(-18.95%)
Sepulveda/Venice	24.60%	22.98%	24.60%	23.51%	27.13%	25.15%	22.62%	22.44%	24.41%	22.98%	22.62%	22.44%	24.41%	22.98%
Culver City	14.35%	15.18%	14.06%	15.49%	14.83%	16.00%	12.57%	14.21%	13.65%	14.56%	12.57%	14.21%	13.65%	14.56%
Exposition ROW	13.39%	13.90%	13.60%	14.08%	13.34%	14.02%	12.69%	13.36%	12.92%	16.17%	12.69%	13.36%	12.92%	16.17%

Source: MMA 2000

The multi-step methodology described above is used to evaluate the impacts of project-related traffic, as well as the effects of transit operations on signalized intersections. Mitigation of impacts to levels of insignificance based on these guidelines (e.g. reduction of delay by 5.0 seconds or more) would likely require traffic signal modifications and/or physical improvements, such as additional through or turn lanes at intersections, new traffic signals and possible road widenings.

<u>Impacts of Alternatives on Intersection Level of Service</u>

Intersection capacity analyses were performed for the 158 critical intersections within the Mid-City/ Westside Corridor study area for No Action conditions and for each of the project alternatives. The threshold of significance, adopted by the MTA in consultation with LADOT to determine when a project impact is significant, was discussed at the beginning of Section 3.2.3. This methodology is used to evaluate the impacts of project-related traffic, as well as the effects of transit operations on signalized intersections. Detailed level of service calculations and average delay for each alternative and peak hour can be found in the Traffic Analysis Report. The traffic impacts for each of the alternatives are discussed in the following pages.

a. No Action Alternative

The No Action Alternative presents projected operating conditions of study intersections in 2020 without the development of a transit project along the Corridor. The study assumed traffic signal operating specifications (cycle lengths, phases, etc.) to be generally the same as those of today. Current signal timing plans were obtained from all jurisdictions so that all potential pre-emptions at intersections would be entered into this analysis. The growth factors projected for various study area locations from 2000 to 2020 conditions, as shown in Table 3.2-16, were applied to existing peak hour turning movements at the study area intersections to develop estimated 2020 No Action traffic volumes for AM and PM peak hours.

Table 3.2-17 summarizes the results of these analyses. Review of this table shows that 40 intersections are expected to operate at level of service (LOS) E or F during one or more peak hours. This compares to 28 intersections currently (2000 conditions) operating at LOS E or worse, as discussed previously.

b. Transportation System Management (TSM) Alternative

The TSM Alternative assumes an improved bus transit system throughout the study area, mostly through increases in service frequency on existing bus lines. In contrast to the BRT/LRT Alternatives, this alternative does not have transit stations to which automobile trips are attracted in large numbers. Passengers using this improved bus service are assumed to access the buses through conventional bus stops and existing or unofficial park-and-ride facilities. Therefore, this alternative does not have the impacts of the additional station access vehicle trips. However, it accounts for the reduction of vehicle trips from the highway system as a result of any potential auto trips diverted to the improved bus services and redistribution of auto trips as a result of changes in transit services. To develop traffic volume forecasts for this alternative, growth factors in Table 3.2-16 corresponding to the TSM Alternative were used. No other adjustments were made to any part of the network for this alternative.

**TABLE 3.2-17
LOS E/F INTERSECTIONS IN 2020
NO ACTION ALTERNATIVE**

Intersection	LOS E		LOS F	
	AM	PM	AM	PM
Lincoln Blvd /Olympic Blvd	X	X		
20th Street /Colorado Ave				X
San Vicente Blvd/Federal Ave/Wilshire Blvd			X	X
Sawtelle Blvd /Olympic Blvd		X	X	
Sawtelle Blvd/I-405 Southbound			X	X
Sawtelle Blvd /Pico Blvd		X		
Sawtelle Blvd /National Blvd	X			X
Sawtelle Blvd /Palms Blvd	X			X
Sawtelle Blvd /Venice Blvd			X	X
Sepulveda Blvd /Wilshire Blvd	X			X
Sepulveda Blvd /Pico Blvd	X			X
Sepulveda Blvd /National Blvd			X	X
Sepulveda Blvd /Palms Blvd	X			X
Sepulveda Blvd /Venice Blvd			X	X
Sepulveda Blvd /Washington Pl		X		
Veteran Ave /Wilshire Blvd			X	X
Westwood Blvd/Santa Monica Blvd			X	X
Glendon Ave /Wilshire Blvd			X	X
Ave of the Stars /Santa Monica Blvd		X		
Santa Monica Blvd/Wilshire Blvd			X	X
S Santa Monica Blvd/Wilshire Blvd			X	X
Beverly Dr /Wilshire Blvd		X	X	
Doheny Dr /Olympic Blvd		X		
Hauser Blvd /6th Street		X		
Highland Ave /6th Street	X			
Highland Ave /Wilshire Blvd	X			
Highland Ave /Olympic Blvd			X	X
Rossmore Ave /Wilshire Blvd		X	X	
Washington Blvd /Washington Pl			X	X
Motor Ave /Venice Blvd	X	X		
Culver Blvd/Main St/Washington Blvd			X	X
Culver Blvd /Venice Blvd	X			X
Robertson Blvd /Venice Blvd			X	X
National Blvd /Venice Blvd			X	X
La Cienega Blvd /Jefferson Blvd	X			X
La Brea Ave /Exposition Blvd	X	X		
Arlington Ave /Exposition Blvd		X	X	
Western Ave /Exposition Blvd			X	
Vermont Ave /Exposition Blvd			X	
Figueroa Street /Adams Blvd		X		

Source: MMA 2000

Table 3.2-18 shows 46 intersections projected to operate at LOS E or worse during the peak hours, of which most are expected to operate slightly worse than the No Action Alternative according to the defined significance thresholds. The TSM alternative was in part based on the Westside Transit Restructuring Study, which assumed removal, streamlining, and modifications to several less productive bus lines. Many of these less productive bus lines are centered around Sawtelle Boulevard and Venice Boulevard, where most of the impacted intersections are located. Overall, most of the 158 intersections experience a slight improvement of operations.

TABLE 3.2-18
LOS E/F AND SIGNIFICANTLY IMPACTED INTERSECTIONS
TSM ALTERNATIVE

Intersection	LOS E		LOS F		Impact
	AM	PM	AM	PM	
Lincoln Blvd /Olympic Blvd	X			X	Y
20th Street /Colorado Ave				X	Y
San Vicente Blvd/Federal Ave/Wilshire Blvd			X	X	Y
Sawtelle Blvd /Olympic Blvd		X	X		Y
Sawtelle Blvd /I-405 Southbound			X	X	Y
Sawtelle Blvd /Pico Blvd		X			Y
Sawtelle Blvd /National Blvd	X			X	Y
Sawtelle Blvd /Palms Blvd	X			X	Y
Sawtelle Blvd /Venice Blvd			X	X	Y
Sepulveda Blvd /Wilshire Blvd	X			X	Y
Sepulveda Blvd /Pico Blvd	X			X	Y
Sepulveda Blvd /National Blvd			X	X	Y
Sepulveda Blvd /Palms Blvd	X			X	Y
Sepulveda Blvd /Venice Blvd			X	X	Y
Sepulveda Blvd /Washington Pl		X			Y
Veteran Ave /Wilshire Blvd			X	X	Y
Westwood Blvd /Wilshire Blvd	X				Y
Westwood Blvd/Santa Monica Blvd				X	Y
Glendon Ave /Wilshire Blvd			X	X	Y
Ave of Stars /Santa Monica Blvd		X			Y
Whittier Dr /Wilshire Blvd		X			Y
Santa Monica Blvd /Wilshire Blvd			X	X	Y
S Santa Monica Blvd/Wilshire Blvd			X	X	Y
Spalding Dr /Olympic Blvd		X			Y
Beverly Dr /Wilshire Blvd	X	X			Y
Doheny Dr /Olympic Blvd		X			Y
Fairfax Ave /3rd Street		X			Y
Hauser Blvd /6th Street				X	Y
Highland Ave /6th Street	X				N
Highland Ave /Wilshire Blvd	X				N
Highland Ave /Olympic Blvd			X	X	Y
Rossmore Ave /Wilshire Blvd		X	X		Y
Washington Blvd /Washington Pl			X	X	Y
Motor Ave /Venice Blvd	X	X			Y

TABLE 3.2-18 LOS E/F AND SIGNIFICANTLY IMPACTED INTERSECTIONS TSM ALTERNATIVE					
	LOS E		LOS F		
Intersection	**AM**	**PM**	**AM**	**PM**	**Impact**
Culver Blvd/Main St/Washington Blvd			X	X	Y
Culver Blvd /Venice Blvd	X			X	Y
Robertson Blvd /Venice Blvd			X	X	Y
National Blvd /Venice Blvd			X	X	Y
National Blvd /Washington Blvd		X			Y
La Cienega Blvd /Jefferson Blvd	X			X	Y
La Brea Ave /Exposition Blvd			X	X	Y
Arlington Ave /Exposition Blvd		X	X		Y
Western Ave /Exposition Blvd			X		Y
Vermont Ave /Exposition Blvd			X		Y
Figueroa Street /Adams Blvd				X	Y
Figueroa Street /Exposition Blvd		X			Y
Source: MMA 2000					

c. Wilshire BRT Alternative 1- Bus Lanes in Median

As described in detail in the project description, this alternative assumes operation of buses within exclusive bus lanes in the median along Wilshire Boulevard between Ocean Avenue in Santa Monica to Western Avenue in Mid City Los Angeles. On Ocean Avenue, the buses would operate on street to the Santa Monica Transit Center.

Auto access trips for each BRT station were developed from mode of access data derived from the MTA model. Daily ridership and auto trips were calculated for each station and assigned to the roadway network. Wilshire BRT has no park-and-ride lots, so all auto trips are kiss-and-ride, which are counted twice in the intersection analysis. Daily trip generation for each station is summarized in Table 3.2-19.

TABLE 3.2-19 AUTO TRIP GENERATION WILSHIRE BRT ALTERNATIVE			
Wilshire BRT Station	**Total**	**Mode Choice**	
		Walk/Bus	**Auto**
Wilshire/4th	1,202	1,134	68
Wilshire/14th	3,011	2,825	186
Bundy	2,481	2,357	124
Barrington	1,599	1,449	150
Westwood Village	6,316	5,625	691
Santa Monica	2,317	2,174	143
Beverly	1,599	1,497	102
Robertson	2,062	1,947	115
La Cienega	2,525	2,349	176
Fairfax	2,550	2,378	172

TABLE 3.2-19
AUTO TRIP GENERATION
WILSHIRE BRT ALTERNATIVE

Wilshire BRT Station	Total	Mode Choice	
		Walk/Bus	Auto
La Brea	3,052	2,899	153
Crenshaw	1,373	1,306	67
Western	9,510	9,469	41
Totals	**39,597**	**37,409**	**2,188**

Source: MMA 2000

Station access traffic was distributed to the roadway system for each station area based on travel demand model trip distribution characteristics and probable travel patterns based on major origin-destination patterns. The resulting station access traffic volume turning movements at study area intersections were added to the 2020 background traffic volumes specifically developed for the Wilshire BRT Alternative using the arterial growth factors discussed earlier.

Detailed discussions were held with the Cities of Beverly Hills, Santa Monica, and Los Angeles Department of Transportation staff to identify the likely traffic signal operational characteristics and scenarios for the implementation of the BRT system. Issues such as signal priority, cycle and phasing modifications, additional protective phasing for turns, loss time and other operational details were discussed. Based on these discussions, and directions from these cities, specific signal timing as well as geometric modifications were assumed at study intersections which are along and/or immediately adjacent to the BRT alignment.

Some of the items addressed in the intersection analysis include:

- Additional clearance time for north south streets to clear traffic across the BRT alignment.
- Additional left turn phases to stop the left turning vehicles from turning across the BRT alignment.
- Other modifications to adjacent signals to account for BRT signal priority treatments.

The above operational and physical modifications were made and assumed to be part of the project for the Wilshire BRT scenario and are reflected in intersection levels of service calculations for this alternative. In addition, existing dual left turn lanes were modified at the following locations due to the limited right-of-way:

- Veteran Avenue at Wilshire Boulevard, one left-turn lane in each direction
- Gayley Avenue at Wilshire Boulevard, one left-turn lane eastbound only
- Westwood Boulevard at Wilshire Boulevard, one left-turn lane in each direction
- Glendon Avenue at Wilshire Boulevard, both left-turn lanes eastbound only
- Santa Monica Boulevard at Wilshire Boulevard, one left-turn lane eastbound only

Intersection capacity analyses were performed for the resultant total volumes for this alternative. Table 3.2-20 summarizes the results of the intersection capacity analyses of study intersections, using Level of Service E as the threshold for intersections with unacceptable levels of service. As discussed earlier, the loss of some left turn lanes resulted in the diversion of existing left turns to alternate locations. In the level of service analysis this was manually reflected by assuming that 50 percent of the left turns would shift to the next available left turn location and 50 percent would shift to right turns and circle the next block. The diversion of some of these left turns to minor streets between the study intersections could cause impacts at some of those locations, which will be further evaluated during the design of the left turn lanes at each signalized intersection during preliminary engineering. The increased left turn demands at some of the minor streets would not negatively impact BRT operations, but it could have the potential impact of left turn queues exceeding left turn lane capacity and causing blockage of a through lane on Wilshire Boulevard.

TABLE 3.2-20
LOS E/F AND SIGNIFICANTLY IMPACTED INTERSECTIONS
WILSHIRE BRT ALTERNATIVE 1

Intersection	LOS E		LOS F		Impact
	AM	PM	AM	PM	
Bundy Dr /Wilshire Blvd		X			Y
San Vicente Blvd/Federal Ave/Wilshire Blvd			X	X	Y
Sepulveda Blvd /Wilshire Blvd	X			X	Y
Veteran Ave /Wilshire Blvd			X	X	Y
Westwood Blvd /Wilshire Blvd			X	X	Y
Westwood Blvd/Santa Monica Blvd				X	Y
Ave of the Stars /Santa Monica Blvd		X			N
Whittier Dr /Wilshire Blvd		X			Y
Santa Monica Blvd /Wilshire Blvd			X	X	Y
S Santa Monica Blvd/Wilshire Blvd		X	X		N
Spalding Dr /Olympic Blvd		X			Y
Beverly Dr /Wilshire Blvd				X	Y
Doheny Dr /Olympic Blvd		X			N
La Cienega Blvd /Wilshire Blvd		X			Y
Fairfax Ave /3rd Street		X			N
Hauser Blvd /6th Street				X	Y
Highland Ave /6th Street	X				Y
Highland Ave /Wilshire Blvd		X			Y
Highland Ave /Olympic Blvd			X	X	N
Rossmore Ave /Wilshire Blvd			X		N

Source: MMA 2000

For the Wilshire BRT Alternative, 20 intersections are projected to operate at LOS E or worse during the peak hours in the Wilshire Boulevard Corridor area. Based on a comparison to No-Build conditions, using the significant impact criteria, it can be seen that the Wilshire BRT Alternative can be expected to significantly affect 14 intersections. Mitigation efforts for these intersections will be discussed in Section 3.2.4. Table 3.2-20 indicates the intersections projected to operate at LOS E or

F and which are significantly impacted by the BRT Alternative. Figure 3.2-17 illustrates the intersections impacted by Alternative 1.

Figure 3.2.17 – Alt 1 Impacted Intersections

As seen in Table 3.2-20, most of the impacted intersections are concentrated along Wilshire Boulevard. The bulk of the impacts occur in the Westwood area and in Beverly Hills.

d. Wilshire BRT Alternative 1A- Bus Lanes Adjacent to Median

As described in detail in the project description, this alternative assumes operation of buses within exclusive bus lanes in the existing travel lane next to the median along Wilshire Boulevard between Ocean Avenue in Santa Monica to Western Avenue in Mid City Los Angeles. On Ocean Avenue, the buses would operate on street to the Santa Monica Transit Center.

Auto access trips for each BRT station were developed from mode of access data derived from the MTA model. Daily ridership and auto trips were calculated for each station and assigned to the roadway network. Wilshire BRT has no park-and-ride lots, so all auto trips are kiss-and-ride, which are counted twice in the intersection analysis. Daily trip generation for each station is summarized earlier in Table 3.2-19. It is assumed that the ridership numbers will not change as a result of the variation of the Wilshire BRT alternative.

Station access traffic was distributed to the roadway system for each station area based on travel demand model trip distribution characteristics and probable travel patterns based on major origin-destination patterns. The resulting station access traffic volume turning movements at study area intersections were added to the 2020 background traffic volumes specifically developed for the Wilshire BRT Alternative using the arterial growth factors discussed earlier. The growth factors are assumed to be similar in all Wilshire BRT alternatives because these alternatives are operational changes that should not affect traffic across the study area.Detailed discussions were held with the Cities of Beverly Hills, Santa Monica, and Los Angeles Department of Transportation staff to identify the likely traffic signal operational characteristics and scenarios for the implementation of the BRT system. Issues such as signal priority, cycle and phasing modifications, additional protective phasing for turns, loss time and other operational details were discussed. Based on these discussions, and directions from these cities, specific signal timing as well as geometric modifications were assumed at study intersections which are along and/or immediately adjacent to the BRT alignment.

Some of the items addressed in the intersection analysis include:

- Additional clearance time for north south streets to clear traffic across the BRT alignment.
- Additional left turn phases to stop the left turning vehicles from turning across the BRT alignment.
- Other modifications to adjacent signals to account for BRT signal priority treatments.

The above operational and physical modifications were made and assumed to be part of the project for the Wilshire BRT scenario and are reflected in intersection levels of service calculations for this alternative.

Intersection capacity analyses were performed for the resultant total volumes for this alternative. Table 3.2-21 summarizes the results of the intersection capacity analyses of study intersections, using Level of Service E as the threshold for intersections with unacceptable levels of service.

TABLE 3.2-21
LOS E/F AND SIGNIFICANTLY IMPACTED INTERSECTIONS
WILSHIRE BRT ALTERNATIVE 1A

Intersection	LOS E		LOS F		Impact
	AM	PM	AM	PM	
San Vicente Blvd/Federal Ave/Wilshire Blvd			X	X	Y
Sepulveda Blvd /Wilshire Blvd			X	X	Y
Veteran Ave /Wilshire Blvd			X	X	Y
Gayley Ave /Wilshire Blvd				X	Y
Westwood Blvd /Wilshire Blvd		X	X		Y
Westwood Blvd/Santa Monica Blvd				X	Y
Glendon Ave /Wilshire Blvd				X	N
Ave of the Stars /Santa Monica Blvd	X				N
Whittier Dr /Wilshire Blvd	X			X	Y
Santa Monica Blvd /Wilshire Blvd			X	X	N
S Santa Monica Blvd/Wilshire Blvd			X	X	Y
Spalding Dr /Olympic Blvd				X	Y
Beverly Dr /Wilshire Blvd		X			N
Doheny Dr /Olympic Blvd		X			N
La Cienega Blvd /Wilshire Blvd		X			Y
Fairfax Ave /3rd Street		X			N
Hauser Blvd /6th Street				X	Y
Highland Ave /6th Street	X				Y
Highland Ave /Wilshire Blvd	X				Y
Highland Ave /Olympic Blvd			X	X	N
Rossmore Ave /Wilshire Blvd	X				N

Source: MMA 2000

For the Wilshire BRT Alternative 1A, 21 intersections are projected to operate at LOS E or worse during the peak hours in the Wilshire Boulevard Corridor area. Based on a comparison to No-Build conditions, using the significant impact criteria, it can be seen that the Wilshire BRT Alternative can be expected to significantly affect 13 intersections. Mitigation efforts for these intersections will be discussed in Section 3.2.4. Table 3.2-21 indicates the intersections projected to operate at LOS E or F and which are significantly impacted by the BRT Alternative.

As seen in Table 3.2-21, most of the impacted intersections are concentrated along Wilshire Boulevard. The bulk of the impacts occur in the Westwood area and in Beverly Hills, similar to Alternative 1.

In addition to the overall level of service at each study intersection, an analysis of the left-turn queues along Wilshire Boulevard was also conducted. The potential for left-turn queues to block the BRT lane is a concern that could make this alternative unattractive in terms of bus operations improvement. Table 3.2-22 illustrates the forecast left-turn queues along Wilshire Boulevard for both Alternatives 1 and 1a.

TABLE 3.2-22
DESIGN QUEUE FOR LEFT TURN APPROACHES FOR WILSHIRE BOULEVARD

	AM Peak				PM Peak			
	Alt 1		Alt 1A		Alt 1		Alt 1a	
Intersection	EB	WB	EB	WB	EB	WB	EB	WB
2nd Street/Wilshire Blvd	*	5	0	2	*	6	0	3
5th Street/Wilshire Blvd	*	*	0	0	*	*	0	3
6th Street/Wilshire Blvd	1	1	0	1	3	6	1	3
Lincoln Blvd/Wilshire Blvd	1	8	0	4	1	9	0	4
14th Street/Wilshire Blvd	*	*	0	0	*	*	1	1
20th Street/Wilshire Blvd	2	6	1	3	3	4	1	2
26th Street/Wilshire Blvd	3	4	1	2	5	4	2	2
Centinela Ave/Wilshire Blvd	0	3	0	1	1	3	0	1
Bundy Dr/Wilshire Blvd	3	5	2	3	4	4	2	2
San Vicente Blvd/Federal Ave/Wilshire Blvd	2	3	3	4	2	3	3	4
Sepulveda Blvd /Wilshire Blvd	4	10	4	10	12	23	12	24
Veteran Ave /Wilshire Blvd	34	8	34	8	26	9	26	9
Gayley Ave /Wilshire Blvd	26	5	27	2	24	4	24	2
Westwood Blvd /Wilshire Blvd	50	12	47	12	21	14	20	14
Glendon Ave /Wilshire Blvd	*	8	21	2	*	5	11	3
Westholme Ave /Wilshire Blvd	*	2	3	2	*	4	2	4
Beverly Glen Blvd /Wilshire Blvd	6	3	6	3	10	5	10	5
Comstock Ave /Wilshire Blvd	3	1	0	1	2	2	1	1
Whittier Dr /Wilshire Blvd	8	2	8	2	11	3	11	3
Santa Monica Blvd /Wilshire Blvd	37	11	37	11	44	9	36	9
South Santa Monica Blvd/Wilshire Blvd	*	8	0	8	*	9	7	9
Beverly Dr /Wilshire Blvd	4	7	4	7	7	11	7	11
Doheny Dr/Wilshire Blvd	6	5	6	5	7	5	7	5
Robertson Blvd/Wilshire Blvd	6	4	6	4	7	8	7	8
La Cienega Blvd /Wilshire Blvd	4	6	4	6	10	12	10	12
San Vicente Blvd/Wilshire Blvd	3	1	2	0	4	2	2	1
Crescent Heights Blvd/Wilshire Blvd	3	4	2	2	3	3	2	2
Fairfax Ave/Wilshire Blvd	3	3	2	2	2	3	1	2
Hauser Blvd/Wilshire Blvd	2	3	1	1	3	2	1	1
La Brea Ave/Wilshire Blvd	3	4	2	3	3	4	2	3
Highland Ave /Wilshire Blvd	5	4	3	2	4	4	2	2
Rossmore Ave /Wilshire Blvd	7	1	3	1	7	1	3	0
Crenshaw Blvd /Wilshire Blvd	N/A	8	N/A	8	N/A	9	N/A	9
Western Ave /Wilshire Blvd	5	4	5	4	7	6	7	6

* - Indicates left turn movement removed for Alternative 1

Source: MMA 2000

e. Wilshire BRT Alternative 1B- Bus Lanes in Curb Lane

As described in detail in the project description, this alternative assumes operation of buses within exclusive bus lanes in the curb lane along Wilshire Boulevard between Ocean Avenue in Santa Monica to Western Avenue in Mid City Los Angeles. On Ocean Avenue, the buses would operate on street to the Santa Monica Transit Center.

Auto access trips for each BRT station were developed from mode of access data derived from the MTA model. Daily ridership and auto trips were calculated for each station and assigned to the roadway network. Wilshire BRT has no park-and-ride lots, so all auto trips are kiss-and-ride, which are counted twice in the intersection analysis. Daily trip generation for each station is summarized earlier in Table 3.2-19. It is assumed that the ridership numbers will not change as a result of the variation of the Wilshire BRT alternative.

Station access traffic was distributed to the roadway system for each station area based on travel demand model trip distribution characteristics and probable travel patterns based on major origin-destination patterns. The resulting station access traffic volume turning movements at study area intersections were added to the 2020 background traffic volumes specifically developed for the Wilshire BRT Alternative using the arterial growth factors discussed earlier. The growth factors are assumed to be similar in all Wilshire BRT alternatives because these alternatives are operational changes that should not affect traffic across the study area.

Detailed discussions were held with the Cities of Beverly Hills, Santa Monica, and Los Angeles Department of Transportation staff to identify the likely traffic signal operational characteristics and scenarios for the implementation of the BRT system. Issues such as signal priority, cycle and phasing modifications, additional protective phasing for turns, loss time and other operational details were discussed. Based on these discussions, and directions from these cities, specific signal timing as well as geometric modifications were assumed at study intersections which are along and/or immediately adjacent to the BRT alignment.

Some of the items addressed in the intersection analysis include:

- Additional clearance time for north south streets to clear traffic across the BRT alignment.
- Additional left turn phases to stop the left turning vehicles from turning across the BRT alignment.
- Other modifications to adjacent signals to account for BRT signal priority treatments.

The above operational and physical modifications were made and assumed to be part of the project for the Wilshire BRT scenario and are reflected in intersection levels of service calculations for this alternative.

Intersection capacity analyses were performed for the resultant total volumes for this alternative. Table 3.2-23 summarizes the results of the intersection capacity analyses of study intersections, using Level of Service E as the threshold for intersections with unacceptable levels of service.

For the Wilshire BRT Alternative 1B, 18 intersections are projected to operate at LOS E or worse during the peak hours in the Wilshire Boulevard Corridor area. Based on a comparison to No-Build conditions, using the significant impact criteria, it can be seen that the Wilshire BRT Alternative can be expected to significantly affect 11 intersections. Mitigation efforts for these intersections will be discussed in Section 3.2.4. Table 3.2-23 indicates the intersections projected to operate at LOS E or F and which are significantly impacted by the BRT Alternative.

TABLE 3.2-23
LOS E/F AND SIGNIFICANTLY IMPACTED INTERSECTIONS
WILSHIRE BRT ALTERNATIVE 1B

Intersection	LOS E		LOS F		Impact
	AM	PM	AM	PM	
San Vicente Blvd/Federal Ave/Wilshire Blvd			X	X	Y
Sepulveda Blvd /Wilshire Blvd	X			X	Y
Veteran Ave /Wilshire Blvd			X	X	N
Gayley Ave /Wilshire Blvd				X	Y
Westwood Blvd /Wilshire Blvd	X				Y
Westwood Blvd/Santa Monica Blvd				X	Y
Glendon Ave /Wilshire Blvd			X	X	Y
Ave of the Stars /Santa Monica Blvd		X			N
Whittier Dr /Wilshire Blvd		X			Y
Santa Monica Blvd /Wilshire Blvd			X	X	N
S Santa Monica Blvd/Wilshire Blvd			X	X	Y
Spalding Dr /Olympic Blvd		X			Y
Beverly Dr /Wilshire Blvd		X			N
Doheny Dr /Olympic Blvd		X			N
La Cienega Blvd /Wilshire Blvd		X			Y
Fairfax Ave /3rd Street		X			N
Hauser Blvd /6th Street				X	Y
Highland Ave /Olympic Blvd			X	X	N

Source: MMA 2000

As seen in Table 3.2-23, most of the impacted intersections are concentrated along Wilshire Boulevard. The bulk of the impacts occur in the Westwood area and in Beverly Hills.

f. Alternative 2: Wilshire BRT and Exposition BRT (Full Length)

As described in detail in the project description, this alternative assumes operation of buses within exclusive bus lanes along Wilshire Boulevard between Ocean Avenue in Santa Monica to Western Avenue in Mid City Los Angeles. The Wilshire BRT Baseline (lanes in the median) was used for this analysis. On Ocean Avenue, the buses would operate on street to the Santa Monica Transit Center. Additionally, this alternative assumes operation of buses within the exclusive Exposition ROW between Santa Monica and Sepulveda Boulevard in the west, and Venice Boulevard and Figueroa Street/Flower Street in the east. In Santa Monica, west of 14th Street, the BRT will operate as a Rapid Bus to the Santa Monica Transit Center. The BRT will run in the median of Venice Boulevard and Sepulveda Boulevard between the two ROW portions. The BRT will also run as a Rapid Bus north on Figueroa Street and south on Flower Street to 7th Street/Flower Street.

Auto access trips for each BRT station were developed from mode of access data derived from the MTA model. Daily ridership park-and-ride and kiss-and-ride trips were calculated for each station and assigned to the roadway network. Daily trip generation for each station on the Wilshire BRT route is summarized in Table 3.2-24 and daily trip generation for each station on the Exposition BRT route is summarized in Table 3.2-25.

**TABLE 3.2-24
AUTO TRIP GENERATION
ALTERNATIVE 2 WILSHIRE BRT STATIONS**

Wilshire BRT Station	Total	Mode Choice	
		Walk/Bus	Auto
Wilshire/4th	1,244	1,160	84
Wilshire/14th	2,299	2,184	115
Bundy	2,296	2,181	115
Barrington	1,430	1,345	85
Westwood Village	5,798	5,108	690
Santa Monica	2,075	1,945	130
Beverly	1,730	1,644	86
Robertson	1,912	1,816	96
La Cienega	2,154	2,046	108
Fairfax	2,645	2,508	137
La Brea	2,671	2,537	134
Crenshaw	1,223	973	250
Western	8,881	8,437	444
Totals	**36,358**	**33,884**	**2,474**

Source: MMA 2000

**TABLE 3.2-25
AUTO TRIP GENERATION
ALTERNATIVE 2 EXPOSITION BRT STATIONS**

Exposition BRT Station	Totals	Mode of Access		Auto Access	
		Walk/Transit	Auto	PNR	KNR
Seventh/Flower	2,033	1,931	102		102
Figueroa/Pico	759	721	38		38
Figueroa/Adams	969	921	48		48
Figueroa/Jefferson	4,531	4,304	227		227
Vermont	1,880	1,786	94		94
Western	1,680	1,596	84		84
Crenshaw	4,023	3,516	507	306	201
La Brea	960	871	89	41	48
La Cienega	1,711	1,262	449	363	86
National/Hayden	405	385	20		20
Venice/Main	655	622	33		33
Venice/Overland	673	639	34		34
Venice/Sepulveda	2,706	2,571	135		135
Sepulveda/National	584	555	29		29
Pico/Sawtelle	1,383	1,127	256	187	69
Bundy	1,266	1,167	99	36	63
Cloverfield	1,650	1,515	135	53	82
Colorado/14th	375	356	19		19
Ocean/Santa Monica Boulevard	718	682	36		36
Totals	**28,961**	**26,527**	**2,434**	**986**	**1,448**

Source: MMA 2000

Station access traffic was distributed to the roadway system for each station area based on travel demand model trip distribution characteristics and probable travel patterns based on major origin-destination patterns. The resulting station access traffic volume turning movements at study area intersections were added to the 2020 background traffic volumes specifically developed for Alternative 2 using the arterial growth factors discussed in previous sections.

Detailed discussions were held with Beverly Hills, Culver City, Santa Monica, and Los Angeles Department of Transportation staff to identify the likely traffic signal operational characteristics and scenarios for the implementation of the Wilshire BRT and Exposition BRT systems. Issues such as signal priority, cycle and phasing modifications, additional protective phasing for turns, loss time and other operational details were discussed. Based on these discussions, and directions from these cities, specific signal timing as well as geometric modifications were assumed at study intersections which are along and/or immediately adjacent to the BRT alignments. These include items such as:

- Additional clearance time for streets to clear traffic across the BRT alignments.
- Additional left and right turn phases to stop the turning vehicles from turning across the BRT alignments.
- Other modifications to adjacent signals to account for BRT signal priority treatments.

The above operational and physical modifications were made and assumed to be part of the project for Alternative 2 and are reflected in intersection levels of service calculations for this alternative. In addition to the locations with dual left-turn lanes that were affected by Alternative 1, one westbound left-turn lane will be eliminated at the intersection of Culver Boulevard and Venice Boulevard.

For Alternative 2, a review of Table 3.2-26 on the next page shows 49 intersections are projected to operate at LOS E or worse during the peak hours along both corridors. Based on a comparison to No-Build conditions, using the significant impact criteria, it can be seen that Alternative 2 can be expected to significantly affect 36 intersections. Table 3.2-26 indicates the intersections projected to operate at LOS E or F and which are significantly impacted by Alternative 2. These locations are illustrated on Figure 3.2-18.

Based on Table 3.2-26, most of the significantly impacted intersections are concentrated in Culver City and along Interstate 405 and on Wilshire Boulevard in the Westwood area. Also, most intersections immediately adjacent to stations experience significant impacts. This can be attributed to the large number of projected auto access trips to the two BRT alignments. Additionally, it could be partially attributed to the large number of intersections that are already at LOS E or F with the No Action Alternative.

g. Wilshire BRT and Exposition BRT (MOS) Alternative 2A

As described in detail in the project description, this alternative assumes operation of buses within exclusive bus lanes along Wilshire Boulevard between Ocean Avenue in Santa Monica to Western Avenue in Mid City Los Angeles. The Wilshire BRT Baseline (lanes in the median) was used for this analysis. On Ocean Avenue, the buses would operate on street to the Santa Monica Transit Center. Additionally, this alternative assumes operation of buses within the exclusive Exposition ROW between Venice Boulevard in Culver City and Figueroa Street/Flower Street in Downtown Los Angeles. West of Venice Boulevard/Robertson Boulevard in Culver City, the BRT will operate as a Rapid Bus to the Santa Monica Transit Center following the path of the full length Exposition BRT. The BRT will also run as a Rapid Bus north of Exposition Boulevard running to 7th Street/Flower Street northbound on Figueroa Street and southbound on Flower Street.

Figure 3.2.18 Alt 2 Impacted Intersections

TABLE 3.2-26 LOS E/F AND SIGNIFICANTLY IMPACTED INTERSECTIONS WILSHIRE BRT/EXPOSITION BRT ALTERNATIVE					
	LOS E		LOS F		
Intersection	AM	PM	AM	PM	Impact
Lincoln Blvd /Olympic Blvd	X	X			N
20th Street /Colorado Ave				X	N
Bundy Dr /Wilshire Blvd	X				Y
San Vicente Blvd/Federal Ave/Wilshire Blvd			X	X	Y
Sawtelle Blvd /Olympic Blvd		X	X		Y
Sawtelle Blvd /I-405 Southbound			X	X	Y
Sawtelle Blvd /Pico Blvd	X			X	Y
Sawtelle Blvd /National Blvd			X	X	Y
Sawtelle Blvd /Palms Blvd	X			X	Y
Sawtelle Blvd /Venice Blvd			X	X	Y
Sepulveda Blvd /Wilshire Blvd	X			X	Y
Sepulveda Blvd /Pico Blvd	X			X	Y
Sepulveda Blvd /National Blvd			X	X	Y
Sepulveda Blvd /Palms Blvd	X			X	Y
Sepulveda Blvd /Venice Blvd			X	X	Y
Sepulveda Blvd /Washington Pl		X			Y
Veteran Ave /Wilshire Blvd			X	X	Y
Westwood Blvd /Wilshire Blvd		X	X		Y
Westwood Blvd/Santa Monica Blvd				X	Y
Ave of Stars /Santa Monica Blvd				X	N
Whittier Dr /Wilshire Blvd		X			Y
Santa Monica Blvd /Wilshire Blvd			X	X	N
S Santa Monica Blvd/Wilshire Blvd			X		N
Spalding Dr /Olympic Blvd		X			Y
Beverly Dr /Wilshire Blvd		X			N
Doheny Dr /Olympic Blvd		X			N
La Cienega Blvd /Wilshire Blvd		X			Y
Fairfax Ave /3rd Street		X			N
Hauser Blvd /6th Street				X	Y
Highland Ave /6th Street	X				Y
Highland Ave /Olympic Blvd			X	X	N
Rossmore Ave /Wilshire Blvd					N
Washington Blvd /Washington Pl			X	X	Y
Girard Ave /Venice Blvd				X	Y
Overland Ave /Venice Blvd		X			Y
Motor Ave /Venice Blvd			X	X	Y
Clarington Ave /Venice Blvd		X			Y
Hughes Ave /Venice Blvd		X			Y
Culver Blvd/Main St/Washington Blvd			X	X	N
Robertson Blvd /Venice Blvd			X	X	N
National Blvd /Venice Blvd			X	X	Y

TABLE 3.2-26
LOS E/F AND SIGNIFICANTLY IMPACTED INTERSECTIONS
WILSHIRE BRT/EXPOSITION BRT ALTERNATIVE

Intersection	LOS E		LOS F		Impact
	AM	PM	AM	PM	
National Blvd /Washington Blvd		X			Y
La Cienega Blvd /Jefferson Blvd				X	Y
La Brea Ave /Exposition Blvd			X	X	Y
Arlington Ave /Exposition Blvd			X	X	Y
Western Ave /Exposition Blvd	X				N
Vermont Ave /Exposition Blvd		X	X		Y
Figueroa Street /Adams Blvd				X	Y
Figueroa Street/Jefferson Blvd		X			Y

Source: MMA 2000

Auto access trips for each BRT station were developed from mode of access data derived from the MTA model. Daily ridership park-and-ride and kiss-and-ride trips were calculated for each station and assigned to the roadway network. Daily trip generation for each station on the Wilshire BRT route is summarized in Table 3.2-27 and daily trip generation for each station on the Exposition BRT route is summarized in Table 3.2-28.

TABLE 3.2-27
AUTO TRIP GENERATION
ALTERNATIVE 2A WILSHIRE BRT STATIONS

Wilshire BRT Station	Total	Mode Choice	
		Walk/Bus	Auto
Wilshire/4th	1,228	1,153	75
Wilshire/14th	2,679	2,498	181
Bundy	2,070	1,948	122
Barrington	1,453	1,299	154
Westwood Village	6,206	5,522	684
Santa Monica	1,662	1,523	139
Beverly	1,465	1,371	94
Robertson	1,816	1,709	107
La Cienega	2,298	2,146	152
Fairfax	2,650	2,500	150
La Brea	2,664	2,520	144
Crenshaw	1,219	969	250
Western	8,980	8,856	124
Totals	**36,390**	**34,014**	**2,376**

Source: MMA 2000

TABLE 3.2-28
AUTO TRIP GENERATION
ALTERNATIVE 2A EXPOSITION BRT MOS STATIONS

Exposition BRT Station	Totals	Mode of Access		Auto Access	
		Walk/Transit	Auto	PNR	KNR
Seventh/Flower	2,158	2,050	108		108
Figueroa/Pico	768	730	38		38
Figueroa/Adams	988	939	49		49
Figueroa/Jefferson	3,332	3,153	179		179
Vermont	2,299	2,184	115		115
Western	2,075	1,971	104		104
Crenshaw	3,422	3,086	336	165	171
La Brea	1,206	1,105	101	41	60
La Cienega	2,070	1,603	467	363	104
National/Hayden	593	563	30		30
Totals	**18,911**	**17,384**	**1,527**	**569**	**958**

Source: MMA 2000

Station access traffic was distributed to the roadway system for each station area based on travel demand model trip distribution characteristics and probable travel patterns based on major origin-destination patterns. The resulting station access traffic volume turning movements at study area intersections were added to the 2020 background traffic volumes specifically developed for Alternative 2A using the arterial growth factors discussed in previous sections.

Detailed discussions were held with Beverly Hills, Culver City, Santa Monica, and Los Angeles Department of Transportation staff to identify the likely traffic signal operational characteristics and scenarios for the implementation of the Wilshire BRT and Exposition BRT MOS systems. Issues such as signal priority, cycle and phasing modifications, additional protective phasing for turns, loss time and other operational details were discussed. Based on these discussions, and directions from these cities, specific signal timing as well as geometric modifications were assumed at study intersections which are along and/or immediately adjacent to the BRT alignments. These include items such as:

- Additional clearance time for streets to clear traffic across the BRT alignments.
- Additional left and right turn phases to stop the turning vehicles from turning across the BRT alignments.
- Other modifications to adjacent signals to account for BRT signal priority treatments.

The above operational and physical modifications were made and assumed to be part of the project for Alternative 2A and are reflected in intersection levels of service calculations for this alternative. All locations where dual left-turn lanes were affected in Alternative 1 were also affected under Alternative 2A.

For Alternative 2A, a review of Table 3.2-29 on the next page shows 47 intersections are projected to operate at LOS E or worse during the peak hours along both corridors. Based on a comparison to No-Build conditions, using the significant impact criteria, it can be seen that Alternative 2 can be expected to significantly affect 33 intersections. Table 3.2-29 indicates the intersections projected to operate at LOS E or F and which are significantly impacted by Alternative 2A.

Based on Table 3.2-29, most of the significantly impacted intersections are concentrated in Culver City and along Interstate 405 and along Wilshire Boulevard in the Westwood area. Also, most intersections immediately adjacent to stations experience significant impacts. This can be attributed to the large number of projected auto access trips to the two BRT alignments. Additionally, it could be partially attributed to the large number of intersections that are already at LOS E or F with the No Action Alternative.

TABLE 3.2-29
LOS E/F AND SIGNIFICANTLY IMPACTED INTERSECTIONS
WILSHIRE BRT/EXPOSITION BRT MOS ALTERNATIVE

Intersection	LOS E		LOS F		Impact
	AM	PM	AM	PM	
Lincoln Blvd /Olympic Blvd	X			X	Y
20th Street /Colorado Ave				X	Y
Bundy Dr /Wilshire Blvd	X				Y
San Vicente Blvd/Federal Ave/Wilshire Blvd			X	X	Y
Sawtelle Blvd /Olympic Blvd		X	X		Y
Sawtelle Blvd /I-405 Southbound			X	X	Y
Sawtelle Blvd /Pico Blvd		X			N
Sawtelle Blvd /National Blvd			X	X	Y
Sawtelle Blvd /Palms Blvd	X			X	Y
Sawtelle Blvd /Venice Blvd			X	X	Y
Sepulveda Blvd /Wilshire Blvd	X			X	Y
Sepulveda Blvd /Santa Monica Blvd	X	X			Y
Sepulveda Blvd /Olympic Blvd		X			Y
Sepulveda Blvd /Pico Blvd	X			X	Y
Sepulveda Blvd /National Blvd			X	X	Y
Sepulveda Blvd /Palms Blvd	X			X	Y
Sepulveda Blvd /Venice Blvd			X	X	Y
Sepulveda Blvd /Washington Pl		X			Y
Veteran Ave /Wilshire Blvd			X	X	Y
Westwood Blvd /Wilshire Blvd		X	X		Y
Westwood Blvd/Santa Monica Blvd				X	Y
Ave of Stars /Santa Monica Blvd				X	N
Whittier Dr /Wilshire Blvd		X			Y
Santa Monica Blvd /Wilshire Blvd			X	X	N
S Santa Monica Blvd/Wilshire Blvd			X		N
Spalding Dr /Olympic Blvd		X			Y
Beverly Dr /Wilshire Blvd		X			N
Doheny Dr /Olympic Blvd		X			N
La Cienega Blvd /Wilshire Blvd		X			Y
Fairfax Ave /3rd Street		X			N
Hauser Blvd /6th Street				X	Y
Highland Ave /6th Street	X				Y

TABLE 3.2-29
LOS E/F AND SIGNIFICANTLY IMPACTED INTERSECTIONS
WILSHIRE BRT/EXPOSITION BRT MOS ALTERNATIVE

Intersection	LOS E		LOS F		Impact
	AM	PM	AM	PM	
Highland Ave /Olympic Blvd			X	X	N
Rossmore Ave /Wilshire Blvd					N
Washington Blvd /Washington Pl			X	X	Y
Motor Ave /Venice Blvd	X	X			N
Culver Blvd/Main St/Washington Blvd			X	X	Y
Culver Blvd /Venice Blvd	X			X	Y
Robertson Blvd /Venice Blvd			X	X	Y
National Blvd /Venice Blvd			X	X	Y
National Blvd /Washington Blvd		X			N
La Cienega Blvd /Jefferson Blvd				X	Y
La Brea Ave /Exposition Blvd			X	X	Y
Arlington Ave /Exposition Blvd		X	X		Y
Western Ave /Exposition Blvd	X				N
Vermont Ave /Exposition Blvd			X		N
Figueroa Street /Adams Blvd		X			N

Source: MMA 2000

h. Alternative 3: Wilshire BRT and Exposition LRT (Full Length)

As described in detail in the project description, this alternative assumes the operation of buses within exclusive bus lanes in the median along Wilshire Boulevard between Ocean Avenue in Santa Monica to Western Avenue in Mid City Los Angeles. On Ocean Avenue, the buses would operate on street to the Santa Monica Transit Center. Additionally, this alternative assumes a light rail line in operation within the exclusive Exposition ROW between Ocean Avenue in Santa Monica and Sepulveda Boulevard in the west, and Venice Boulevard and Hill Street in the east. The LRT will run in the median of Venice Boulevard and Sepulveda Boulevard between the two ROW portions. The LRT will also run down the center of Hill Street to Washington Boulevard, where it will connect with the Long Beach Blue Line to the 7th Street/Metro Center station. Additionally, the light rail will run in the median and in mixed flow traffic along Olympic Boulevard in Santa Monica between Lincoln Boulevard and 20th Street.Auto access trips for each BRT and LRT station were developed from mode of access data derived from the MTA model. Daily ridership park-and-ride and kiss-and-ride trips were calculated for each station and assigned to the roadway network. Daily trip generation for each station is summarized in Table 3.2-30 for the Wilshire BRT stations and in Table 3.2-31 for the Exposition LRT stations.

TABLE 3.2-30
AUTO TRIP GENERATION
ALTERNATIVE 3 WILSHIRE BRT

Wilshire BRT Station	Total	Mode Choice	
		Walk/Bus	Auto
Wilshire/4th	1,462	1,367	95
Wilshire/14th	2,072	1,968	104
Bundy	2,424	2,303	121

TABLE 3.2-30
AUTO TRIP GENERATION
ALTERNATIVE 3 WILSHIRE BRT

Wilshire BRT Station	Total	Mode Choice	
		Walk/Bus	Auto
Barrington	1,226	1,091	135
Westwood Village	5,222	4,598	624
Santa Monica	1,824	1,681	143
Beverly	1,642	1,560	82
Robertson	1,842		92
La Cienega	2,100	1,995	105
Fairfax	2,555	2,413	142
La Brea	2,863	2,720	143
Crenshaw	1,583	1,125	458
Western	5,733	5,446	287
Totals	**32,548**	**28,267**	**2,531**

Source: MMA 2000

TABLE 3.2-31
AUTO TRIP GENERATION
ALTERNATIVE 3 EXPOSITION LRT

Exposition LRT Station	Totals	Mode of Access		Auto Access	
		Walk/Transit	Auto	PNR	KNR
Seventh/Flower	8,146	7,739	407		407
Pico/Flower	3,608	3,428	180		180
Washington/Grand	2,000	1,900	100		100
I-110/USC/Exposition Park	1,542	1,465	77		77
Vermont	2,093	1,988	105		105
Western	2,226	2,105	121		121
Crenshaw	3,327	2,761	566	400	166
La Brea	2,623	2,451	172	41	131
La Cienega	1,370	925	445	363	82
Venice/Washington	2,197	1,201	996	586	410
Venice/Overland	1,332	1,160	172		172
Venice/Sepulveda	3,393	3,223	170		170
Sepulveda/National	2,165	2,025	140		140
Pico/Sawtelle	4,776	3,975	801	562	239
Bundy	2,781	2,408	373	233	140
Cloverfield	4,214	3,381	833	622	211
Ocean/Colorado	3,646	3,362	284	100	184
Totals	**51,439**	**45,497**	**5,942**	**2,907**	**3,035**

Source: MMA 2000

Station access traffic was distributed to the roadway system for each station area based on travel demand model trip distribution characteristics and probable travel patterns based on major origin-destination patterns. The resulting station access traffic volume turning movements at study area intersections were added to the 2020 background traffic volumes specifically developed for Alternative 3 using the arterial growth factors discussed in previous sections.

Detailed discussions were held with Beverly Hills, Culver City, Santa Monica, and Los Angeles Department of Transportation staff to identify the likely traffic signal operational characteristics and scenarios for the implementation of the Wilshire BRT and Exposition LRT systems. Issues such as signal priority, cycle and phasing modifications, additional protective phasing for turns, loss time and other operational details were discussed. Based on these discussions, and directions from these cities, specific signal timing as well as geometric modifications were assumed at study intersections which are along and/or immediately adjacent to the BRT and LRT alignments. These include items such as:

- Additional clearance time for streets to clear traffic across the BRT/LRT alignments.
- Additional turn phases to stop the turning vehicles from turning across the BRT/LRT alignments.
- Other modifications to adjacent signals to account for BRT/LRT signal priority treatments.

The above operational and physical modifications were made and assumed to be part of the project for Alternative 3 and are reflected in intersection levels of service calculations for this alternative. In addition to the locations where dual left-turn lanes were affected by Alternative 1, the following locations had changes to existing dual left-turn lanes as a result of Alternative 3:

- Culver Boulevard at Venice Boulevard, one left-turn lane westbound
- Figueroa Boulevard at Exposition Boulevard, one left-turn lane eastbound

For Alternative 3, a review of Table 3.2-32 shows 36 intersections are projected to operate at LOS E or worse during the peak hours along both corridors. Based on a comparison to No-Build conditions, using the significant impact criteria, it can be seen that Alternative 3 can be expected to significantly affect 31 intersections. Table 3.2-32 indicates the intersections projected to operate at LOS E or F and which are significantly impacted by Alternative 3. These locations are illustrated in Figure 3.2-19.

Based on Table 3.2-32, most of the significantly impacted intersections are concentrated in Culver City and along Interstate 405. Also, most intersections immediately adjacent to intersections experience significant impacts. This can be attributed to the large number of projected auto access trips to the BRT and LRT stations. Additionally, it could be partially attributed to the large number of intersections that are already at LOS E or F with the No Action Alternative.

i. Alternative 3A: Wilshire BRT and Exposition LRT (MOS)

As described in detail in the project description, this alternative assumes the operation of buses within exclusive bus lanes in the median along Wilshire Boulevard between Ocean Avenue in Santa Monica to Western Avenue in Mid City Los Angeles. On Ocean Avenue, the buses would operate on street to the Santa Monica Transit Center. Additionally, this alternative assumes a light rail line in operation within the exclusive Exposition ROW between Venice Boulevard in Culver City and Hill Street in Los Angeles. The LRT will also run down the center of Hill Street to Washington

Boulevard, where it will connect with the Long Beach Blue Line to the 7th Street/Metro Center station.

Figure 3.2.19- Alternative 3 Impacted Intersections

TABLE 3.2-32
LOS E/F AND SIGNIFICANTLY IMPACTED INTERSECTIONS
WILSHIRE BRT/EXPOSITION LRT ALTERNATIVE

	LOS E		LOS F		
Intersection	**AM**	**PM**	**AM**	**PM**	**Impact**
Lincoln Blvd /Olympic Blvd	X	X			N
San Vicente Blvd/Federal Ave/Wilshire Blvd			X	X	Y
20th Street /Colorado Ave				X	N
Sawtelle Blvd /Olympic Blvd		X	X		Y
Sawtelle Blvd /I-405 Southbound			X	X	Y
Sawtelle Blvd /Pico Blvd				X	Y
Sawtelle Blvd /National Blvd			X	X	Y
Sawtelle Blvd /Palms Blvd			X	X	Y
Sawtelle Blvd /Venice Blvd			X	X	Y
Sepulveda Blvd /Wilshire Blvd	X			X	Y
Sepulveda Blvd /Pico Blvd			X	X	Y
Sepulveda Blvd /National Blvd			X	X	Y
Sepulveda Blvd /Palms Blvd	X			X	Y
Sepulveda Blvd /Venice Blvd			X	X	Y
Sepulveda Blvd /Washington Pl		X			Y
Veteran Ave /Wilshire Blvd			X	X	Y
Westwood Blvd /Wilshire Blvd		X	X		Y
Whittier Dr /Wilshire Blvd		X			Y
Spalding Dr /Olympic Blvd		X			Y
Hauser Blvd /6th Street				X	Y
Highland Ave /6th Street	X				Y
Washington Blvd /Washington Pl			X	X	Y
Girard Ave /Venice Blvd	X			X	Y
Motor Ave /Venice Blvd			X	X	Y
Clarington Ave /Venice Blvd		X			Y
Hughes Ave /Venice Blvd		X			Y
Culver Blvd /Main St, Washington			X	X	N
Culver Blvd /Venice Blvd	X	X			N
Robertson Blvd /Venice Blvd			X	X	Y
National Blvd /Venice Blvd			X	X	Y
La Cienega Blvd /Jefferson Blvd				X	Y
La Brea Ave /Exposition Blvd			X	X	Y
Arlington Ave /Exposition Blvd		X	X		Y
Western Ave /Exposition Blvd	X	X			Y
Vermont Ave /Exposition Blvd		X	X		Y
Figueroa Street /Adams Blvd		X			N
Source: MMA 2000					

Auto access trips for each BRT and LRT station were developed from mode of access data derived from the MTA model. Daily ridership park-and-ride and kiss-and-ride trips were calculated for each station and assigned to the roadway network. Daily trip generation for each station is summarized in Table 3.2-33 for the Wilshire BRT stations and in Table 3.2-34 for the Exposition LRT stations.

TABLE 3.2-33
AUTO TRIP GENERATION
ALTERNATIVE 3A WILSHIRE BRT

Wilshire BRT Station	Total	Mode Choice	
		Walk/Bus	Auto
Wilshire/4th	1,501	1,433	68
Wilshire/14th	2,778	2,711	67
Bundy	2,385	2,254	131
Barrington	1,558	1,394	164
Westwood Village	6,272	5,574	698
Santa Monica	2,043	1,943	100
Beverly	1,640	1,545	95
Robertson	1,980		102
La Cienega	2,320	2,209	111
Fairfax	2,565	2,423	142
La Brea	2,831	2,712	119
Crenshaw	1,555	1,308	247
Western	8,872	8,762	110
Totals	**38,300**	**34,268**	**2,154**

Source: MMA 2000

TABLE 3.2-34
AUTO TRIP GENERATION
ALTERNATIVE 3A EXPOSITION LRT MOS

Exposition LRT Station	Totals	Mode of Access		Auto Access	
		Walk/Transit	Auto	PNR	KNR
Seventh/Flower	6,424	6,103	321		321
Pico/Flower	2,932	2,785	147		147
Washington/Grand	1,769	1,681	88		88
I-110/USC/Exposition Park	1,382	1,313	69		69
Vermont	1,928	1,832	96		96
Western	2,023	1,917	106		106
Crenshaw	3,098	2,543	555	400	155
La Brea	2,533	2,346	187	41	146
La Cienega	1,288	853	435	363	72
Venice/Washington	3,802	2,700	1,102	612	490
Totals	**27,179**	**24,073**	**3,106**	**1,416**	**1,690**

Source: MMA 2000

Station access traffic was distributed to the roadway system for each station area based on travel demand model trip distribution characteristics and probable travel patterns based on major origin-destination patterns. The resulting station access traffic volume turning movements at study area intersections were added to the 2020 background traffic volumes specifically developed for Alternative 3A using the arterial growth factors discussed in previous sections.

Detailed discussions were held with Beverly Hills, Culver City, Santa Monica, and Los Angeles Department of Transportation staff to identify the likely traffic signal operational characteristics and scenarios for the implementation of the Wilshire BRT and Exposition LRT systems. Issues such as signal priority, cycle and phasing modifications, additional protective phasing for turns, loss time and other operational details were discussed. Based on these discussions, and directions from these cities, specific signal timing as well as geometric modifications were assumed at study intersections which are along and/or immediately adjacent to the BRT and LRT alignments. These include items such as:

- Additional clearance time for streets to clear traffic across the BRT/LRT alignments.
- Additional turn phases to stop the turning vehicles from turning across the BRT/LRT alignments.
- Other modifications to adjacent signals to account for BRT/LRT signal priority treatments.

The above operational and physical modifications were made and assumed to be part of the project for Alternative 3A and are reflected in intersection levels of service calculations for this alternative. In addition to the locations with dual left-turn lanes that were affected by Alternative 1, one eastbound left-turn lane will be eliminated at the intersection of Figueroa Boulevard and Exposition Boulevard.

For Alternative 3A, a review of Table 3.2-35 shows 41 intersections are projected to operate at LOS E or worse during the peak hours along both corridors. Based on a comparison to No-Build conditions, using the significant impact criteria, it can be seen that Alternative 3 can be expected to significantly affect 30 intersections. Table 3.2-35 indicates the intersections projected to operate at LOS E or F and which are significantly impacted by Alternative 3A.

Based on Table 3.2-35, most of the significantly impacted intersections are concentrated in Culver City and along Interstate 405. Also, most intersections immediately adjacent to intersections experience significant impacts. This can be attributed to the large number of projected auto access trips to the BRT and LRT stations. Additionally, it could be partially attributed to the large number of intersections that are already at LOS E or F with the No Action Alternative.

TABLE 3.2-35
LOS E/F AND SIGNIFICANTLY IMPACTED INTERSECTIONS
WILSHIRE BRT/EXPOSITION LRT MOS ALTERNATIVE

Intersection	LOS E		LOS F		Impact
	AM	PM	AM	PM	
Lincoln Blvd /Olympic Blvd	X	X			N
20th Street /Colorado Ave				X	N
Sawtelle Blvd /Olympic Blvd		X	X		Y
Sawtelle Blvd /I-405 Southbound			X	X	Y
Sawtelle Blvd /Pico Blvd				X	Y
Sawtelle Blvd /National Blvd			X	X	Y
Sawtelle Blvd /Palms Blvd			X	X	Y
Sawtelle Blvd /Venice Blvd			X	X	Y
Sepulveda Blvd /Pico Blvd			X	X	Y
Sepulveda Blvd /National Blvd			X	X	Y
Sepulveda Blvd /Palms Blvd	X			X	Y

TABLE 3.2-35 LOS E/F AND SIGNIFICANTLY IMPACTED INTERSECTIONS WILSHIRE BRT/EXPOSITION LRT MOS ALTERNATIVE					
	LOS E		LOS F		
Sepulveda Blvd /Venice Blvd			X	X	Y
Sepulveda Blvd /Washington Pl		X			Y
Washington Blvd /Washington Pl			X	X	Y
Girard Ave /Venice Blvd	X			X	Y
Motor Ave /Venice Blvd			X	X	Y
Clarington Ave /Venice Blvd		X			Y
Hughes Ave /Venice Blvd		X			Y
Culver Blvd/Main St/Washington Blvd			X	X	N
Culver Blvd /Venice Blvd	X	X			N
Robertson Blvd /Venice Blvd			X	X	Y
National Blvd /Venice Blvd			X	X	Y
La Cienega Blvd /Jefferson Blvd				X	Y
La Brea Ave /Exposition Blvd			X	X	Y
Arlington Ave /Exposition Blvd		X	X		Y
Western Ave /Exposition Blvd	X	X			Y
Vermont Ave /Exposition Blvd		X	X		Y
Figueroa Street /Adams Blvd		X			N
Source: MMA 2000					

Comparison of Overall Intersection Delay

To compare intersection performance in various scenarios, a weighted average delay was calculated for each alternative in each corridor by multiplying the delays by the entering vehicles for each intersection during each peak hour. The overall average delay was calculated by adding the total weighted delay for all study intersections and dividing by the grand total of entering traffic volumes at all intersection for each peak hour. This statistic is a reasonable indicator of the amount of average vehicular delay that will be experienced by motorists going through all of the study intersections, under each scenario.

Table 3.2-36 presents a summary of total weighted average delay expected at all study intersections for the Wilshire BRT scenarios. Only those intersections that were analyzed as part of the Wilshire Corridor were included in this table.

TABLE 3.2-36 COMPARISON OF OVERALL INTERSECTION DELAY (SECONDS/VEHICLE) WILSHIRE BRT ALTERNATIVE						
	No Action	**Alt 1, 1a, 1b**	**Alt 2**	**Alt 2a**	**Alt 3**	**Alt 3a**
AM Peak Average Delay	45.55	45.73	45.77	48.38	45.61	48.46
PM Peak Average Delay	46.98	46.89	47.10	48.40	46.70	47.97
Source: MMA 2000						

As can be seen in this table, the overall average delays range from approximately 46 to 48 seconds per vehicle for the AM peak, and from approximately 47 to 48 seconds per vehicle for the PM peak. The small difference combined with the large delay indicates that these intersections are equally congested in both peak hours. Conditions are projected to change slightly from the No Action Alternative. Compared with Alternative 1, the full Exposition LRT Alternative 3 improves performance on the Wilshire Corridor by decreasing delay, but the Exposition BRT and LRT MOS alternatives 2A and 3A, respectively, cause the Wilshire Corridor to operate worse. However, these changes in delay are not considered significant. The intersection delay difference between alternatives indicates that diverted traffic will spread out throughout the study area intersections causing only a marginal increase in network-wide vehicle delay due to the lane reduction along Wilshire Boulevard.

Table 3.2-37 presents a summary of total weighted average delay expected at all study intersections for the Exposition LRT and BRT scenarios. Only those intersections that were analyzed as part of the Exposition Corridor were included in this table.

TABLE 3.2-37
COMPARISON OF OVERALL INTERSECTION DELAY (SECONDS/VEHICLE)
EXPOSITION CORRIDOR ALTERNATIVES

	No Action	Alt 2	Alt 2a	Alt 3	Alt 3a
AM Peak Average Delay	65.05	71.99	72.60	66.11	73.23
PM Peak Average Delay	71.53	77.67	78.18	73.56	78.53

Source: MMA 2000

As can be seen in this table, the overall average delays are approximately 65 and 72 seconds per vehicle for AM and PM peak, respectively in the No Action alternative. The large delay indicates that these intersections are heavily congested in both peak hours. The average delay on the Exposition Corridor is worse than the Wilshire Corridor due to the heavy congestion projected in Culver City and along the San Diego Freeway where the bulk of the study intersections are located. Most of these intersections on the street running portion on Venice Boulevard and Sepulveda Boulevard will experience high delays without the Exposition alternatives. Conditions are projected to significantly worsen with the Exposition alternatives, except for Alternative 3. This can be attributed to the larger number of auto trips projected to use the Exposition alignments and the lane reduction on Venice Boulevard.

The LRT and BRT alternatives will introduce additional delays due to several reasons:

- Reductions in available green time to cross streets at the existing signals
- Delays to turning movements
- Delays at new mid-block BRT crossings where traffic previously did not stop
- Increased congestion due to additional auto trips attracted to park and ride stations

This additional average delay compared to the No Build, ranges from about 1.5 seconds for BRT in the AM peak to just over 11 seconds for the LRT Alternative in the PM peak. It should be noted that the overall average intersection delay increases by more than the 5.0 second threshold of significance for all alternatives except Exposition Alternative 3. However, since most of the intersections were projected to operate better than LOS E, the number of intersections identified as impacted will be relatively low.

3.2.4 Mitigation Measures

General Mitigation Measures and Strategies for Refinement in Preliminary Engineering

Several of the traffic signals along the two alignments have been incorporated into the City of Los Angeles Automated Traffic Surveillance and Control (ATSAC) system. The Cities of Beverly Hills, Culver City, and Santa Monica also have citywide traffic signal systems. As part of the Preliminary Engineering and Design Build phases of the project, modifications to the signal timing and phasing plans will be refined with each local jurisdiction and implemented so that the signal systems can give priority to the BRT buses or LRT trains, while minimizing impacts on arterial street traffic. Some of the considerations that will go into the detailed signal design effort include:

- Evaluation of impacts on cross traffic when considering signal preferential/priority treatment for BRT buses/LRT trains (utilizing detection system to lengthen, or shorten on the cross street, a signal phase to allow arriving bus/train to proceed through the intersection unimpeded).
- Coordination of signal phasing and timing to coincide with arriving buses/trains and stops at adjacent station platforms – e.g., red phase occurs during the time needed for passenger boarding and fare collection.
- Consideration of signal priority that can give buses a head start over the rest of the traffic (a queue jump) in areas of mixed-flow traffic. This can be accomplished by adding a signal phase that advances to a green light for the BRT bus lane prior to the other traffic lane.

<u>BRT Impact Due to Loss of Mixed Flow Lanes on Wilshire Boulevard</u>

Proposed Mitigation Measures:

The following mitigation measure is proposed to reduce the impacts of the traffic diversion caused by the loss of one mixed flow lane in each direction on Wilshire Boulevard:

- Assist the City of Los Angeles City Department of Transportation to implement the Advanced Traffic Control System (ATCS) in the Mid-City/Westside study area. A total of 433 signalized intersections in the following ATSAC project areas will be upgraded to the ATCS system: Mid-Wilshire, Wilshire-West, Westwood, West Los Angeles, and Santa Monica Freeway-Smart Corridor. Funding in the amount of $15,000 per intersection (total of $6,495,000) will be added to the project budget to finance the ATCS system in this area.
- The MTA will work with the Cities of Beverly Hills and Santa Monica to identify traffic operations improvements, similar to the ATCS system in Los Angeles, to mitigate the impacts of any diversion of traffic from Wilshire Boulevard to alternate arterial streets. In Beverly Hills, Olympic Boulevard is part of the Smart Corridor discussed earlier under the City of Los Angeles mitigation measure. Other parallel streets which could be candidates for signal system upgrade include North and South Santa Monica Boulevards and Burton Way, with about 23 traffic signals. In Santa Monica, the signal system could be upgraded on Santa Monica Boulevard and Colorado Avenue, affecting about 21 traffic signals. The cost of this mitigation measure would be $660,000.

<u>BRT Impacts due to Turn Prohibitions and/or Restrictions at Intersections</u>

Proposed Mitigation Measures:

Mitigation measures to reduce the impacts of turn prohibitions at Study Area intersections shall include the following; to the extent determined feasible during preliminary engineering:

- Increase, to the extent feasible, the length of remaining left-turn pockets to accommodate additional traffic due to the loss of numerous left-turn lanes. During preliminary engineering, conduct additional traffic counts and assess the left turn demand at minor intersections between those studied in detail in this EIR/EIS to fine tune left turn lane requirements.
- Increase the signal phase length for remaining left-turn movement locations, to the extent feasible, without negatively impacting BRT operating speeds.

<u>Traffic Re-distribution Impacts into Residential Neighborhood Mitigations</u>

Neighborhood traffic control may be typically achieved by three means:

- General devices for neighborhood traffic control and protection that convey specific controls to drivers and pedestrians alike, including stops signs, speed limit signs and speed zones, turn prohibition signs, one-way street designation, and other regulatory devices such as flashing signals, yield signs, access regulation signs, truck restrictions and parking controls.
- Geometric features of the road that physically restrict and prevent vehicle movement including chokers, traffic circles, median barriers, semi-diverters, forced-turn channelization, and cul-de-sacs at intersections or mid block. Other measures will be considered to reduce vehicle speed such as pavement undulations and dips or raised intersections.
- Complete street closures to divert traffic to alternate routes and accomplish a desired goal.

LADOT and City staffs in the Cities of Beverly Hills, Culver City, and Santa Monica shall monitor traffic conditions on residential streets adjacent to the Wilshire BRT and the Exposition LRT or BRT to determine if the project results in adverse impacts on residential streets. They shall prepare traffic mitigation programs for each impacted neighborhood in coordination with the affected residents. MTA shall include in the project budget funds to reimburse the local jurisdictions for the cost of such monitoring, outreach, and implementation for neighborhood traffic management programs. The total cost of these mitigation measures, as discussed in Section 3.2.3 is estimated at approximately $3.3 million.

Specific Intersection Improvements

As stated previously, an intersection is considered to be significantly affected if the project causes a deterioration in level of service to E or worse, and/or results in an increase in the average vehicle delay of 5.0 seconds or more at an intersection projected to operate at LOS E or worse under No-Action conditions. Using these criteria, the results indicate that mitigation measures would need to be implemented at a total ranging from 13 to 25 intersections, depending on the alternative considered.

The approach used to develop mitigation measures at affected intersections was to first consider traffic signal operational improvements such as signal timing and phasing changes before considering physical improvements. The signal cycle lengths for the study intersections were adjusted and the green times for each approach fine-tuned to satisfy the forecast traffic demands, including BRT buses/LRT trains. If that approach did not mitigate the impacts, physical improvements to the intersection were then developed. Typical recommendations considered signalization, additional turn lanes, road widening, and additional through lanes.

The following conceptual operational and/or physical intersection improvements were developed to help mitigate the residual significant traffic impacts along the two corridors for each alternative.

a. Transportation Systems Management (TSM) Alternative

All intersections determined to be significantly impacted during the initial model runs will not need physical improvements to them. Re-calibration of the signal timing enabled significant reduction in delay to the point where the intersections were no longer impacted.

b. Wilshire BRT Alternative 1

The following operational and/or geometric improvements are recommended to reduce the impacts of Alternative 1:

Bundy Drive/Wilshire Boulevard

- Add southbound protected left turn phase.
- Re-calibrate signal timing (reduced green time on Wilshire Blvd. may affect BRT operations)

Veteran Avenue/Wilshire Boulevard

- Add southbound protected left turn phase.
- Re-stripe southbound through lane to a shared through-right turn lane
- Re-calibrate signal timing.

Beverly Drive/Wilshire Boulevard

- Add southbound protected left turn phase.
- Re-calibrate signal timing.

Hauser Boulevard/6th Street

- Re-stripe northbound approach to a left turn lane and a shared through-right turn lane.
- Re-calibrate signal timing.

The following intersections were also determined to be significantly impacted during the initial model runs. Re-calibration of the signal timing enabled significant reduction in delay to the point where the intersections were no longer impacted. The recommended mitigation measure is to retime the following signals:

- Wilshire Boulevard/Federal Avenue/San Vicente Boulevard
- Sepulveda Boulevard/Wilshire Boulevard

- Westwood Boulevard/Santa Monica Boulevard
- Whittier Drive/Wilshire Boulevard
- Santa Monica Boulevard/Wilshire Boulevard
- Spalding Drive/Olympic Boulevard
- Highland Avenue/6th Street
- Highland Avenue/Wilshire Boulevard (reduced green time for Wilshire Blvd. through movements may affect BRT operations)

The following intersections have significantly unavoidable impacts since feasible operational measures considered at these intersections would not mitigate all identified impacts.

- Westwood Boulevard/Wilshire Boulevard
- La Cienega Boulevard/Wilshire Boulevard

c. Wilshire BRT Alternative 1A

The following operational and/or geometric improvements shall be implemented to reduce the impacts of Alternative 1A:

Veteran Avenue/Wilshire Boulevard

- Add southbound protected left turn phase.
- Re-stripe southbound through lane to a shared through-right turn lane
- Re-calibrate signal timing.

Hauser Boulevard/6th Street

- Re-stripe northbound approach to a left turn lane and a shared through-right turn lane.
- Re-calibrate signal timing.

The following intersections were also determined to be significantly impacted during the initial model runs. Re-calibration of the signal timing enabled significant reduction in delay to the point where the intersections were no longer impacted. The recommended mitigation measure is to retime the following signals:

- Wilshire Boulevard/Federal Avenue/San Vicente Boulevard
- Sepulveda Boulevard/Wilshire Boulevard
- Gayley Avenue/Wilshire Boulevard
- Westwood Boulevard/Santa Monica Boulevard
- Whittier Drive/Wilshire Boulevard
- South Santa Monica Boulevard/Wilshire Boulevard
- Spalding Drive/Olympic Boulevard
- Highland Avenue/6th Street

- Highland Avenue/Wilshire Boulevard

The following intersections have significantly unavoidable impacts since feasible operational measures considered at these intersections would not mitigate all identified impacts.

- Westwood Boulevard/Wilshire Boulevard
- La Cienega Boulevard/Wilshire Boulevard

d. Wilshire BRT Alternative 1B

The following operational and/or geometric improvements shall be implemented to reduce the impacts of Alternative 1B:

<u>Hauser Boulevard/6th Street</u>

- Re-stripe northbound approach to a left turn lane and a shared through-right turn lane.
- Re-calibrate signal timing.

The following intersections were also determined to be significantly impacted during the initial model runs. Re-calibration of the signal timing enabled significant reduction in delay to the point where the intersections were no longer impacted. The recommended mitigation measure is to retime the following signals:

- Wilshire Boulevard/Federal Avenue/San Vicente Boulevard
- Sepulveda Boulevard/Wilshire Boulevard
- Gayley Avenue/Wilshire Boulevard
- Westwood Boulevard/Santa Monica Boulevard
- Glendon Avenue/Wilshire Boulevard
- Whittier Drive/Wilshire Boulevard
- South Santa Monica Boulevard/Wilshire Boulevard
- Spalding Drive/Olympic Boulevard

The following intersections have significantly unavoidable impacts since feasible operational measures considered at these intersections would not mitigate all identified impacts.

- Westwood Boulevard/Wilshire Boulevard
- La Cienega Boulevard/Wilshire Boulevard

e. Alternative 2: Wilshire BRT and Exposition BRT (Full Length)

The following operational and/or geometric improvements shall be implemented to reduce the impacts of Alternative 2:

<u>Bundy Drive/Wilshire Boulevard</u>

- Add southbound protected left turn phase.

- Re-calibrate signal timing.

Veteran Avenue/Wilshire Boulevard

- Add southbound protected left turn phase.
- Re-stripe southbound through lane to a shared through-right turn lane
- Re-calibrate signal timing.

Hauser Boulevard/6th Street

- Re-stripe northbound approach to a left turn lane and a shared through-right turn lane.
- Re-calibrate signal timing.

National Boulevard/Sawtelle Boulevard

- Add an extra left turn lane southbound.
- Add an exclusive right turn lane eastbound and westbound.

Sawtelle Boulevard/Palms Boulevard

- Add southbound protected left turn phase.
- Re-calibrate signal timing.

Sawtelle Boulevard/Venice Boulevard

- Add northbound exclusive left turn lane.
- Re-calibrate signal timing.

Washington Boulevard/Washington Place

- Add protected left turn phase to westbound Washington Boulevard
- Re-calibrate signal timing.

Venice Boulevard/Motor Avenue

- Add southbound protected left turn phase.
- Re-calibrate signal timing.

Venice Boulevard/Clarington Avenue

- Add lane in northbound and southbound directions. Re-stripe approaches to have a shared through/left turn lane and a shared through/right turn lane.

Venice Boulevard/Hughes Avenue

- Add lane in northbound and southbound directions. Re-stripe approaches to have a shared through/left turn lane and a shared through/right turn lane.

Venice Boulevard/National Boulevard

- Add northbound and westbound protected left turn phases.
- Re-calibrate signal timing.

National Boulevard/Washington Boulevard

- Add northbound and southbound protected left turn phases.
- Re-calibrate signal timing.

La Cienega Boulevard/Jefferson Boulevard

- Add northbound and eastbound right turn lanes.
- Re-calibrate signal timing.

Figueroa Street/Adams Boulevard

- Add northbound protected left turn phase.
- Re-calibrate signal timing.

The following intersections were also determined to be significantly impacted during the initial model runs. Recalibration of the signal timing enabled significant reduction in delay to the point where the intersections were no longer impacted. The recommended mitigation measure is to retime the following signals:

- Wilshire Boulevard/Federal Avenue/San Vicente Boulevard
- Sepulveda Boulevard/Wilshire Boulevard
- Westwood Boulevard/Santa Monica Boulevard
- Whittier Drive/Wilshire Boulevard
- Spalding Drive/Olympic Boulevard
- Highland Avenue/6th Street
- Sawtelle Boulevard/Olympic Boulevard
- Sawtelle Boulevard/I-405 Southbound Ramps
- Sepulveda Boulevard/Pico Boulevard
- Sepulveda Boulevard/Washington Place
- Venice Boulevard/Girard Avenue
- Exposition Boulevard/La Brea Avenue
- Exposition Boulevard/Arlington Avenue
- Exposition Boulevard/Vermont Avenue
- Figueroa Street/Jefferson Boulevard

The following intersections have significantly unavoidable impacts since feasible operational measures considered at these intersections would not mitigate all identified impacts.

- **Pico Boulevard/Sawtelle Boulevard** (Can be mitigated in AM Peak with re-calibrated signal timing)
- **Sepulveda Boulevard/National Boulevard** (Can be mitigated in AM Peak with exclusive right turn lanes eastbound and westbound and re-calibrated signal timing)
- **Sepulveda Boulevard/Palms Boulevard**
- **Venice Boulevard/Sepulveda Boulevard**
- **Venice Boulevard/Overland Avenue**
- **Westwood Boulevard/Wilshire Boulevard**
- **La Cienega Boulevard/Wilshire Boulevard**

f. Wilshire BRT and Exposition BRT MOS Alternative 2A

The following operational and/or geometric improvements shall be implemented to reduce the impacts of Alternative 2A:

Bundy Drive/Wilshire Boulevard

- Add southbound protected left turn phase.
- Re-calibrate signal timing.

Veteran Avenue/Wilshire Boulevard

- Add southbound protected left turn phase.
- Re-stripe southbound through lane to a shared through-right turn lane
- Re-calibrate signal timing.

Hauser Boulevard/6th Street

- Re-stripe northbound approach to a left turn lane and a shared through-right turn lane.
- Re-calibrate signal timing.

National Boulevard/Sawtelle Boulevard

- Add an extra left turn lane southbound.
- Add an exclusive right turn lane eastbound and westbound.

Sawtelle Boulevard/Palms Boulevard

- Add southbound protected left turn phase.
- Re-calibrate signal timing.

Sawtelle Boulevard/Venice Boulevard

- Add northbound exclusive left turn lane.
- Re-calibrate signal timing.

Washington Boulevard/Washington Place

- Add protected left turn phase to westbound Washington Boulevard
- Re-calibrate signal timing.

Venice Boulevard/National Boulevard

- Add northbound and westbound protected left turn phases.
- Re-calibrate signal timing.

La Cienega Boulevard/Jefferson Boulevard

- Add northbound and eastbound right turn lanes.
- Re-calibrate signal timing.

The following intersections were also determined to be significantly impacted during the initial model runs. Recalibration of the signal timing enabled significant reduction in delay to the point where the intersections were no longer impacted. The recommended mitigation measure is to retime the following signals:

- Lincoln Boulevard/Olympic Boulevard
- 20th Street/Colorado Avenue
- Wilshire Boulevard/Federal Avenue/San Vicente Boulevard
- Sepulveda Boulevard/Wilshire Boulevard
- Sepulveda Boulevard/Santa Monica Boulevard
- Sepulveda Boulevard/Olympic Boulevard
- Westwood Boulevard/Santa Monica Boulevard
- Whittier Drive/Wilshire Boulevard
- Spalding Drive/Olympic Boulevard
- Highland Avenue/6th Street
- Sawtelle Boulevard/Olympic Boulevard
- Sawtelle Boulevard/I-405 Southbound Ramps
- Sepulveda Boulevard/Pico Boulevard
- Sepulveda Boulevard/Washington Place
- Venice Boulevard/Robertson Boulevard
- Culver Boulevard/Main St/Washington Boulevard

- Culver Boulevard/Venice Boulevard
- Exposition Boulevard/La Brea Avenue
- Exposition Boulevard/Arlington Avenue

The following intersections have significantly unavoidable impacts since feasible operational measures considered at these intersections would not mitigate all identified impacts.

- **Sepulveda Boulevard/National Boulevard** (Can be mitigated in AM Peak with exclusive right turn lanes eastbound and westbound and re-calibrated signal timing)
- **Sepulveda Boulevard/Palms Boulevard**
- **Venice Boulevard/Sepulveda Boulevard**
- **Westwood Boulevard/Wilshire Boulevard**
- **La Cienega Boulevard/Wilshire Boulevard**

g. Alternative 3: Wilshire BRT and Exposition LRT (Full Length)

The following operational and/or geometric improvements shall be implemented to reduce the impacts of Alternative 3:

Veteran Avenue/Wilshire Boulevard

- Add southbound protected left turn phase.
- Re-stripe southbound through lane to a shared through-right turn lane
- Re-calibrate signal timing.

Hauser Boulevard/6th Street

- Re-stripe northbound approach to a left turn lane and a shared through-right turn lane.
- Re-calibrate signal timing.

Pico Boulevard/Sawtelle Boulevard

- Add northbound, southbound, and westbound protected left turn phases.
- Re-calibrate signal timing.

Olympic Boulevard/Sawtelle Boulevard

- Add northbound protected left turn phase.
- Re-calibrate signal timing.

National Boulevard/Sawtelle Boulevard

- Add an extra left turn lane southbound.

Sawtelle Boulevard/Palms Boulevard

- Add southbound protected left turn phase.

- Add westbound right turn lane.
- Re-calibrate signal timing.

Venice Boulevard/Sepulveda Boulevard

- Add northbound exclusive left turn lane.
- Add northbound and southbound protected left turn phases.
- Re-calibrate signal timing.

Venice Boulevard/Motor Avenue

- Re-stripe northbound right turn lane to a shared through/right turn lane.
- Add southbound protected left turn phase.
- Add southbound right turn overlapping phase.
- Re-calibrate signal timing.

Venice Boulevard/Clarington Avenue

- Add northbound right turn lane with overlapping phase.
- Re-calibrate signal timing.

Venice Boulevard/Hughes Avenue

- Add lane in northbound and southbound directions. Re-stripe approaches to have a shared through/left turn lane and a shared through/right turn lane.

Venice Boulevard/National Boulevard

- Add northbound and westbound protected left turn phases.
- Re-calibrate signal timing.

La Cienega Boulevard/Jefferson Boulevard

- Re-stripe southbound right turn lane to a shared through/right turn lane.
- Add northbound and eastbound right turn lanes with overlapping phases.
- Re-calibrate signal timing.

The following intersections were also determined to be significantly impacted during the initial model runs. Recalibration of the signal timing enabled significant reduction in delay to the point where the intersections were no longer impacted. The recommended mitigation measure is to retime the following signals:

- Wilshire Boulevard/Federal Avenue/San Vicente Boulevard
- Sepulveda Boulevard/Wilshire Boulevard
- Whittier Drive/Wilshire Boulevard
- Spalding Drive/Olympic Boulevard

- Highland Avenue/6th Street
- Sawtelle Boulevard/I-405 Southbound Ramps
- Venice Boulevard/Sawtelle Boulevard
- Sepulveda Boulevard/Washington Place
- Washington Boulevard/Washington Place
- Venice Boulevard/Girard Avenue
- Venice Boulevard/Robertson Boulevard
- Exposition Boulevard/La Brea Avenue
- Exposition Boulevard/Arlington Avenue
- Exposition Boulevard/Western Avenue
- Exposition Boulevard/Vermont Avenue

The following intersections have significantly unavoidable impacts since feasible operational measures considered at these intersections would not mitigate all identified impacts.

- Westwood Boulevard/Wilshire Boulevard
- Pico Boulevard/Sepulveda Boulevard
- Sepulveda Boulevard/National Boulevard
- Sepulveda Boulevard/Palms Boulevard

h. Wilshire BRT and Exposition LRT MOS Alternative 3A

The following operational and/or geometric improvements shall be implemented to reduce the impacts of Alternative 3A:

<u>Veteran Avenue/Wilshire Boulevard</u>

- Add southbound protected left turn phase.
- Re-stripe southbound through lane to a shared through-right turn lane
- Re-calibrate signal timing.

<u>Hauser Boulevard/6th Street</u>

- Re-stripe northbound approach to a left turn lane and a shared through-right turn lane.
- Re-calibrate signal timing.

<u>Olympic Boulevard/Sawtelle Boulevard</u>

- Add northbound protected left turn phase.
- Re-calibrate signal timing.

Sawtelle Boulevard/Palms Boulevard

- Add southbound protected left turn phase.
- Add westbound right turn lane.
- Re-calibrate signal timing.

Venice Boulevard/Sepulveda Boulevard

- Add northbound exclusive left turn lane.
- Add northbound and southbound protected left turn phases.
- Re-calibrate signal timing.

Venice Boulevard/Motor Avenue

- Re-stripe northbound right turn lane to a shared through/right turn lane.
- Add southbound protected left turn phase.
- Add southbound right turn overlapping phase.
- Re-calibrate signal timing.

Venice Boulevard/National Boulevard

- Add northbound and westbound protected left turn phases.
- Re-calibrate signal timing.

La Cienega Boulevard/Jefferson Boulevard

- Re-stripe southbound right turn lane to a shared through/right turn lane.
- Add northbound and eastbound right turn lanes with overlapping phases.
- Re-calibrate signal timing.

The following intersections were also determined to be significantly impacted during the initial model runs. Recalibration of the signal timing enabled significant reduction in delay to the point where the intersections were no longer impacted. The recommended mitigation measure is to retime the following signals:

- Lincoln Boulevard/Olympic Boulevard
- Wilshire Boulevard/Federal Avenue/San Vicente Boulevard
- Sepulveda Boulevard/Wilshire Boulevard
- Sepulveda Boulevard/Santa Monica Boulevard
- Whittier Drive/Wilshire Boulevard
- Spalding Drive/Olympic Boulevard
- Highland Avenue/6th Street
- Sawtelle Boulevard/I-405 Southbound Ramps

- Venice Boulevard/Sawtelle Boulevard
- Sepulveda Boulevard/Washington Place
- Washington Boulevard/Washington Place
- Culver Boulevard/Venice Boulevard
- Venice Boulevard/Robertson Boulevard
- La Brea Avenue/Jefferson Boulevard
- Exposition Boulevard/La Brea Avenue
- Exposition Boulevard/Arlington Avenue
- Exposition Boulevard/Normandie Avenue
- Exposition Boulevard/Vermont Avenue

The following intersections have significantly unavoidable impacts since feasible operational measures considered at these intersections would not mitigate all identified impacts.

- Westwood Boulevard/Wilshire Boulevard
- Pico Boulevard/Sepulveda Boulevard
- Sepulveda Boulevard/National Boulevard
- Sepulveda Boulevard/Palms Boulevard

3.2.5 Cumulative Impacts

Traffic impact analyses conducted for this project, as documented throughout this report, including countywide, study area, corridor-level, screenline, or detailed intersection forecasts, are based on traffic projections developed by the LACMTA Regional Travel Demand Model. These future traffic forecasts, which represent a horizon year of 2020, are developed with consideration for population, employment and land use growth for the entire southern California area, as projected by the designated Regional Metropolitan Planning Organization (MPO), Southern California Association of Governments (SCAG). Therefore, all traffic forecasts and the corresponding impact analyses account for impacts of not only the project alternatives and the overall projected cumulative growth in the study area and the region in general.

3.3 Parking

3.3.1 Introduction

This section provides information relative to parking issues affected by the proposed Wilshire BRT and Exposition BRT/ LRT alternatives. A threshold of significance is defined in this section along with the methodology for evaluating parking-related impacts. It assesses on-street parking inventories relative to proposals for the elimination of such parking in order to accommodate the BRT/ LRT alternatives on both corridors. Additionally, it provides discussions on the need for parking facilities (park-and-ride lots) to adequately serve transit patrons attracted to the proposed high-capacity transit services. Finally, this section discusses parking management measures and parking replacement strategies designed to mitigate the impact of removing on-street parking.

3.3.2 Affected Environment

Parking Inventory

<u>On-street parking</u>

The number of on-street parking spaces along the Wilshire Boulevard BRT Corridor from Western Avenue in Los Angeles to Ocean Avenue in Santa Monica was quantified, as is presented by Table 3.3-1. Along the Exposition Corridor, on-street parking was inventoried on Venice and Sepulveda Boulevards, where the LRT or BRT alternatives would run in the street and potentially affect parking. At least five categories of on-street parking were surveyed including: metered spaces; unmetered spaces; commercial loading zones; taxi/ valet passenger loading; handicapped/ senior citizen zone; and school bus zone. The following table provides a summary of the parking spaces by the various categories that were surveyed.

TABLE 3.3-1
WILSHIRE BOULEVARD BRT CORRIDOR
REPLACEMENT PARKING BY CITY AND SEGMENT

Segment	Endpoints	Metered Spaces	Unmetered Spaces	Commercial/ Loading Zones	Taxi/Valet Passenger Loading Zones	Disabled/ Seniors	Total Spaces
Segment I - Los Angeles							
1	Western to Gramercy	45	-	-	3	-	48
2	Wilton to Norton	26	1	-	1	-	28
3	Highland to La Brea	4	20	-	-	-	24
4	Detroit to Cochran	19	14	-	-	-	33
5	Dunsmuir to Ridgeley	11	23	2	-	-	36
6	Hauser to Curson	42	-	-	-	-	42
7	Stanley to Orange Grove	56	-	-	5	-	61
8	Fairfax to San Diego	38	-	4	9	-	51
9	Crescent Heights to San Vicente	38	-	12	7	-	57
Subtotal		279	58	18	25	0	380
Segment II - Beverly Hills							
1	San Vicente to Hamilton	19	5	-	-	-	24
2	La Cienega to Willman	36	-	-	1	-	37
3	Robertson to Doheny	54	-	-	5	-	59

TABLE 3.3-1 WILSHIRE BOULEVARD BRT CORRIDOR REPLACEMENT PARKING BY CITY AND SEGMENT							
Segment	**Endpoints**	**Metered Spaces**	**Unmetered Spaces**	**Commercial/ Loading Zones**	**Taxi/Valet Passenger Loading Zones**	**Disabled/ Seniors**	**Total Spaces**
4	Oakhurst to Rexford	27	-	-	1	-	28
5	Elm to El Camino	-	-	2	5	-	7
Subtotal		136	5	2	12	0	155
Segment III - Westwood							
1	Comstock to Devon	-	29	3	1	-	33
2	Beverly Glen to Malcolm	-	57	2	18	-	77
Subtotal		0	86	5	19	0	110
Segment IV - West Los Angeles							
1	Federal to Brockton	60	-	3	1	-	64
2	Saltair to Bundy	55	-	-	6	-	61
3	Amherst to Carmelina	39	-	-	3	-	42
Subtotal		154	0	3	10	0	167
Segment IV - Santa Monica							
1	Centinelia to Berkley	45	-	-	-	-	45
2	Stanford to Princeton	66	-	-	-	-	66
3	26th to 24th	66	-	-	-	-	66
4	23rd to 21st	41	-	-	-	-	41
5	20th to 18th	49	-	-	-	-	49
6	17th to 15th	45	-	-	-	-	45
7	14th to 12th	52	-	-	1	-	53
8	11th to 9th	38	-	-	-	-	38
9	Lincoln to 6th	47	-	-	-	1	48
10	5th to 2nd	55	-	-	3	-	58
Subtotal		504	0	0	4	1	509
Grand Total		**1,073**	**149**	**28**	**70**	**1**	**1,321**

The majority of spaces on Wilshire Boulevard are metered and have time limits on length of stay. Along much of Wilshire Boulevard parking is also prohibited during peak hours. Peak hour parking prohibitions are in place along Wilshire Boulevard in the Cities of Los Angeles and Beverly Hills, but not in Santa Monica. Table 3.3.2 illustrates that most of the parking along Venice and Sepulveda Boulevards is unmetered.

TABLE 3.3-2 EXPOSITION BOULEVARD BRT / LRT CORRIDOR INVENTORY OF EXISTING ON-STREET PARKING SPACES						
Street (both directions)	**Metered Spaces**	**Unmetered Spaces**	**Commercial Loading Zones**	**Taxi/Valet Passenger Loading**	**Disabled/ Seniors**	**Total Spaces**
Venice Boulevard	114	214	1	72	1	402
Sepulveda Boulevard	-	511	2	13*		526
Total Parking	**114**	**725**	**3**	**85**	**1**	**928**
* loading zone for 13 school buses.						

<u>Off-street parking</u>

A variety of land uses exists along the entire length of both the Wilshire and Exposition corridors, including commercial, industrial, residential, recreational, and institutional. As mandated by zoning codes relative to parking requirements, these uses provide off-street parking accommodations separate from on-street parking inventories using private parking lots/structures. There were no inventory surveys conducted as part of this study relative to off-street parking facilities (both public and private). The project alternatives will not affect the quality of existing off-street parking facilities. However, the demand for off-street parking could increase in areas where the on-street parking is removed or is insufficient to accommodate new transit users who drive to their boarding stations.

3.3.3 Impact Assessment

Standards of Significance

It is difficult to develop a threshold of significance relative to parking along a given corridor that can be used to assess parking impacts from a quantitative standpoint. Such an approach is easier to discuss when evaluating the adequacy of parking for an individual building or development, rather than trying to take into account a 15-mile corridor. Local jurisdictions have the ability to regulate the use of on-street parking and to prohibit it. The loss of on-street parking may or may not affect the nearby businesses or residents, depending upon the utilization rate of the spaces being removed and the availability of alternative off-street parking or on-street parking on nearby streets. The loss of on-street parking however, is often perceived as an impact on businesses, particularly retail businesses, by the proprietors of those businesses.

Adequacy of parking can be evaluated in terms of meeting established zoning code requirements relative to parking. However, it is more difficult to assess such impacts along the two transit corridors since it is not known if all the land uses adequately provide for or meet current off-street parking requirements.

On-street parking removal along the Wilshire and Exposition Boulevard BRT/LRT Corridors will have varying degrees of impact on different sectors or groups of users of the two corridors. In some cases, the availability of off-street parking and the enhanced transit accessibility associated with the project alternatives will offset the impact of loss of on-street parking, but it can be stated that the loss of convenient on-street parking will have some impact on virtually all land uses. It is difficult to establish a quantitative threshold of significance to determine when this impact is significant. Some of the impacts manifest themselves in other areas that can only be qualitatively discussed. These areas deal with qualitative issues such as personal inconvenience, access impacts to businesses, supply of goods by delivery trucks, access issues for taxicabs/ valet services and physically challenged persons, safety concerns resulting from the removal of the parking buffer zone between the sidewalk and through traffic and the elimination of a refuge area for emergency parking, accidents and breakdowns.

Methodology for Impact Evaluation

The methodology for evaluating the impacts of removing on-street parking to accommodate the transit alternatives will consider a number of factors. The evaluation will address such issues as convenience, access, safety, business disruption, and the need for parking replacement. The evaluation will also reflect the fact that the on-street parking along Wilshire, Venice and Sepulveda Boulevards lost to the BRT or LRT operation, will be replaced with off-street parking to the extent feasible. It also reflects the fact that no new park-and-ride lots are being proposed for the Wilshire

Boulevard corridor to accommodate and attract new transit patrons. Access to the stations on the Wilshire corridor will be via transit usage (transfers) and walking. The two parking lots that may be provided along Wilshire Boulevard on property owned by the MTA would be used as replacement parking.

Parking Impacts

No Action Alternative (Baseline)

The No Action Alternative would not affect parking along either the Wilshire or Exposition Corridors. As noted earlier, the local jurisdictions have the authority to impose limitations on the use of on-street parking, so the No Action Alternative could include changes to on-street parking conditions implemented by the local jurisdictions, but such actions would be independent of the transit operations on these corridors.

Transportation System Management (TSM) Alternative

The TSM Alternative would not affect parking along either the Wilshire or Exposition Corridors. As noted earlier, the local jurisdictions have the authority to impose limitations on the use of on-street parking, so the TSM Alternative could also include changes to on-street parking conditions implemented by the local jurisdictions, but such actions would be independent of the transit operations on these corridors.

Alternative 1: Wilshire BRT (Baseline Median-Running)

Access and Convenience. The removal of on-street parking along Wilshire Boulevard will eliminate the ability of drivers to stop, park, load/unload passengers or goods directly in front of businesses and residences. Such activities will have to occur off-street in parking/loading facilities, where available, or on side streets. As mentioned earlier, a total of 1,211 parking spaces may be removed as a result of the Wilshire BRT project. Along Wilshire Boulevard alone, the proposed project will eliminate the option of short-term parking at 1,073 metered and 149 unmetered parking spaces that currently service primarily businesses along this high activity and high-density residential corridor. The loss of 28 on-street commercial loading zones, in addition to the general parking spaces, will reduce the ability of businesses to conveniently load/unload goods at the curb. This will be problematic for businesses that do not have off-street loading facilities and could cause traffic congestion if the delivery vehicles stop at the curb and block a travel lane. The loss of 70 spaces currently designated for taxis, shuttles and other valet services will further inconvenience hotel guests and restaurant patrons along this route. It will also create additional hardship on handicapped persons who depend on such convenient handicapped designated parking spots to access their destinations.

It should be noted that along much of the Wilshire Corridor parking is already prohibited during the peak hours. The impact of on-street parking removal will be felt only during the off-peak hours (i.e., mid-days, evenings and weekends). In Santa Monica, where on-street parking is allowed during peak hours, the impact will be realized during all hours.

The Wilshire BRT project will provide off-street replacement parking, and the project budget includes funding commensurate with the one-for-one replacement of parking. To address the loss of parking for business or residential districts along Wilshire Boulevard, the MTA, as part of the project, would adopt a Replacement Parking Strategy. This strategy would seek to replace parking in locations convenient and accessible to existing businesses, employers and residences.

The strategy to identify the sites for such replacement parking is outlined below. These strategies can also be followed to provide additional parking at the stations where spillover parking is forecast. The approach to be employed by the MTA to reduce parking impacts is the following:

- Use existing MTA property if properly zoned and accessible to adjacent businesses. Along Wilshire this would entail the use of two properties owned by the MTA at Crenshaw and Wilshire (southwest corner) and at La Brea and Wilshire (northwest corner).
- The MTA shall coordinate with and inventory other public agencies for available surplus property, again as long as the zoning is appropriate for a parking use.
- The MTA shall acquire vacant sites, (located in areas zoned for commercial and parking use). These sites would have to be a minimum of 5,000 square feet and accommodate a minimum of 12 passenger cars.
- The MTA shall enter into agreements to make modifications to existing surface parking lots to restripe or reconfigure the layout to expand capacity.
- The MTA shall enter into agreements to participate in the construction and/or expansion of existing or planned public parking structures.
- The MTA shall enter into long-term agreements to make off-street parking structures available (if currently underutilized). This strategy would focus on office buildings or industrial properties with surplus spaces.
- The MTA shall acquire land and construct parking structures, if the sites are properly zoned and height limits allow a parking structure use.

As shown in Table 3.3-3, the need to replace lost curb parking is not equally distributed along the Wilshire route. The largest and most concentrated area of curb parking loss is in the Santa Monica segment. In this 2.6-mile section, approximately 4.6 acres of replacement parking space would be needed. The land requirements for surface parking average about 2 acres in other segments of the Wilshire route. This is based on an average land area requirement of 400 square feet per parking space.

TABLE 3.3-3
OFF STREET REPLACEMENT PARKING*

Segment	Affected Area	Parking Spaces to be Replaced and surface parking land requirement	Land Area Needed for Replacement as Surface Parking (Worst Case)	Potential Worst Case Theoretical Displacement Based on Existing Land Use Patterns
Los Angeles - Mid-City	Western to Bronson, and Citrus to San Vicente	242	2.2 acres	80,000 S.F. commercial and 20 dwelling units
Beverly Hills	San Vicente to Hamilton, and La Cienega to Maple	249	2.3 acres	80,000 S.F. commercial and 10 dwelling units
West Los Angeles	Comstock to Malcolm and Barry to Centinela	240	2.2 acres	50,000 S.F. commercial and 10 dwelling units

TABLE 3.3-3
OFF STREET REPLACEMENT PARKING*

Segment	Affected Area	Parking Spaces to be Replaced and surface parking land requirement	Land Area Needed for Replacement as Surface Parking (Worst Case)	Potential Worst Case Theoretical Displacement Based on Existing Land Use Patterns
Santa Monica	Centinela to Second	505	4.6 acres	50,000 S.F. commercial and 50 dwelling units

*Assumes one for one replacement of lost spaces.
Source: Korve Engineering and Terry A. Hayes Associates 2000.

Outlined below is a segment-by-segment characterization of the issues affecting the acquisition of property, which is provided to assess the likelihood that replacement parking can be provided in each segment of the corridor:

- *Western to Bronson.* MTA owns no sites. There are several surface parking lots that may be candidates for modification or decking. The need to acquire improved property is moderate.
- *Bronson to Citrus.* There are no displaced parking spaces along this segment. MTA owns one lot in this segment on the south side of Wilshire between Crenshaw and Lorraine. However, since there are no displaced spaces in this segment, this lot is beyond the reasonable distance for a replacement lot for those segments where parking is lost. The parking lot at this location, if implemented, would serve as a park-and-ride lot.
- *Citrus to San Vicente.* MTA owns one site at La Brea. Surface parking lots and rear surface parking suggest opportunities to minimize acquisition of new parking sites through either reconfiguration or construction of small parking structures on existing lots.
- *San Vicente to Hamilton.* MTA owns no sites. There are no vacant sites. Acquisition of improved property would be required to provide replacement parking in this segment.
- *La Cienega to Maple.* MTA owns no sites. Two to three vacant sites may provide opportunities for relocated parking. Less intensive use of office buildings may also offer opportunities to share space.
- *Comstock to Malcom.* MTA owns no sites. There are no vacant sites. There are no surface parking lots. Acquisition would likely affect low scale older residential properties fronting on Wilshire Boulevard. Replacement parking would likely require acquisition of property; however, acquiring residential property for this purpose may not be feasible given the unavailability of property.
- *Barry to Centinela.* MTA owns no sites. There are no vacant sites and no surface parking lots. One opportunity for replacement involves the use of underutilized existing structured parking in office buildings (if any). The probability is high that private property would have to be acquired for replacement parking.
- *Centinela to Second.* MTA owns no sites. There are no Wilshire frontage vacant sites. There are scattered small surface parking lots, 2-3 may be of sufficient size for redevelopment as parking structures. Acquisition would likely focus on the small-scale one-story commercial buildings at corners to avoid driveways on Wilshire Boulevard. The acquisition potential is high, however, the probability of acquiring these desirable locations from a willing seller is low.

The analysis of the different segments along Wilshire Boulevard indicates that it may not be feasible to provide a parking lot/structure in every block it is needed. As a result, the replacement parking that is eventually provided would be convenient for customers patronizing businesses on blocks where replacement parking is not proposed. Even if the 1,211 parking spaces are fully replaced, they will be in consolidated facilities, which will be less convenient than on-street parking directly in front of a business or residence.

In summary, the Wilshire BRT Alternative will have a significant unavoidable impact on access and convenience to fronting properties along Wilshire Boulevard during the off-peak hours due to the loss of on-street parking. This impact will be partially reduced by the development of off-street replacement parking as part of the BRT project, but it is not likely to be fully mitigated.

Safety. The loss of parking along Wilshire Boulevard will remove the buffer area created by parked cars between pedestrians on the sidewalk and moving travel lanes. Converting the parking lane to a travel lane in order to maintain a continuous-running median BRT will mean a narrower width for the through lane adjacent to the curb. This lane also functions as a right-turn lane. It also means that in the event of any emergencies (vehicular/ bus breakdown, accidents, and writing of traffic citations) vehicles will have to either block a travel lane or move to a side street that could potentially impact residential streets. The same is true for emergency vehicles such as fire, police and ambulatory care.

The removal of parking, however, will have a beneficial aspect in that it will eliminate side-conflicts between moving traffic and vehicles entering or leaving parking spaces. These may also be a reduction in the incidence of sideswipe accidents. In addition, the removal of on-street parking would have beneficial impacts on pedestrian safety in that potential conflicts between moving traffic and people entering and exiting their cars on the street side would be reduced.

Station Area Parking Spillover Impacts. The primary modes of access to the Wilshire BRT stations will be walking and transit, with some kiss-and-ride (drop off) activity. The lack of park-and-ride lots will reduce the likelihood that transit patrons will drive and park at Wilshire BRT stations. Some BRT patrons may attempt to park on residential streets within walking distance of Wilshire Boulevard, but it is unlikely that they will be able to do so. Most of the residential streets near Wilshire Boulevard already have time limited parking or residential permit parking. These restrictions make it unattractive for customers or employees of developments on Wilshire Boulevard to try and park on the side streets.

It is not anticipated that the Wilshire BRT Alternative will result in any significant parking impacts on the streets surrounding the BRT stations since BRT stations would be at the same locations as the existing Rapid Bus Stations. Station area parking spillover impacts would be less than significant.

Alternative 1A: Wilshire BRT (Median Adjacent Design Option)

Access and Convenience. The Median Adjacent Design Option will have the same impacts on parking as the Median Reconstruction Design Option. It will result in the removal of all on-street parking along the project length on Wilshire Boulevard. The Replacement Parking Strategy will seek to reduce this impact through the provision of off-street replacement parking, but it unlikely that this impact can be fully mitigated. Impacts to access and convenience would be significant and unavoidable.

Safety. The Median Adjacent Design Option will have the same impacts on safety associated with parking as the Median Reconstruction Design Option. It will result in the removal of the buffer between moving traffic and pedestrians on the sidewalk, but it will also reduce vehicular conflicts associated with parking activity. Impacts on pedestrian safety would be beneficial.

Station Area Parking Spillover Impacts. It is not anticipated that Alternative 1A will result in any significant parking impacts on the streets surrounding the BRT stations. Station area spillover parking impacts would be less than significant.

Alternative 1B: Wilshire BRT (Curb Adjacent Design Option)

Access and Convenience. The Curb Adjacent Design Option, if implemented on a 24-hour basis, will have the same impacts on parking as the Median Reconstruction Design Option. It will result in the removal of all on-street parking along the project length on Wilshire Boulevard. The Replacement Parking Strategy will seek to reduce this impact through the provision of off-street replacement parking, but it unlikely that this impact can be fully mitigated. Impacts to access and convenience would be significant and unavoidable.

Safety. The Curb Adjacent Design Option, if implemented on a 24-hour basis, will have the same impacts on safety associated with parking as the Median Reconstruction Design Option. It will result in the removal of the buffer between moving traffic and pedestrians on the sidewalk, but it will also reduce vehicular conflicts associated with parking activity. Safety impacts would be beneficial.

Station Area Parking Spillover Impacts. It is not anticipated that Alternative 1B will result in any significant parking impacts on the streets surrounding the BRT stations. Station area spillover parking impacts would be less than significant.

Alternative 2: Wilshire BRT and Exposition BRT

Access and Convenience. Alternative 2 will have the same parking impacts along the Wilshire Corridor as Alternative 1. The additional impacts associated with the BRT along the Exposition Corridor are discussed in this section. Impacts to access and convenience would be significant and unavoidable.

In the eastern-most portions of the Exposition Corridor, the BRT will run in mixed flow on city streets similar to the existing Rapid Bus operation and will not effect on-street parking. West of Vermont Avenue (to Venice Boulevard), the BRT will be located off-street within the MTA right-of-way, and the project will not effect on-street parking. Further to the west, BRT operations will return to the city streets and there will be no removal of on-street parking along Venice Boulevard. The transit facility will require the elimination of one travel lane in each direction, but will leave all parking along the curb.

On Sepulveda Boulevard, parking will be retained wherever feasible. The roadway will be widened and sidewalks narrowed to eight feet so that parking can be retained along most blocks. However, parking will not be provided on the approaches to intersections where left turn lanes are present or adjacent to the station at National Boulevard. This results in the removal of 157 on-street parking spaces along Sepulveda Boulevard. This loss of on-street parking will have similar effects on access and convenience, as described earlier for the BRT on Wilshire Boulevard. However, the elimination of 157 spaces out of a total of 526 spaces on Sepulveda Boulevard, is a loss of only 30 percent of the on-street parking supply and will not create an impact as significant as on the Wilshire BRT corridor where 100 percent of the parking is removed. The Replacement Parking Strategy will seek to purchase property for off-street replacement parking along Sepulveda Boulevard.

Further to the west, the BRT will be located in the MTA right-of-way and will not require removal of any on-street parking. Once the BRT reaches 17th Street in Santa Monica, it will return to operations in mixed flow on the streets to downtown Santa Monica. It will not effect on-street parking in this segment.

In summary, Alternative 2 will have a significant unavoidable impact on access and convenience to some fronting properties along Sepulveda Boulevard due to the loss of on-street parking.

Safety. The elimination of parking on the approaches to intersections on Sepulveda Boulevard to accommodate left turn lanes reduces the buffer between pedestrians and moving traffic. This is common on many arterials in the Los Angeles area and would not be expected to result in any significant impacts. The preservation of on-street parking results in a somewhat curvilinear alignment of the travel lanes as they transition around the parking and left turn lanes. This is also common on many arterials in the Los Angeles area and would not be expected to result in any significant impacts. Safety impacts would be less than significant.

Park-and-Ride Facilities and Station Area Parking Spillover Impacts. Park-and-ride facilities are proposed at six (6) locations along the Exposition Boulevard BRT and eight (8) locations for the Exposition LRT corridor alternative. The Exposition BRT Alternative will have a total planned parking supply of 2,881 spaces and the Exposition LRT Alternative will have 3,593 spaces. Table 3.3.4 provides a breakdown of parking spaces by station. The largest proposed parking facility is a 1,140 space lot at the Cloverfield station. In addition to the vehicular parking spaces listed in Table 3.3.4, each station will include bicycle parking facilities.

TABLE 3.3-4
EXPOSITION BRT/ LRT PROJECT – PARKING DEMAND AND CAPACITY

	BRT				**LRT**			
Station	**Station Type**	**P/R Capacity**	**Parking Demand**		**Station Type**	**P/R Capacity**	**Parking Demand**	
			Alt. 3	**Alt. 5 MOS**			**Alt. 2**	**Alt.4 MOS**
7th/Flower	**	-			Existing	-		
Pico/Flower	**	-			Existing	-		
Grand/Wash.	**	-			Existing ***	-		
Exposition/USC	**	-			At-Grade			
Vermont	**	-			At-Grade	-		
Western	At-Grade	-			At-Grade	-		
Crenshaw	At-Grade	400	136	148	At-Grade	400	392	408
La Brea	At-Grade	41	92	40	At-Grade	41	326	400
La Cienega	Aerial	363	126	187	Aerial	363	276	245
Hayden	At-Grade	-			-	-		
Wash./Venice	-	-	356	366	At-Grade	612	399	615

TABLE 3.3-4
EXPOSITION BRT/ LRT PROJECT – PARKING DEMAND AND CAPACITY

	BRT				LRT			
Station	**Station Type**	**P/R Capacity**	**Parking Demand**		**Station Type**	**P/R Capacity**	**Parking Demand**	
			Alt. 3	**Alt. 5 MOS**			**Alt. 2**	**Alt.4 MOS**
Main/Venice	At-Grade	-			-	-		
Overland/Venice	At-Grade				At-Grade	-		
Sepulveda/Venice	At-Grade				At-Grade	-		
Sepulveda/National	At-Grade				At-Grade	-		
Pico/Sawtelle	Aerial	585	187		Aerial	565	562	
Bundy	Aerial	372	36		Aerial	372	233	
Cloverfield	At-Grade	1140	40		At-Grade	1140	381	
14th/Colorado	**		13		-	-		
Ocean	**				At-Grade	100	341	
TOTAL		**2,881**	**986**	**741**		**3,593**	**2,907**	**1,668**

* With the Subway Design Option there would be no station at Vermont but an at-grade station under the I-110 Freeway (serving the I-110 Busway) and an underground station serving both Expo/USC and Vermont, located midway between Watt Way and Vermont Avenue.

** BRT to operate as Rapid Bus between 7th/Flower and Vermont/Exposition ROW and between 17th/Colorado and Broadway/Ocean.

*** With Flower St. Option there would be at-grade stations at 23rd/Flower and Jefferson/Flower instead of Expo/USC.

The Exposition BRT Alternative has six park-and-ride lots and exhibits less overall park-and-ride demand than the LRT Alternative. A total demand of 986 spaces is forecast and one of the six lots is forecast to have a demand exceeding its supply. The MTA travel demand forecasting model did forecast park-and-ride demand at two locations where parking lots are not planned as part of the project. Those two stations are:

- Venice/Washington
- 14th/Colorado Station

A demand for over 350 parking spaces was forecast at the Venice/Washington Station and about 15 at the 14th/Colorado Station in Santa Monica. The Venice/Washington station was replaced by the Venice/Main and National/Hayden stations. It can be anticipated that on-street parking will be impacted in the vicinity of each of these stations. If there are unrestricted, free on-street parking spaces within walking distance of these stations (about one quarter mile), BRT patrons will likely attempt to park on those streets to walk to the BRT station. It is difficult to quantify the precise number of on-street parking spaces that may be used by BRT patrons, and to establish a quantitative threshold of significance criteria applicable to all such streets, since the impact of on-street parking is subjective. Some residents are more sensitive to parking on their street than others, but the areas around Venice/Main and National/Hayden Stations are the ones most likely to be affected by spillover parking from the BRT Alternative.

Alternative 2A: Wilshire BRT and Exposition BRT (MOS)

Access and Convenience. The Exposition BRT MOS Alternative would be implemented in conjunction with the Wilshire BRT, so it would include the impacts of parking removal on Wilshire Boulevard associated with the Wilshire BRT. The MOS does not extend west to Sepulveda Boulevard, so this alternative will not result in the removal of on-street parking along the Exposition Corridor. It will have less than significant impacts on on-street parking.

Safety. The Exposition BRT MOS Alternative would be implemented in conjunction with the Wilshire BRT, so it would include the impacts of parking removal on Wilshire Boulevard associated with the Wilshire BRT. The MOS does not extend west to Sepulveda Boulevard, so this alternative will not result in the removal of on-street parking along the Exposition Corridor and would therefore not effect safety considerations due to changes in parking quantities. This alternative will have less than significant impacts on on-street parking.

Park-and-Ride Facilities and Station Area Parking Spillover Impacts. The BRT MOS Alternative has parking at three stations; Crenshaw, La Brea and La Cienega. The demand is not forecast to exceed the supply at any of these stations. The MTA travel demand forecasting model predicts a significant park-and-ride demand at the Venice/Washington station where no parking is proposed.

The demand for 366 park-and-ride spaces at this location was forecast, indicating that on-street parking in the vicinity of the Venice/Hayden Station can be expected. This could result in a significant parking impact on streets within walking distance of this station.

Alternative 3: Wilshire BRT and Exposition LRT (Full Length)

Access and Convenience. Alternative 3 will have the same parking impacts along the Wilshire Corridor as Alternatives 1 and 2. The additional impacts associated with the LRT along the Exposition Corridor are discussed in this section.

In the eastern-most portions of the Exposition Corridor, the LRT will run in the center of Hill Street. Two lanes of traffic will be provided in the southbound direction, with no parking along the west side of Hill Street. One travel lane will be retained in the northbound direction, with parking along the east side of the street. The on-street parking supply along the blocks of Hill Street between Washington Boulevard and Jefferson Boulevard will be reduced by 50 percent (a loss of 10-12 parking spaces). This will negatively affect the convenience of parking access to properties along the west side of Hill Street. It should not have as significant of an affect on loading access, however, since with two travel lanes on Hill Street, delivery vehicles are likely to stop at the west curb, blocking a travel lane, while loading.

West of Hill Street, to Venice Boulevard, the LRT will be located off-street within the MTA right-of-way, and the project will not affect on-street parking. Further to the west, LRT operations will return to city streets and there will be no removal of on-street parking along Venice Boulevard. The transit facility will require the elimination of one travel lane in each direction, but will leave all parking along the curb.

On Sepulveda Boulevard, parking will be retained wherever feasible. The roadway will be widened and sidewalks narrowed to eight feet so that parking can be retained along most blocks. However, parking will not be provided on the approaches to intersections where left turn lanes are present or adjacent to the station at National Boulevard. This results in the removal of 157 on-street parking spaces along Sepulveda Boulevard. This loss of on-street parking will have similar affects on access and convenience, as described earlier for the BRT on Wilshire Boulevard. However, the elimination of 157 spaces out of a total of 526 spaces on Sepulveda Boulevard, is a loss of only 30 percent of the on-street parking supply and will not create an impact as significant as on the Wilshire BRT corridor where 100 percent of the parking is removed. The Replacement Parking Strategy will seek to purchase property for off-street replacement parking along Sepulveda Boulevard.

Further to the west, the LRT will be located in the MTA right-of-way and will not require removal of any on-street parking. Once the LRT reaches Olympic Boulevard in Santa Monica, it will transition to an in-street running operation sharing the roadway with mixed flow traffic until it becomes grade separated and crosses the Santa Monica Freeway. It will not affect on-street parking in this segment.

In summary, Alternative 3 will have a significant unavoidable impact on access and convenience to some fronting properties along Hill Street and Sepulveda Boulevard due to the loss of on-street parking.

Safety. The elimination of parking along the west side of Hill Street will eliminate the buffer between pedestrians and moving traffic. However, there is limited pedestrian activity along this industrialized segment of Hill Street.

The elimination of parking on the approaches to intersections on Sepulveda Boulevard to accommodate left turn lanes reduces the buffer between pedestrians and moving traffic. This is common on many arterials in the Los Angeles area and would not be expected to result in any significant impacts. The preservation of on-street parking results in a somewhat curvilinear alignment of the travel lanes as they transition around the parking and left turn lanes. This is also common on many arterials in the Los Angeles area and would not be expected to result in any significant impacts.

Park-and-Ride Facilities and Station Area Parking Spillover Impacts. Park-and-ride facilities are proposed at eight (8) locations for the Exposition LRT alternative. The Exposition LRT Alternative will have 3,593 spaces. Table 3.3.4 above provided a breakdown of parking spaces and park-and-ride demand by station. The largest proposed parking facility is a 1,140 space lot at the Cloverfield station. All of the stations will also include bicycle parking facilities.

Although the overall parking demand may not exceed the total supply at stations on the Exposition Corridor, instances may occur at individual stations, or during certain times where the balance of demand exceeds the supply of parking at the planned park-and-ride lots. In such instances, adjacent neighborhoods may be impacted by non-local/non-residential traffic attempting to find either short-term or long-term parking for the day.

The Exposition LRT Alternative exhibits a strong demand for park-and-ride spaces. A total daily park-and-ride demand of 2,907 spaces is forecast. This alternative has five stations where parking demand is forecast to exceed the planned capacity of the station parking lots. Those two locations are:

- La Brea Station
- Ocean Avenue Station

It can be anticipated that on-street parking activity will increase in the vicinity of each of these stations. If there are unrestricted, free on-street parking spaces within walking distance of these stations (about one quarter mile), LRT patrons will likely attempt to park on those streets to ride the train. It is difficult to quantify the precise number of on-street parking spaces that may be used by LRT patrons, and to establish a quantitative threshold of significance criteria applicable to all such streets, since the impact of on-street parking is subjective. Some residents are more sensitive to parking on their street than others, but the areas around these two stations are the ones most likely to be affected by spillover parking from the LRT Alternative.

Alternative 3A: Wilshire BRT and Exposition LRT (MOS)

Access and Convenience. The Exposition LRT MOS Alternative would be implemented in conjunction with the Wilshire BRT, so it would include the impacts of parking removal on Wilshire Boulevard associated with the Wilshire BRT. It will affect on-street parking along Hill Street, similar to Alternative 3. However, since the MOS does not extend west to Sepulveda Boulevard, this alternative will not result in the removal of on-street parking along Sepulveda Boulevard. This alternative will have less than significant impacts on on-street parking.

Safety. The Exposition LRT MOS Alternative would be implemented in conjunction with the Wilshire BRT, so it would include the impacts of parking removal on Wilshire Boulevard associated with the Wilshire BRT. It will affect on-street parking along Hill Street, similar to Alternative 3, but the MOS does not extend west to Sepulveda Boulevard, so this alternative will not result in the removal of on-street parking along Sepulveda Boulevard. It will have less than significant impacts on on-street parking.

Park-and-Ride Facilities and Station Area Parking Spillover Impacts. The LRT MOS Alternative has parking at four stations; Crenshaw, La Brea, La Cienega, and the Venice/Washington terminus station. The park-and-ride lots at the four stations will have a total supply of 1,416 spaces. The forecast demand is 1,668 spaces, with virtually all of the excess demand forecast at the La Brea Station.

The demand at the La Brea Station is more than 350 cars higher than the proposed supply of parking. It can be anticipated that on-street parking will be impacted in the vicinity of the La Brea Station. The park-and-ride lots planned for the Crenshaw and Venice/Washington Stations were also estimated to be at capacity. However, since latent parking demand is projected to be minimal for these park-and-ride lots, the spillover of parking into the local neighborhoods would be minimal.

Maintenance Yard

The site selected for the maintenance yard for buses or light rail vehicles will be designed to accommodate all of the transit vehicle and employee parking on-site. If the site is small, a parking structure may be included in the site plan to provide adequate employee parking. The maintenance yard will not affect on-street parking on adjacent streets and will not cause any parking impacts. There would be no impacts to parking as a result of maintenance yards.

Subway Design Option at USC/Exposition Park (for Alternatives 2, 2A, 3, and 3A)

The subway design option will not affect on-street parking and, therefore, will not have a significant impact on parking.

3.3.4 Mitigation Measures

Parking Replacement Mitigation (Applies to Alternatives 1, 1A, 1B, 2, 2A, 3, 3A)

The MTA shall implement the proposed Parking Replacement Strategy to identify how and where to provide 1,335 additional parking spaces distributed along the Wilshire Corridor and 157 spaces along Sepulveda Boulevard. Every attempt shall be made to provide the replacement parking spaces in close proximity to where they will be eliminated.

Peak Hour Only BRT Operations (Applies to Alternatives 1, 1A, 1B, 2, 2A, 3, 3A)

Should the Replacement Parking Strategy prove to be infeasible, the MTA could consider implementing the Wilshire BRT only during peak periods. This will eliminate the parking impact during off-peak periods, leaving a peak period parking impact only in those segments of the corridor where peak hour parking is not already prohibited (i.e., in Santa Monica). Should the replacement parking strategy prove to be infeasible in the City of Santa Monica, the MTA could consider implementation of the Wilshire BRT project as a continuation of Rapid Bus service in that city (TSM Alternative) with no dedicated transit lane. This would eliminate the parking impact.

Rapid Bus Operations on Sepulveda Boulevard (Applies to Alternative 2)

Should the Replacement Parking Strategy prove to be infeasible, the MTA shall implement the Exposition BRT segment on Sepulveda Boulevard as a Rapid Bus operation, similar to the segments at the eastern and western ends of the corridor, where the buses will run in mixed flow traffic lanes. This will eliminate the need to prohibit parking on the Sepulveda Boulevard segment of Alternative 2.

Residential Neighborhood Protection/Parking Control Mitigations (Applies to Alternatives 1, 1A, 1B, 2, 2A, 3, 3A)

Parking provisions and controls can directly affect the volume of traffic on residential streets, particularly where these streets are used for parking by commuters, shoppers, and other non-related traffic attracted by nearby non-residential destinations. Parking controls may be the only effective traffic management strategy for a neighborhood experiencing an increase in traffic volumes and parking utilization on local streets by users of the transit service from outside of the local area.

The following mitigation measures shall be considered in the areas adjacent to the park-and-ride lots where demand was forecast to exceed supply and adjacent to stations with no parking, if LADOT determines that spillover parking is causing a significant impact. Four basic control approaches exist to deal with outsider parking in neighborhoods:

- Prohibit on-street parking;
- Time-limited parking;
- Resident permit parking; and
- Non-resident permits for registered car-poolers who work in the zone.

Additionally, the following approaches may be considered in situations where parking supply is low or non-existent and/or parking demand is high.

- Negotiate with local property owners to allow leasing of all day parking spaces.
- Consider parking controls in neighborhoods where parking spillover from park-and-ride facilities have become problematic.
- Institute parking controls in communities affected by general spillover of parking at stations without parking facilities

3.3.5 Cumulative Impacts

The reduction of the amount of on-street parking or the use of on-street parking by transit users in station areas will have the cumulative impact of making it increasingly more difficult to find an available on-street parking location. This will result in a significant adverse affect in areas where the supply of off-street parking is not adequate to fully meet the needs of the land uses generating the parking demand. This is a cumulative effect of developments being built with inadequate parking. Over the years, many of the local jurisdictions along these potential transit corridors did not require adequate off-street parking and in some instances did not require any off-street parking. This has caused many of the land uses in older buildings along these corridors to depend on the use of on-street parking to meet their employee and customer parking needs. The local jurisdictions all have parking programs designed to address this cumulative parking impact either through the provision of off-street public parking or the regulation of the use of on-street parking.

3.4 Socioeconomics

3.4.1 Introduction

Information contained in this section of the EIS/EIR was obtained from the 1990 US Census; the Southern California Association of Government (SCAG); the City of Los Angeles 2000 Economic and Demographic Information Report; the Mid-City/Westside Transit Corridor Study MIS (incorporated by reference); and site surveys performed by EIP Associates in 1999 and 2000. The purpose of this section is to provide baseline data on the existing socioeconomic characteristics of the study area and to identify potentially significant impacts to the socioeconomic environment resulting from implementation of the alternatives considered. Section 4.7 of this document provides an evaluation of potential project impacts on minority and low-income populations in accordance with Executive Order 12898 on Environmental Justice.

3.4.2 Affected Environment

The study area is located in western Los Angeles County and encompasses approximately 112 square miles. Approximately 16 percent of the population and 24 percent of the jobs in Los Angeles County are concentrated in the study area. According to a market trend analysis conducted by Grubb & Ellis, 27 percent of the Los Angeles County's 161 million square feet of new office space is on the Westside, which makes it the largest office market in Los Angeles.

Los Angeles County is the most populous county in California. Currently, County population is 9,524,890 residents. By the year 2020, the population is projected to be 12,249,104 residents, accounting for approximately 60 percent of the metropolitan region's population. The County's 20-year population growth rates are estimated at 31 percent between 1980 and 2000 and forecasted at 25 percent between 2000 and 2020.

Population and employment densities in the Mid-City/Westside study area are the highest within the Los Angeles metropolitan region, averaging approximately 13,883 persons per square mile and 9,167 employees per square mile. Population and employment densities are shown in Figure 3.4-1, Existing Population Density and Figure 3.4-2, Existing Employment Density. These figures show that the more densely populated areas are concentrated in the east and northwestern portion of the study area, while the greatest employment densities are in the western and northwestern portion of the study area.

According to the *West Los Angeles Transit Corridor Technical Report* prepared by the Southern California Association of Governments (SCAG, 1998): "the population density in the SCAG study area [which is roughly equivalent to that of the Mid-City/Westside study area] in 1990 was about 9,600 persons per square mile, which was more than four times the County." Population density for the MTA study area in 1997 was approximately 13,883 persons per square mile; over six times that of the LA County 2,300 persons per square mile. According to SCAG's forecasts, the population density will increase to over 17,000 persons per square mile by the year 2020, compared with 3,017 persons per square mile in the County.

Figure 3.4-1 Existing Population Density

Figure 3.4-2 Existing Employment Density

Employment densities are also higher in the Mid-City/Westside study area than in the County as a whole. In 1997, the study area employees per square mile were 9,167 compared with a County employment density of 1,070 employees per square mile. These densities will increase by the year 2020 to 10,829 employees per square mile in the study area versus 1,433 employees per square mile in the County.

Population and employment forecasts to the year 2020 adopted by SCAG as part of Regional Transportation Plan suggest that the study area will capture a disproportionate share of growth over the next 20 years. The study area Wilshire Corridor has a population of 1,555,005 and an employment base of 1,026,685. According to SCAG's most recent adopted forecast (April 1998), the study area is expected to grow by 356,265 (18.85 percent increase) persons and 186,200 (15.35 percent increase) employees between 1997 and 2020.

Employment densities in the study area are the highest within the metropolitan region, averaging approximately 9,167 employees per square mile. The employment density of the County is 1,070 employees per square mile. These densities will increase by the year 2020 to 10,829 employees per square mile in the study area and 1,433 employees per square mile in the County.

The study area currently has an employment base of 1,026,685 employees. According to SCAG's most recent adopted forecast (April 1998), employment is expected to grow by 186,200 (15.35 percent increase) employees by the year 2020.

The primary engine for growth in the study area will be business services and entertainment related businesses. As further indicated in the Grubb &Ellis report, other sectors in the Westside economy contribute to regional, as well as statewide economic growth: "in the 1980s and 1990s five sectors emerged to propel California economic base forward: foreign trade, high tech manufacturing, professional services, tourism, and entertainment. The West Los Angeles market is home to most of these industries which have been a principal catalyst to economic growth, and a driving force for the office market." Over the past decade there has been an ever-increasing number of these businesses located in West Los Angeles/Century, Santa Monica, and Culver City. Although the specific "Dreamworks Studio Campus" at Playa Vista has been put on hold, it is anticipated that there will be a significant increase in production and postproduction type businesses on the Westside. Many of the current office and warehouse space vacancies are featuring references to the availability of "creative space" rented in 10,000+ square feet increments.

Growth in the study area will continue to be fueled by the fact that entertainment and media related businesses are concentrating in the western part of the corridor. U.S. Census County Business Patterns data indicate that these new service businesses are locating in West Hollywood, Beverly Hills, West Los Angeles, Culver City, and Santa Monica (see Figure 3.4-3). Real estate analysts expect that the demand for production and creative spaces will continue to be robust. The industries and businesses that are attracted to the study area are those that are expected to be the foundation of the local and regional economy for many years into the future. In addition, the Mid-City/Westside area is the center of approximately one-third of all new office construction under way in LA County.

Figure 3.4-3 Service Business Growth (1994-1996) Study Area Zip Codes

Wilshire Boulevard

The Wilshire Right-of-Way (ROW) is illustrated in Figure 2-1 (Section 2.0, Alternatives Considered). Table 3.4-1 provides the current demographic setting of the Corridor and displays relevant 1990 United States Census data from the Census Block Groups, which border the corridor approximately 0.5 mile each direction.

TABLE 3.4-1
WILSHIRE RIGHT-OF-WAY
DEMOGRAPHIC DATA

Persons	178,866
Households	86,367
Housing Units	93,932
Own	21,072
Rent	64,495
Employed	98,812
Work in City	95,015
Transit Mode	
Drive Alone	66,229
Carpool	8,420
Public Transportation	6,267
Automobile Count	
No Vehicle	11,971
1 Car	42,085
2 Car	24,798
Occupation by Industry	
Manufacturing	8,146
Utility	4,642
Trade/Construction	18,903
Finance, Insurance, Real Estate	11,511
Service	17,463
Professional Service	32,868
Public	1,815
Executive/Management	45,353
Sales	35,469
Median Income	48,758

The Wilshire Bus Rapid Transit (BRT) Alternative contains 14 station terminals in Mid-City Los Angeles, Beverly Hills, West Los Angeles, and Santa Monica. Table 3.4-2 contains demographic data for a 0.5-mile radius around each of the station locations. Included within this table is number of persons, number of households, housing unit ownership, number employed, commute information, occupation by industry type, and median income all within a 0.5 mile radius around each station location. Figure 3.4-4 displays the median income densities within the Mid-City/Westside study area, and Figure 3.5-1 (Section 3.5, Land Use/Neighborhoods) shows the locations of the stations and a 0.5-mile radius around them. Both of these figures follow Table 3.4-2.

TABLE 3.4-2
WILSHIRE BRT STATIONS DEMOGRAPHIC DATA

	Station Location													
	Western	**Crenshaw**	**La Brea**	**Fairfax**	**La Cienega**	**Robertson**	**Beverly**	**Santa Monica**	**Westwood Village**	**Barrington**	**Bundy**	**Wilshire/14th**	**Wilshire/4th**	**Ocean**
Persons	2,550	566	826	1,288	1,017	216	557	1,066	2,651	1,169	1,815	1,155	712	821
Households	1,218	204	281	890	619	1,159	284	571	1,450	28	977	448	453	636
Housing Units	1,317	261	291	1,012	628	1,279	322	649	1,656	32	1,029	482	599	701
Own	13	79	207	11	89	246	106	139	198	14	118	94	13	61
Rent	1,205	125	74	879	530	913	178	432	1,252	14	859	354	530	640
Employed	1,179	306	456	829	707	1,218	387	609	1,543	54	1,091	570	309	529
Work in City	1,170	294	416	829	660	1,190	387	600	1,478	54	1,030	558	279	374
Transit Mode														
Drive Alone	614	188	293	567	480	931	196	457	967	20	692	418	130	201
Carpool	121	44	65	107	44	72	27	16	57	0	98	20	47	28
Public Transportation	294	32	10	51	64	69	0	48	65	34	132	78	55	47
Automobile Count														
No Vehicle	548	26	18	126	103	139	20	71	155	0	74	60	267	211
1 Car	452	74	57	542	366	596	103	56	795	5	590	247	218	317
2 Car	139	61	128	201	131	338	96	178	392	29	265	112	19	83
Occupation by Industry														
Manufacturing	60	26	47	62	71	92	50	49	90	0	43	59	25	33
Utility	84	19	19	61	43	111	8	23	23	0	45	33	45	52
Trade/Construction	271	62	49	149	166	199	87	129	396	25	241	75	55	68
Finance, Insurance, Real Estate	180	38	54	61	55	161	27	120	157	8	190	17	11	24
Service	296	62	97	195	154	290	117	53	308	0	148	115	96	111
Professional Service	223	78	147	266	202	299	101	235	505	21	346	243	53	65
Public	24	15	27	35	12	32	0	0	32	0	32	10	0	8
Executive/Management	292	122	246	391	326	550	244	334	727	34	439	301	55	62
Sales	366	103	120	319	282	525	109	224	659	20	453	137	139	106
Median Income	$16,987	$57,393	$74,574	$27,941	$32,010	$48,386	$82,961	$39,904	$32,545	$93,370	$32,633	$28,981	$15,132	$31,223

Source: 1990 US Census

Figure 3.4-4 Median Household Income

Figure 3.4-5 Households with No Automobile Available

Exposition Right-of-Way

The Exposition Right-of-Way (ROW) is illustrated in Figure 2-1. Census data was collected for an area bordering both sides of the corridor by 0.5 miles. Table 3.4-3 provides the current demographic setting and displays 1990 US Census data from the Census Block Groups for the Exposition corridor.

TABLE 3.4-3
EXPOSITION RIGHT-OF-WAY
DEMOGRAPHIC DATA

Persons	148,399
Households	55,192
Housing Units	59,514
Own	18,284
Rent	36,908
Employed	70,864
Work in City	67,721
Transit Mode	
Drive Alone	44,968
Carpool	9,436
Public Transportation	7,384
Automobile Count	
No Vehicle	8,700
1 Car	24,444
2 Car	16,041
Occupation by Industry	
Manufacturing	10,486
Utility	4,768
Trade/Construction	13,680
Finance, Insurance, Real Estate	5,115
Service	11,072
Professional Service	19,321
Public	1,992
Executive/Management	19,555
Sales	23,583
Median Income	$31,321

The Exposition LRT Alternative contains 17 station terminals in Los Angeles, Culver City, West Los Angeles, and Santa Monica. Tables 3.4-4 and 3.4-5 contain demographic data for a 0.5-mile radius around each station location. The Exposition BRT Alternative contains 20 station terminals in Los Angeles, Culver City, West Los Angeles, and Santa Monica, while the LRT Alternative contains17 station terminals within the same area. Included within these tables is number of persons, number of households, housing unit ownership, number employed, commute information, occupation by industry type, and median income all within a 0.5 mile radius around each station location. Figure 3.4-4 displays the median income densities within the Mid-City/Westside study area. Figure 3.4-1 (Section 3.4, Land Use/Neighborhoods and Communities) shows the locations of the stations and a 0.5-mile radius around them.

TABLE 3.4-4
EXPOSITION LRT STATIONS DEMOGRAPHIC DATA

	Station Location																
	7th/Flower	**Pico/Flower**	**Washington/Grand**	**I-110/USC/Exposition Park**	**Vermont**	**Western**	**Crenshaw**	**La Brea**	**La Cienega**	**Venice/Washington**	**Venice/Overland**	**Venice Sepulveda**	**Sepulveda/National**	**Pico/Sawtelle**	**Bundy**	**Cloverfield**	**Ocean/Colorado**
Persons	667	454	3,061	1,491	2,104	1,363	718	785	826	1,326	3,333	872	890	597	720	1,888	327
Households	205	96	621	374	557	470	318	329	307	370	1,752	362	435	274	304	800	174
Housing Units	290	98	632	411	618	519	323	338	318	389	1,859	382	500	298	313	836	227
Own	2	3	95	14	64	161	211	144	223	149	71	141	97	49	122	28	23
Rent	203	93	526	360	493	309	107	185	84	221	1,681	221	338	225	182	772	151
Employed	199	229	1,117	657	666	486	358	331	357	594	2,144	510	579	393	420	1,113	171
Work in City	199	229	1,086	605	638	494	347	318	334	563	2,060	477	544	377	411	1,097	171
Transit Mode																	
Drive Alone	61	107	317	174	291	278	304	258	246	425	1,482	407	372	267	293	658	65
Carpool	17	23	269	192	204	102	26	42	50	73	300	47	37	48	81	132	47
Public Transportation	78	70	365	141	118	77	6	31	9	39	159	26	67	34	37	149	22
Automobile Count																	
No Vehicle	91	13	267	69	135	181	4	65	10	28	122	39	93	31	22	108	22
1 Car	96	63	251	217	264	148	116	124	83	156	958	113	195	130	147	476	126
2 Car	10	15	57	71	98	122	152	66	147	123	577	134	118	86	85	186	46
Occupation by Industry																	
Manufacturing	123	81	482	304	242	73	32	51	79	117	223	95	30	36	34	216	34
Utility	14	0	68	18	9	52	20	52	85	25	126	17	64	18	40	49	6
Trade/Construction	32	42	230	129	46	83	46	13	62	117	282	105	138	81	73	291	43
Finance, Insurance, Real Estate	0	0	17	9	46	34	35	39	21	41	241	17	9	44	25	107	25
Service	8	40	174	63	123	112	33	24	7	82	251	59	106	96	74	104	26
Professional Service	11	16	70	95	131	90	124	116	80	153	844	205	162	58	124	252	18
Public	0	8	22	6	0	8	56	17	5	11	59	8	7	0	8	66	0
Executive/Management	10	18	18	48	55	48	104	134	35	102	871	258	198	135	100	292	46
Sales	14	36	208	137	129	175	134	81	179	159	765	126	171	116	145	355	68
Median Income	$9,234	$19,375	$18,750	$21,382	$11,563	$16,955	$42,218	$17,159	$33,636	$37,206	$30,965	$33,462	$31,875	$31,250	$33,482	$26,639	$19,722
Source: 1990 US Census																	

TABLE 3.4-5
EXPOSITION BRT STATIONS DEMOGRAPHIC DATA

	Station Location																			
	7th/Flower	**Figueroa/Pico**	**Figueroa/Adams**	**Exposition/USC**	**Figueroa/Jefferson**	**Vermont**	**Western**	**Crenshaw**	**La Brea**	**La Cienega**	**National/Hayden**	**Venice/Main**	**Venice/Overland**	**Venice/Sepulveda**	**Sepulveda/National**	**Pico/Sawtelle**	**Bundy**	**Cloverfield**	**Colorado/14th**	**Ocean/Santa Monica**
Persons	667	454	3,061	1,491	984	2,104	1,363	718	785	826	748	3,883	3,333	872	890	597	720	1,888	1056	327
Households	205	96	621	374	241	557	470	318	329	307	437	2,144	1,752	362	435	274	304	800	481	174
Housing Units	290	98	632	411	298	618	519	323	338	318	517	2,993	1,859	382	500	298	313	836	502	227
Own	2	3	95	14	10	64	161	211	144	223	34	65	71	141	97	49	122	28	43	23
Rent	203	93	526	360	192	493	309	107	185	84	403	2,079	1,681	221	338	225	182	772	43	151
Employed	199	229	1,117	657	693	666	486	358	331	357	577	2,719	2,144	510	579	393	420	1,113	456	171
Work in City	199	229	1,086	605	684	638	494	347	318	334	554	2,578	2,060	477	544	377	411	1,097	450	171
Transit Mode																				
Drive Alone	61	107	317	174	143	291	278	304	258	246	426	2,003	1,482	407	372	267	293	658	269	65
Carpool	17	23	269	192	84	204	102	26	42	50	64	286	300	47	37	48	81	132	60	47
Public Transportation	78	70	365	141	138	118	77	6	31	9	33	209	159	26	67	34	37	149	22	22
Automobile Count																				
No Vehicle	91	13	267	69	102	135	181	4	65	10	20	232	122	39	93	31	22	108	162	22
1 Car	96	63	251	217	184	264	148	116	124	83	241	1,162	958	113	195	130	147	476	139	126
2 Car	10	15	57	71	38	98	122	152	66	147	158	673	577	134	118	86	85	186	114	46
Occupation by Industry																				
Manufacturing	123	81	482	304	201	242	73	32	51	79	50	383	223	95	30	36	34	216	12	34
Utility	14	0	68	18	10	9	52	20	52	85	38	112	126	17	64	18	40	49	15	6
Trade/ Construction	32	42	230	129	95	46	83	46	13	62	113	585	282	105	138	81	73	291	153	43
Finance, Insurance, Real Estate	0	0	17	9	2	46	34	35	39	21	23	271	241	17	9	44	25	107	37	25
Service	8	40	174	63	92	123	112	33	24	7	88	413	251	59	106	96	74	104	97	26
Professional Service	11	16	70	95	71	131	90	124	116	80	248	796	844	205	162	58	124	252	86	18
Public	0	8	22	6	0	0	8	56	17	5	0	65	59	8	7	0	8	66	33	0
Executive/ Management	10	18	18	48	10	55	48	104	134	35	290	1,097	871	258	198	135	100	292	110	46
Sales	14	36	208	137	212	129	175	134	81	179	225	1,017	765	126	171	116	145	355	159	68
Median Income	$9,234	$19,375	$18,750	$21,382	$17,840	$11,563	$16,955	$42,218	$17,159	$33,636	$31,415	$31,160	$30,965	$33,462	$31,875	$31,250	$33,482	$26,639	$25,261	$19,722

Source: 1990 US Census

3.4.3 Impact Assessment and Mitigation Measures

Standards of Significance

An adverse impact to socioeconomic resources would result if any of the following conditions are met:

- The alternatives considered would have a substantial adverse effect on businesses along each corridor;
- The alternatives considered would have a substantial adverse impact to population.

Methodology for Impact Evaluation

The evaluation method for impacts to socioeconomic resources entails a review of 1990 US Census Demographic Data to determine whether there are businesses or individuals within the project corridor that could be impacted by either construction or operational-related impacts.

The proximity to transit supportive land use can also be measured in terms of the population and employment served by the various alternatives. The number of persons and employees within 0.5 mile of a proposed transit station indicates the convenience of the transit service and the potential ridership, since 0.5 mile is considered the maximum distance people will walk to access transit. Furthermore, concentrations of population are indicative of concentrations of businesses and services located nearby.

Impacts

According to a search of the General Plans of affected cities, there are no plans or policies relating to socioeconomic factors that would be affected by the proposed alternatives.

No Action Alternative (Baseline)

Effects on Local Businesses. As discussed in Section 2.0 of this report, the No Action Alternative would not entail physical changes to the corridor area, and would focus on operational bus improvements, such as an increase in fleet size. This increase in fleet size would not result in any physical changes within the current bus routes, but merely increase the numbers of buses along the routes. Buses would continue to operate along city streets and there would be no effects outside of these ROWs. Therefore, no disruption would occur to either access or visibility of businesses located along the existing routes and station intersections. Since service along the routes would not change, no impacts to workers who use public transportation for commuting purposes or businesses relying on employees using public transportation would occur. Impacts would be less than significant.

Effects on Population. As discussed in Section 2.0 of this report, the No Action Alternative would not entail physical changes to the corridor area, and would focus on operational bus improvements, such as an increase in fleet size. Buses would continue to operate along city streets and there would be no effects outside of these ROWs. Any operational changes inside the corridor resulting from an increase in fleet size would likely not effect the current population trends inside the corridor. Impacts would be less than significant.

Transportation System Management (TSM) Alternative

Effects on Local Businesses. Similar to the No Action Alternative, this option would focus on enhancements and restructuring of transit service within the corridor area. MTA local service buses, as well as MTA Rapid Bus service, would continue to operate along city streets and highways and there would be no effects outside of these ROWs. It is assumed that any increase in fleet size would not result in any physical changes within the current bus routes, but merely increase the numbers of buses along the routes. Increased service along existing routes would not impact access or visibility of businesses located along the existing corridors and station intersections. Impacts would be less than significant.

Effects on Population. Similar to the No Action Alternative, this option would focus on enhancements and restructuring of transit service within the corridor area. MTA local service buses, as well as MTA Rapid Bus service, would continue to operate along city streets and highways and there would be no effects outside of these ROWs. The only changes inside the corridor resulting from the TSM Alternative would likely not effect the current population trends inside the corridor. Impacts would be less than significant.

Alternative 1: Wilshire BRT (Baseline Median-Running)

Effects on Local Businesses. Loss of on-street parking immediately adjacent to a business would be considered an access impediment because patrons would most likely be dissuaded from visiting a business if parking is not readily available. The inclusion of an isolated transit lane will result in the loss of on-street parking. This type of access impediment would likely be most problematic within areas where businesses are highly dependent on on-street metered parking along Wilshire Boulevard. For example, much of the parking serving the retail stores and office buildings of the commercial districts in the Cities of Beverly Hills (e.g., Golden Triangle, Rodeo Drive, etc.) and Santa Monica (e.g., 3rd Street Promenade) is currently on-street parking. Loss of this current available on-street parking would result in the loss of access to businesses, thereby possibly leading to a loss in business patrons and their revenue. This alternative represents a direct change in existing on-street parking that could result in a socioeconomic impact along the route. Because the loss of parking would be the catalyst for any socioeconomic impact, the assessment of this particular impact is addressed in Section 3.3 (Parking) of this document, where the direct and indirect effects on any loss in parking associated with the alternatives is addressed.

Effects on Population. The Wilshire BRT, as discussed in Section 2.0, follows existing public ROWs and is largely contained within existing limits of the Wilshire Boulevard ROW. As shown in Tables 3.4-1 and 3.4-2, and Figures 3.4-1 through 3.4-4, the population within the Wilshire ROW is significant, with 8 of the proposed stations containing a 1990 population greater than 1,000 persons within 0.5 miles of the station intersection. The Wilshire BRT would result in an improvement to the public transportation system serving the area. This improvement could result in an increase in population to the area, making the area more desirable. However, this increase is expected to be within the normal growth expected for the corridor and Los Angeles as a whole. Furthermore, population growth within the vicinity of the route is limited to existing housing availability and market factors that are not directly related to the proposed transit improvements. No significant direct impact to population growth is expected to occur as a result of the proposed alternative. Impacts would be less than significant.

Increased Mobility for Transit-Dependent. The concentration of activity centers in the study area has a corresponding impact on corridor travel characteristics. In 1998, the Mid-City/Westside Corridor Study Area had nearly 8.5 million daily person trips, of which 2.3 million, or 27.5 percent were home to work trips, and over 675,000, or 8 percent, are made on transit. When compared to the region as a whole, the study area has a higher percentage of work trips (by 7 percentage points) of all daily trips. This is a reflection of relatively higher population density, as well as an abundance of employment opportunities in the Corridor study area. The more notable observation is the significantly higher transit percentage for the study area trips compared to the overall regional transit percentage. The study area's percent transit mode split is 2.5 times higher than the regional 3.2 mode split. This is a clear indication of two characteristics related to the study area: high transit dependency in certain study area communities and relatively high levels of transit services that are provided in the study area.

Part of the underlying reason for high transit usage in the study area is that a significant number of households are autoless and have low incomes. These two factors are considered to be indicative of transit dependency. According to Tables 3.4-2, 3.4-4, and 3.4-5, a large percentage of the households in the Study Area did not have a vehicle compared to Los Angeles County as a whole. Figure 3.4-5 shows the households within the study area with no automobile available.

Figure 1-3, which is provided in Section 1 of this document, displays transit friendly land uses (including activity centers) within the study area. The existing activity centers in the study area are a central part of a large concentration of land uses that are considered transit-supportive. Transit supporting land uses encompass approximately 30 of the 112 square-mile study area. Existing transit usage within the study area is proportionally higher than any other area in Los Angeles County. Because there is a large base of existing transit service and transit patrons, increasing the transit mode share through increased service would represent a natural extension of exiting patterns and trends.

Because the study area represents a significant concentration of educational, cultural/entertainment, and office centers, and because the area is the most densely populated area within the region (over 13,883 persons per square mile), there has traditionally been a substantial amount of transit service and transit use. According to the SCAG *Transit Corridor Technical Report*, "the proportion of workers who took the bus [in the study area] was double that of the County [13.64 percent for the study area versus 6.8 percent for the County]. The Census Transportation Planning Package (CTPP), transportation data collected as part of the 1990 Census, further substantiates this. This data indicates, "41 percent of all work transit trips in Los Angeles County originate in the study area."

The significance of the study area's travel characteristics compared to the region is revealed in the following (MIS, 2000):

- The Corridor study area's total daily person trips account for 16.7 percent of the total trips in the region; and
- More than one out of every five home-work trips in the region (22.7 percent) are related to the study area.

This again points to the higher population and employment opportunities in the study area. These areas constitute high numbers of activity centers and businesses located within the corridors. The proximity to transit supportive land use can also be measured in terms of the population and employment served by the alternative. The number of persons and employees within 0.5 mile of a proposed transit station indicates the convenience of the transit service and the potential ridership, since 0.5 mile is considered the maximum distance people will walk to access transit.

The Wilshire Boulevard Corridor traverses densely populated regions of the Mid-City/Westside Study Area. As a requirement of satisfying FTA guidelines associated with New Starts Criteria, the number of households located within a 0.5-mile radius of proposed stations are identified in Table 3.4-2. Recent demographic data from SCAG found approximately 80,000 households located within this radius of Wilshire Boulevard in 1997.

Population increases around the Wilshire Boulevard Corridor transit stops are projected to parallel the population growth of 19 percent forecast for the Corridor study area as a whole. In contrast, employment growth around the transit stops is expected to be similar to the employment growth in the study area for all alternatives. Current SCAG demographic projections predict that growth around the Wilshire Boulevard Corridors would be slightly greater than the 15 percent anticipated for the entire Mid-City/Westside Corridor Study Area. This population density was compared to the overall county average to recognize the sizable differences that occur. It should be noted that many of the jurisdictions along the ROW, other than the MTA, are currently providing transit services (i.e., Los Angeles DOT, Santa Monica Blue Bus, Culver City Bus) to meet the needs of transit users. The Wilshire BRT Alternative would result in increased transit service, thereby increasing the mobility and convenience to the transit dependent population. Therefore, impacts to transit dependant populations would be beneficial as a result of Wilshire BRT implementation.

<u>Alternative 1A: Wilshire BRT (Median Adjacent Design Option)</u>

Effects on Local Businesses. Impacts associated with this alternative on business accessibility and visibility would be similar to those described above for Alternative 1 (Median Reconstruction Design Option). This alternative would result in a loss of current available on-street parking, therefore resulting in a possible loss of access to businesses along the route. Because the loss of parking would be the catalyst for any socioeconomic impact, the assessment of this particular impact is addressed in Section 3.3 (Parking) of this document, where the direct and indirect effects on any loss in parking associated with the alternatives is addressed.

Effects on Population. Impacts associated with this alternative on population would be similar to those described above for Alternative 1 (Median Reconstruction Design Option). Because this alternative would result in the same benefits to the public transportation system along Wilshire Boulevard, the effects on population would be the same. Impacts would be less than significant.

Increased Mobility for Transit-Dependent. Impacts associated with this alternative on increased mobility for transit-dependent populations would be similar to those described above for Alternative 1 (Median Reconstruction Design Option). Because this alternative would result in the same benefits to the public transportation system along Wilshire Boulevard, the resulting increase in transit services would be the same. Impacts would be beneficial.

<u>Alternative 1B: Wilshire BRT (Curb Adjacent Design Option)</u>

Effects on Local Businesses. Impacts associated with this alternative on business accessibility and visibility would be similar to those described above for Alternative 1 (Median Reconstruction Design

Option). This alternative would result in a loss of current available on-street parking, therefore resulting in a possible loss of access to businesses along the route. Because the loss of parking would be the catalyst for any socioeconomic impact, the assessment of this particular impact is addressed in Section 3.3 (Parking) of this document, where the direct and indirect effects on any loss in parking associated with the alternatives is addressed.

Effects on Population. Impacts associated with this alternative on population would be similar to those described above for Alternative 1 (Median Reconstruction Design Option). Because this alternative would result in the same benefits to the public transportation system along Wilshire Boulevard, the effects on population would be the same. Impacts would be less than significant.

Increased Mobility for Transit-Dependent. Impacts associated with this alternative on increased mobility for transit-dependent populations would be similar to those described above for Alternative 1 (Median Reconstruction Design Option). Because this alternative would result in the same benefits to the public transportation system along Wilshire Boulevard, the resulting increase in transit services would be the same. Impacts would be beneficial.

Alternative 2: Wilshire BRT and Exposition BRT (Full Length)

Effects on Local Businesses. The Exposition BRT Alternatives will have similar effects on the supply of on-street parking as the Wilshire BRT Alternative. Impacts associated with this alternative on business accessibility and visibility along both the Wilshire and Exposition routes would be similar to those described above for Alternative 1 (Median Reconstruction Design Option). This alternative would result in a loss of current available on-street parking, therefore resulting in a possible loss of access to businesses along the routes. Because the loss of parking would be the catalyst for any socioeconomic impact, the assessment of this particular impact is addressed in Section 3.3 (Parking) of this document, where the direct and indirect effects on any loss in parking associated with the alternatives is addressed.

Effects on Population. The Exposition BRT, as discussed in Section 2.0, also follow existing public ROWs, and are largely contained within existing limits of city streets or a former railroad ROW now owned by the MTA. As shown in Tables 3.4-3 and 3.4-5, the population within the Exposition ROW is significant, with 7 of the 20 stations containing a 1990 population greater than 1,000 persons within 0.5 of the station intersection. The Exposition BRT would result in an improvement to the public transportation system serving the area. This improvement, making the area more desirable, could result in an increase in population to the area. However, this increase is expected to be within the normal growth within the corridor and Los Angeles as a whole. Population growth within the vicinity of the route is limited to existing housing availability and market factors that are not directly related to the proposed transit improvements. No significant direct impact to population growth is expected to occur as a result of the proposed alternative. Impacts would be less than significant.

Increased Mobility for Transit-Dependent. As described under the evaluation of Wilshire BRT impacts on increased mobility for transit-dependant users, the concentration of activity centers in the study area has a corresponding impact on corridor travel characteristics.

According to SCAG growth forecasts, population increases around the Exposition Corridor transit stops are expected to increase by about 26 percent, while the Wilshire BRT Corridor is expected to parallel the population growth of 19 percent forecast for the Corridor study area as a whole. In contrast, employment growth around the transit stops is expected to be similar to the employment growth in the study area for all alternatives.

Similar to the Wilshire Boulevard Corridor, the Exposition Corridor traverses densely populated regions of the Mid-City/Westside study area. As a requirement of satisfying FTA guidelines associated with New Starts Criteria, the number of households located within a 0.5-mile radius of proposed stations were identified in Table 3.4-5. Recent demographic data from SCAG found approximately 75,000 households were located within this radius for the Exposition Corridor in 1997. This figure is projected to rise to 97,000 by 2020. As shown previously in Figure 3.4-1, the respective population density for these same time periods along each corridor when compared to the overall county average recognizes a sizable difference.

It should be noted that many of the jurisdictions along the ROW, other than the MTA, are currently providing transit services (i.e., Los Angeles DOT, Santa Monica Blue Bus, Culver City Bus) to meet the needs of transit users. The Wilshire BRT and Exposition BRT Alternative would result in increased transit service, thereby increasing the mobility and convenience to the transit dependent population. Therefore, impacts to transit dependant populations would be beneficial as a result of implementation of Alternative 2.

Alternative 2A: Wilshire BRT and Exposition BRT (MOS)

Alternative 2 would be a combination of the Wilshire BRT, and the full length of the Exposition BRT described in Section 2.0 (Alternatives Considered). There are 20 stations proposed for the Exposition BRT (see Table 3.4-1). The Exposition BRT MOS component of Alternative 2 would terminate at the Venice/Washington Station. Given that Wilshire BRT impacts have been disclosed above, and that the MOS option of the Exposition BRT is only a shorter route of the full length alternative, the impact evaluation for Alternative 2 provides an evaluation of impacts for the full length of Exposition BRT. To avoid repetition, the impacts associated with Alternative 2A would be similar to those of Alternative 2. It should be noted that with the Exposition BRT MOS, any impacts to neighborhoods west of the Venice/Washington Station would not occur. While the scale of impacts would be decreased due to the shorter route, potential impacts to local businesses as a result of loss of on-street parking are still expected on the businesses located within the MOS route. These potential impacts are discussed in Section 3.3 (Parking) of this document. Furthermore, less than significant impacts are expected on population and beneficial effects would occur for the transit dependent population contained within.

Alternative 3: Wilshire BRT and Exposition LRT (Full Length)

Effects on Local Businesses. Businesses could be impacted by the loss of parking along some portions of the Exposition Corridor, as well as narrowing sidewalks to accommodate a busway. As shown in Tables 3.4-3 and 3.4-4, the population and employment within the Exposition ROW was significant in 1990, totaling 148,399 persons with 70,864 employed. As shown in Table 3.4-1 (Land Use), the majority of the Exposition ROW is adjacent to various types of business activities that encompass industrial, light industrial and manufacturing, and commercial land uses, such as offices and retail stores. The highest concentration of these businesses is located along the western portion of the Exposition Corridor in Santa Monica. The remainder of the corridor has high mix of different land use types including businesses. This type of access impediment would likely be most problematic within areas where businesses are highly dependent on on-street parking along the Venice to Sepulveda Boulevards segment of the Corridor. This alternative would result in a loss of current available on-street parking, therefore resulting in a possible loss of access to businesses along the routes. Because the loss of parking would be the catalyst for any socioeconomic impact, the assessment of this particular impact is addressed in Section 3.3 (Parking) of this document, where the direct and indirect effects on any loss in parking associated with the alternatives is addressed.

Effects on Population. As discussed in Section 2.0, this alternative also follows existing public ROWs and is largely contained within existing limits of city streets or a former railroad ROW now owned by the MTA. As shown in Tables 3.4-3 and 3.4-4, the population within the Exposition ROW was significant in 1990 totaling 148,399 persons. This alternative would result in an improvement to the public transportation system serving the area. This improvement could result in an increase in population to the area as a result of the improvements making the area more desirable. However, this increase is expected to be within the normal growth within the corridor and Los Angeles as a whole. Population growth within the vicinity of the route is limited to existing housing availability and market factors that are not directly related to the proposed transit improvements. No significant direct impact to population growth would occur as a result of the proposed alternative. Impacts would be less than significant.

Increased Mobility for Transit-Dependent. Given that Wilshire BRT impacts have been disclosed above, and that the MOS option of the Exposition BRT is a shorter route of the full length alternative, the beneficial impacts associated with the evaluation conducted for the Exposition LRT are identical to those impacts for the full length of Exposition LRT. To avoid repetition, the reader is referred to the analysis presented above for Alternative 2.

Alternative 3A: Wilshire BRT and Exposition LRT (MOS)

Alternative 3 would be a combination of the Wilshire BRT, and the full length of the Exposition LRT described in Section 2.0 (Alternatives Considered). The light rail transit system along the Exposition corridor would consist of 16 stations (see Table 3.4-1). The Exposition LRT MOS component of Alternative 2 would terminate at the Venice/Washington Station. Given that Wilshire BRT impacts have been disclosed above, and that the MOS option of the Exposition LRT is only a shorter route of the full length alternative, the impact evaluation for Alternative 3 provides an evaluation of impacts for the full length of Exposition LRT. To avoid repetition, the impacts associated with Alternative 3A would be similar to those of Alternative 3. It should be noted that with the Exposition LRT MOS, any impacts to neighborhoods west of the Venice/Washington Station would not occur. While the scale of impacts would be decreased due to the shorter route, potential impacts to local businesses as a result of loss of on-street parking are still expected on the businesses located within the MOS route. These potential impacts are discussed in Section 3.3 (Parking) of this document. Furthermore, less than significant impacts are expected on population and beneficial effects would occur for the transit dependent population contained within.

Maintenance Yard

A facility will be required for infrastructure and bus maintenance within the vicinity of both routes. Several locations are proposed for possible maintenance yards:

- NW Corner of Chavez/Mission;

- Existing MTA Division I area;
- NE Corner Alameda/Washington;
- SE Corner Alameda/Washington;
- Exposition ROW Hooper to Central; and
- Existing MTA South Park Shops.

Figures 2-17 - 2-19 (Section 2.0, Alternatives Considered) show the locations and physical layout of the proposed maintenance facilities. These locations are all contained within lands currently owned and operated by the MTA. Development of any maintenance facilities within these locations would not cause any increase in current population, nor would it result in the displacement of any residential units. There are no businesses, which would be impacted by either construction or operations of transit maintenance facilities within these lands. Transit operations would not be impacted by any activities associated with the construction or operation of the proposed maintenance facilities. Therefore, because the proposed maintenance facilities are within lands currently owned by the MTA, socioeconomic impacts associated with the construction and operation of any proposed maintenance facilities would be less than significant.

Subway Design Option at USC/Exposition Park (for Alternatives 2, 2A, 3, and 3A)

The subway design option would provide a subterranean travel corridor within the right-of-way for either bus or light-rail transit options. Socioeconomic impacts associated with a subterranean travel route are minimal due to the negligible disruption to at-grade businesses and parking. Short-term impacts to local businesses could be anticipated during construction phases, however, business accessibility and visibility would likely not occur. Impacts to population and transit dependent populations would be identical to those discussed above for Alternatives 2, 2A, 3, and 3A.

3.4.4 Cumulative Impacts

The 1998 RTP Draft Master EIR (SCAG, 1997), which is hereby incorporated by reference, provides the cumulative context for analysis of the Mid-City/Westside Transit Corridor Project. The 1998 RTP Draft Master EIR provides a programmatic analysis of socioeconomic impacts resulting from implementation of all projects contemplated in the RTP (SCAG, 1998), including the Mid-City/Westside Transit Corridor project, and provides the basis for this cumulative impact analysis.

Cumulative socioeconomic impacts could result from an increase in population beyond SCAG projections. Projects included in the RTP are intended to increase the overall accessibility and mobility of persons within the SCAG region. These improvements could result in an increase in population to the area, making the area more desirable. However, this increase is expected to be within the normal growth projected by SCAG within the RTP. Furthermore, population growth within the region is limited to existing housing availability and market factors that are not directly related to the proposed improvements included within the RTP. No cumulative population growth is expected beyond that projected by SCAG as a result of the proposed projects included within the RTP. Impacts would be less than significant.

Cumulative socioeconomic impacts could also result from construction activities associated with proposed RTP projects that could impede local business vitality. Projects contemplated in the RTP that do not require the construction of new facilities (e.g., optimization of the existing transportation system) would not have a direct physical effect on business visibility or accessibility. The indirect effects of reducing traffic congestion would be beneficial to local businesses in the region, because reductions in traffic would increase the level of accessibility and parking for patrons. Those projects that require construction of new or expanded facilities (e.g., additional parking facilities) would potentially have the greatest adverse impacts, because construction activities associated with the infrastructure could damage local business visibility and accessibility during the short-term. This type of access impediment is most problematic within SCAG urban areas where businesses are highly dependent on on-street metered parking. When evaluated on a cumulative level, the projects contained within the RTP could result in a loss of current available on-street parking, therefore resulting in a possible loss of access to businesses along the routes. Because the loss of parking would be the catalyst for any socioeconomic impact, the assessment of this particular impact is addressed in Section 3.3 (Parking) of this document, where the direct and indirect effects on any loss in parking associated with the alternatives is addressed.

3.5 Land Use/Neighborhoods

3.5.1 Introduction

The purpose of this section is to provide baseline data on the existing land use characteristics of the study area; to assess whether the proposed project is consistent with applicable land use plans and policies; and to identify any potentially significant land use changes resulting from implementation of the proposed project. Section 4.7 provides an evaluation of minority and low-income populations that may potentially be affected by implementation of transit services in the Mid-City/Westside Corridor. This evaluation is in accordance with Executive Order 12898 on Environmental Justice. Section 6.0 provides a description of the public involvement program for the proposed project.

3.5.2 Affected Environment

This section provides a discussion of existing land uses along the proposed Wilshire and Exposition project routes and highlights the pertinent land use regulations currently in place. Sensitive land uses (e.g., schools, recreational areas, religious buildings) within or adjacent to the study corridors are also identified. The discussion of existing land uses is based on an evaluation of Thomas Guide street maps, Metropolitan Los Angeles Central and Western Area street map, aerial photographs, and field reconnaissance conducted by EIP Associates in the fall of 2000.

Existing Land Use

The Mid-City/Westside Transit Corridor Project study area is located on the Westside of Los Angeles County and encompasses approximately 112 square miles. The study area is roughly bounded by the Pacific Ocean on the west; Sunset Boulevard and the Hollywood Freeway (US 101) on the north; Hope Street and Figueroa Street on the east; and Slauson/Manchester Boulevards on the south. The study area includes portions of the City of Los Angeles, unincorporated areas of Los Angeles County (Baldwin Hills, Sawtelle), and the Cities of Beverly Hills and Santa Monica. Several key factors of the study area development include:

- Population and employment densities in the Mid-City/Westside study area are the highest within the Los Angeles Metropolitan region.

- The study area contains the largest concentration of major activity centers within the Los Angeles Metropolitan region.

- Opportunities for residing and working within the corridor have generated transit mode splits 2.5 times higher than the regional mode split (8.0 percent for the corridor versus 3.2 percent for the region).

Land uses throughout the study area vary substantially, including a broad mix of residential, commercial, office, and retail uses, with several vacant/undeveloped lots interspersed among these uses. While certain portions of each of the proposed corridors could be described as having their own specific character, overall land use patterns are generally similar to those found throughout the west Los Angeles area. The two corridors have different characters, with Wilshire Boulevard having higher density uses in comparison to Exposition as illustrated by the following text and graphic depictions:

- Figure 3.5-1 presents the existing land uses and land use patterns of the Mid-City Westside Corridor Study area. In addition, proposed station locations for all of the alternatives considered are provided with a graphic depiction of the 0.5-mile radius around each station location;

- Table 3.5-1 provides a list of existing land uses and land use types, neighborhoods, schools, and destination and activity centers in close proximity to the Corridor study area; and

- Figure 3.5-2 provides the location and types of proposed stations for the alternatives considered along with existing activity centers in the Mid-City/Westside Corridor Study area.

As discussed in Section 3.5 (Socioeconomics) and the Mid-City/Westside Corridor Study Area Major Investment Study (incorporated by reference into this EIS/EIR), population and employment densities in the Mid-City/Westside study area are the highest within the Los Angeles metropolitan region, averaging approximately 13,883 persons per square mile and 9,167 employees per square mile. The more densely populated areas are concentrated in the east and northwestern portion of the study area, while the greatest employment densities are in the western and northwestern portion of the study area.

In addition, the Mid-City/Westside Corridor study area contains the largest concentration of major activity centers and destinations (i.e., high trip generators) within the Los Angeles metropolitan region (see Figure 3.5-2). Many of these activity centers are located within the most congested portion of the study area north of the Santa Monica Freeway (I-10) and east of the San Diego Freeway (I-405). Of all the areas within the Los Angeles metropolitan area, the Mid-City/Westside study area best exemplifies the “Centers Concept.” The Centers Concept is a land use-planning concept from the City of Los Angeles General Plan that views the urban area not as a central downtown but rather a collection of urban centers. This concept is discussed in more detail below under Applicable Plans and Policies. The major destinations in the Mid-City/Westside study area correspond with the location and number of activity centers planned for in the Centers Concept.

Not only does the study area encompasses the western portion of the traditional/historical downtown area, but it also encompasses the most well-known employment, entertainment, educational, and cultural activity centers in the Los Angeles region. The study area contains 64 major centers and key attractions described in Table 3.5-1 and depicted graphically in Figure 3.5-2.

Currently, the portion of the Metrorail Red Line subway system built or under construction to date only interconnects a small portion of the centers in the eastern portion of the study area, such as downtown to Hollywood to Universal City and to Mid-Wilshire. The remaining centers are served by two major freeways (Interstate 10 – Santa Monica Freeway, and Interstate 405 – San Diego Freeway), as well as by less than a dozen major east-west and north-south arterials.

Figure 3.5-1 Existing Land Use Within the Study Area

Figure 3.5-2 Proposed Station Locations and Existing Activity Centers

The concentration of activity centers in the study area has a corresponding impact on corridor travel characteristics. In 1998, the study area had nearly 8.5 million daily person trips, of which 2.3 million, or 27.5 percent are home to work trips, and over 675,000, or 8 percent, are made on transit. This compares to the five county Southern California MTA Modeling Area trips of 10.3 million two-way home to work trips, or 20.3 percent, and almost 1.6 million, or 3.2 percent, of the daily trips that are made on transit.

TABLE 3.5-1
STUDY CORRIDOR LAND USES

Existing Conditions						Proposed Conditions	
Corridor Segment	**Jurisdiction**	**Land Uses Along Corridor**	**Destination and Activity Centers**	**Affected Neighborhoods**	**Schools Within 0.5 Mile of Corridor**	**Station Locations**	**Park-and-Ride Facilities/ Replacement Parking Facilities**
Wilshire Corridor							
Western Ave. to Wilton Pl.	City of Los Angeles	Office, Retail	Metro Red Line Western Station, Koreatown	Koreatown, Wilshire Center	Hobart Blvd. Elementary School, Silvan Special Education Center, Berendo Middle School, Leo Politi Elementary School, Hoover Elementary, Wilton Place Elementary	Western Ave.	None
Wilton Pl. to Highland Ave.	City of Los Angeles	Office, Multi-Family Residential	Several churches, a temple, Hancock Park, Los Angeles High School, Burroughs Middle School, two libraries, several parks	Mid-Wilshire, Country Club Park (to the south), Hancock Park	3rd Street Elementary, Alta Loma Elementary, Arlington Heights Elementary, Burroughs Middle School, Los Angeles Senior High, Mt. Vernon Middle School, Pico Elementary, Queen Anne Elementary	Crenshaw Blvd.	Crenshaw Blvd., 158 spaces
Highland Ave. to Hauser Blvd.	City of Los Angeles	Office, Retail		Mid-Wilshire, Hancock Park, Miracle Mile	Wilshire Crest Elementary	La Brea Ave.	La Brea Ave., 129 spaces
Hauser Blvd. to Fairfax Ave.	City of Los Angeles	Museum District, Office, Retail	Museum Row, Hancock Park, the Los Angeles County Museum of Art, George Page Museum, Petersen Automotive Museum, Kaye Museum of Miniatures, and the Rancho La Brea Tar Pits, CBS Television Center, the Los Angeles Farmer's Market, Pan Pacific Park	Miracle Mile, Park La Brea	Saturn Street Elementary, Hancock Park Elementary, Fairfax High School	Fairfax Ave.	None

TABLE 3.5-1
STUDY CORRIDOR LAND USES

Existing Conditions						Proposed Conditions	
Corridor Segment	**Jurisdiction**	**Land Uses Along Corridor**	**Destination and Activity Centers**	**Affected Neighborhoods**	**Schools Within 0.5 Mile of Corridor**	**Station Locations**	**Park-and-Ride Facilities/ Replacement Parking Facilities**
Fairfax Ave to Santa Monica Blvd.	City of Los Angeles, City of Beverly Hills	Retail, Office, Institutional, Recreation	Beverly Center, La Cienega Park, the Center for Motion Picture Study, Beverly Hills City Hall, police and fire departments, Beverly Hills Library, the Beverly Center; Cedars-Sinai Hospital and Medical Center, Melrose Avenue, the Pacific Design Center, Museum of Tolerance	Miracle Mile, Carthay Circle, Carthay Square South, Beverly Roxbury, Beverly Hills	Canfield Elementary, Carthay Center Elementary, Crescent Heights Boulevard Elementary, Beverly Hills High School, Horas Man Elementary School	La Cienega Blvd., Robertson Blvd., Beverly Dr., Santa Monica Blvd.	None
Santa Monica Blvd. to Comstock Ave.	City of Los Angeles, City of Beverly Hills	Low- to Mid-Rise	Los Angeles Country Club, Rodeo Drove, Beverly Hills	Beverly Hills, Century City	Warner Elementary, Hawthorne Elementary School	None	None
Comstock Ave. to Veteran Ave.	City of Los Angeles	Open Space, Office, Residential	Westwood Village, UCLA and UCLA Medical Center, the Armand Hammer Museum	Westwood, Boulevard Heights	Emerson Middle School, Fairburn Elementary	Westwood Village	None
Veteran Ave. to Federal Ave.	City of Los Angeles	Institutional, Retail, Office	Veterans Administration and Hospital, Wadsworth Theater and Brentwood Village	West Los Angeles		None	None
Federal Ave. to Ocean Ave.	City of Los Angeles, City of Santa Monica	Retail, Office	St. John's Hospital and Medical Center, Third Street Promenade, Santa Monica Pier, Pacific Ocean	West Los Angeles, Brentwood Village, Santa Monica	Brockton Elementary, University High School, Roosevelt Elementary School, Franklin School, Lincoln Middle School, Santa Monica College	Barrington Ave., Bundy Dr., 14th St., 4th St.	None

TABLE 3.5-1
STUDY CORRIDOR LAND USES

Existing Conditions						Proposed Conditions	
Corridor Segment	**Jurisdiction**	**Land Uses Along Corridor**	**Destination and Activity Centers**	**Affected Neighborhoods**	**Schools Within 0.5 Mile of Corridor**	**Station Locations**	**Park-and-Ride Facilities/ Replacement Parking Facilities**
Exposition Corridor							
Flower St. from Washington Blvd. to Exposition Blvd.	City of Los Angeles	Industrial, Office	Los Angeles Civic Center, Downtown Los Angeles, Staples Center, Los Angeles Convention Center, Shrine Auditorium, Mt. St. Mary's College, Hebrew Union College	Jefferson Park, West Adams District, Exposition Park	10th Street Elementary, Adams Middle School, Norwood Elementary, Trinity Street Elementary, 28th Street Elementary, Trinity Street Children's Center, Friedman Adult High School	Figueroa St./Adams Blvd. (BRT), Figueroa St./ Jefferson Blvd. (BRT), USC Exposition Park (LRT)	
Figueroa St. to Vermont Ave.	City of Los Angeles	Institutional, Commercial, Retail, Mixed single- and multi-family residential, Recreational	University of Southern California, Exposition Park, The Mosque, Los Angeles Sports Arena, Los Angeles, Science Center, IMAX Theater, Natural History Museum of Los Angels County, Aerospace Museum, Museum of Science and Industry	Exposition Park	Menlo Avenue Elementary	Vermont Ave.	
Vermont Ave. to Arlington Ave.	City of Los Angeles	Commercial, Retail, Single- and Multi-Family Residential	West Adams District	Exposition Park, Jefferson Park, West Adams	Weemes Elementary, King Jr. Elementary, Manual Art High School, Salvin Special Education Center, Mid City High School, Widney High School, James A. Foshay Junior High School	Normandie Ave. (LRT), Western Ave.	
Arlington Ave. to Farmdale Ave.	City of Los Angeles	Single- and Multi-Family Residential, Commercial, Light Industrial, Recreational	Baldwin Hills Crenshaw Plaza Mall, Santa Barbara Plaza, Liemert Park, Magic Johnson Theaters	Jefferson Park, Crenshaw, Leimert Park, Baldwin Hills	Virginia Road Elementary, Dorsey High School, Coliseum Street School, Tom Bradley School, Audobon Middle School	Crenshaw Blvd.	Crenshaw Blvd. (BRT/LRT) 400 spaces

TABLE 3.5-1
STUDY CORRIDOR LAND USES

Existing Conditions						Proposed Conditions	
Corridor Segment	**Jurisdiction**	**Land Uses Along Corridor**	**Destination and Activity Centers**	**Affected Neighborhoods**	**Schools Within 0.5 Mile of Corridor**	**Station Locations**	**Park-and-Ride Facilities/ Replacement Parking Facilities**
Farmdale Ave. to Robertson Blvd.	City of Los Angeles, City of Culver City	Industrial, Light Industrial, Retail, Commercial, Office, Institutional, Single- and Multi-Family Residential, Recreational	Dorsey High School, Rancho Cienega Sports Center, Baldwin Hills Recreation Center, Kenneth Hahn State Recreational Area	Crenshaw, Culver City, Mid-City, South of Robertson, Pico Neighborhood, Hayden Tract, Baldwin Hills	Cienega Elementary, Castle Heights Elementary, Crescent Heights Boulevard Elementary, Hamilton Senior High School-Complex, Marvin Avenue Elementary, Shenandoah Elementary, Echo Horizon School,	La Brea Blvd., La Cienega Blvd., National/Hayden (BRT), Venice Blvd./Washington Blvd. (LRT)	La Brea Blvd. (BRT/LRT) 41 spaces La Cienega (BRT/LRT) 363 spaces
Venice Blvd. from Washington Blvd. to Motor Ave.	City of Los Angeles, City of Culver City	Retail, Industrial, Commercial, Institutional, Single- and Multi-Family Residential	Downtown Culver City, Culver City Hall, police and fire departments, Brotman Medical Center, Culver Studios, Sony Studios, Culver Center , West Los Angeles College	Culver City, Palms, Cheviot Hills, Rancho Park	Palms Elementary	Venice Blvd./Main (BRT)	Venice Blvd./Washington Blvd. (LRT) 612 spaces
Motor Ave. to Sepulveda Blvd.	City of Los Angeles	Commercial, Retail, Multi-Family Residential	Westside Pavilion, Cheviot Hills Park and Recreation Center, 20th Century Fox Studios, Notre Dame Academy	Cheviot Hills, Rancho Park, West Los Angeles	Palms Middle School, Charnock Road School,	Venice Blvd./Overland Ave., Venice Blvd./Sepulveda Blvd.	
Sepulveda Blvd. to Olympic Blvd.	City of Los Angeles	Industrial, Office, Retail, Multi-Family Residential		Sawtelle District, West Los Angeles, Mar Vista	Charnock Road School, Clover Avenue Elementary, Mar Vista Elementary, Overland Avenue Elementary, Warner Elementary, Webster Middle School, Westwood Elementary, Richland Avenue School	Sepulveda Blvd./National Blvd./ Pico Blvd./Sawtelle Blvd.	Pico Blvd./Sawtelle Blvd (BRT/LRT) 565 spaces
Olympic Blvd. to 20th Street	City of Santa Monica	Industrial, Office, Institutional	Santa Monica Studios, Bergamot Station, Water Garden Tower, MGM Plaza, MTV, St. John's Hospital and Medical Center, Santa Monica Municipal Airport	West Los Angeles, Santa Monica	Sterry Elementary, Warner Elementary, Grant Elementary School, Richland avenue School	Bundy Dr., Cloverfield Blvd.,	Bundy Dr. (BRT/LRT) 372 spaces Cloverfield Blvd. (BRT/LRT) 1,140 spaces

TABLE 3.5-1
STUDY CORRIDOR LAND USES

Existing Conditions						Proposed Conditions	
Corridor Segment	**Jurisdiction**	**Land Uses Along Corridor**	**Destination and Activity Centers**	**Affected Neighborhoods**	**Schools Within 0.5 Mile of Corridor**	**Station Locations**	**Park-and-Ride Facilities/ Replacement Parking Facilities**
20th Street to Ocean Ave.	City of Santa Monica	Industrial, Retail, Office	Santa Monica College, Woodlawn Cemetery, 3rd Street Promenade, Santa Monica Place, Santa Monica High School, Ocean Avenue, the California Incline, Palisades Park, Pacific Coast Highway, Santa Monica Pier, Santa Monica Beaches, Santa Monica Civic Center, Santa Monica Civic Auditorium, Los Angeles County Superior Court	Santa Monica, Ocean Park, Light Manufacturing Studio District (LMSD)	Crossroads School, Santa Monica High School, Santa Monica College, Will Rogers Elementary	Colorado Ave./14th St. (BRT), Ocean	Ocean Ave./Colorado Ave. (LRT) 100 spaces

When compared to the region as a whole, the study area has a higher percentage of work trips (by 7 percentage points) of all daily trips. This is a reflection of relatively higher population density, as well as an abundance of employment opportunities in the study area. The more notable observation is the significantly higher transit percentage for the study area trips compared to the overall regional transit percentage. The study area's percent transit mode split is 2.5 times higher than the regional 3.2 mode split. This is a clear indication of two characteristics related to the study area: high transit dependency in certain study area communities and relatively high levels of transit services, which are provided in the study area.

Wilshire Corridor

Wilshire Boulevard is a densely developed corridor, with commercial development fronting both sides of the Corridor and the intersecting north/south streets, and single- and multi-family residential surrounding the commercial uses. Traveling west from the Western Metro Red Line Station, the Wilshire Boulevard frontage contains numerous high-rise (20 stories) and mid-rise (8-10 stories) office buildings. Mixed in with the office buildings are numerous low-rise (2-5 stories) commercial office and retail structures. A relatively small proportion of the land uses along the corridor are dedicated to surface parking lots; most parking along Wilshire Boulevard is structured or street parking. Wilshire Boulevard west of Santa Monica Boulevard contains a high concentration of high-rise condominiums. The Westwood area of the corridor also contains high concentrations of high-rise office buildings. West of the Westwood area, the Corridor contains some high-rise office buildings through the Bundy Station area, but predominantly 2-4-story commercial retail buildings for the remainder of the Corridor. The station areas all intersect major north-south streets; almost all of which also contain high concentrations of commercial and retail land uses fronting onto both sides of the streets. Educational and institutional uses (universities, schools, and hospitals) are found throughout the study area. Figure 3.5-1 and Table 3.5-1 provide detailed descriptions of land uses along this study corridor.

Exposition Corridor

The Exposition study corridor contains single-family residential uses, with some low-rise, multi-family dwelling units lining the ROW. Along the eastern portion of the corridor the areas surrounding the ROW to the north and south also consist of some multi-family units interspersed among single-family uses. Neighborhood commercial uses in "strip malls" are present at most main intersections. The eastern and western portions of the corridor can be considered pedestrian-friendly, given the ease of access to the institutional uses and destinations via existing, extra-wide sidewalks and signalized crosswalks. The central portion of the corridor contains primarily industrial uses and is considered auto-oriented. This portion of the corridor contains narrower sidewalks, present on one side only, making this segment less pedestrian-friendly. Table 3.5-1 provides a detailed description of land uses along this study corridor.

Applicable Plans and Policies

Development of an extension of the regional transit system into the Westside has been discussed for years. In anticipation of its eventual implementation and in recognition of the potential shifts in land use and transportation patterns, long-range planning documents developed by jurisdictions on the Westside during this decade have attempted to account for a transit system. Those plans include policies to accommodate and support fixed-guideway and more intensive bus transit. Jurisdictions affected by the Wilshire Boulevard ROW include the Cities of Los Angeles, Beverly Hills, and Santa Monica. Jurisdictions affected by the Exposition ROW include the Cities of Los Angeles, Culver City, and Santa Monica. The transit-supporting policies of these potentially affected jurisdictions are summarized below, and are followed by a brief discussion of consistency of a transit system on the Westside with those policies.

State and Regional Framework

Land use patterns have a direct impact on the efficiency and desirability of transit in an urban environment. Worsening congestion within the Mid-City/Westside Study Area led the MTA to consider adding Westside transit corridors to the emerging fixed-guideway transit system. As a result, long-range planning policy documents from Westside cities have addressed the importance of linking land use development patterns, densities, and urban form surrounding the potential alignments and station locations to city policies that support and encourage the use of transit.

State of California. State Assembly Bill 670 (1999) provides certain transportation districts in the Bay Area of Northern California with the ability to acquire property for transit-oriented joint developments. These developments include commercial, residential, or mixed-use development projects in connection with existing, planned, or proposed transit facilities within one-quarter mile of transit facilities, subject to local land use and zoning regulations. This legislation recognizes the importance of supporting transit with more intensive transit-oriented land uses and the need for changes in existing land use to accommodate and support transit facilities. Therefore, development of a transit system within the Study Corridor would be consistent with this legislation.

SCAG. The primary transportation planning document affecting the Westside region is the Southern California Association of Government's (SCAG) Regional Transportation Plan (RTP), adopted on April 26, 1998. Earlier iterations of the RTP included a more extensive railway network, including an extension into the Westside from the east and an extension of the Green Line from the south. Because of funding constraints that required prioritization of lines within the region, these extensions are not included in the RTP. The RTP, along with MTA's State Congestion Management Programs (CMPs) and Caltran's Regional Transportation Improvement Program (RTIP), provide the overall framework for transportation improvements on the Westside.

Based on SCAG's review of this project during the scoping process for this EIS/EIR, the proposed project is consistent with the following:

- Growth Management Chapter (applicable sections: 3.01, 3.03] of the Regional Comprehensive Plan and Guide policies, and Regional Growth Forecasts that reflect 1998 RTP Population, Household, and Employment SCAG forecasts for Westside cities and City of Los Angeles subregions.

- Regional Transportation Plan (applicable sections: 4.01, 4.02, 4.03, 4.04, 4.06, 4.11, 4.15. 4.16) links the goal of sustaining mobility with the goals of fostering economic development, enhancing the environment, reducing energy consumption, promoting transportation-friendly development patterns, and encouraging fair and equitable access to residents affected by socio-economic, geographical and commercial limitations.

- GMC Policies (applicable sections: 3.04, 3.05, 3.08, 3.09, 3.10) related to the RCPG goal to improve the regional standard of living; Growth management goals to develop urban forms that enable individuals to spend less income on housing cost that minimize public and private development costs, and that enable firms to be more competitive, strengthen the regional strategic goal to stimulate the regional economy.

- GMC Policies (applicable sections: 3.11-3.23) related to the RCPG goal to improve the regional quality of life; Growth management goals to attain mobility and clean air goals and to develop urban forms that enhance quality of life, that accommodate a diversity of life styles, that preserve open space and natural resources, and that are aesthetically pleasing and preserve the character of communities, enhance the regional strategic goal of maintaining the regional quality of life.

- GMC Policies (applicable section: 3.27) related to the RCPG goal to provide social, political, and cultural equity. Growth Management goals to develop urban forms that avoid economic and social polarization promotes the regional strategic goal of minimizing social and geographic disparities and of reaching equity among all segments of society.

City of Los Angeles General Plan Framework

Policies adopted by the City of Los Angeles direct future population and employment growth in proximity to rail and bus transportation corridors. The *Citywide General Plan Framework,* an Element of the *City of Los Angeles General Plan*, adopted in 1996, allocates the majority of growth within one-quarter mile of transit stations and corridors. Approximately two thirds of the overall City's growth for 2010 is targeted as intensification and reuse of areas within and adjacent to the City's existing primary transportation corridors, while preserving lower density residential neighborhoods and neighborhood commercial districts in areas surrounding these corridors. The intensification and mix of uses are intended to enhance walkability of neighborhoods and districts and enhance access to public transportation.

More specifically, the applicable community plans address policies for communities along the transit corridors. These goals support public transit and use of the transit corridors to improve levels of service between Downtown Los Angeles and Santa Monica. Applicable Community plans include West Los Angles, Palms-Mar Vista, Brentwood-Pacific Palisades, and Wilshire. The transit-supporting goals of these Community Plans are summarized below:

- Develop a public transit system that improves mobility with convenient alternative to auto travel;
  - Coordinate with MTA and LADOT to improve express and local bus services to and within the community
  - Develop an intermodal mass transportation plan to implement linkages to future mass transit service

- Encourage alternative modes of Transportation over the use of single occupant vehicles to reduce vehicular trips;

- Provide a system of efficient and attractive bicycle and pedestrian routes;

- Encourage the safe utilization of easement and or right-of-way along flood control channels, public utilities, railroad rights-of-way, and streets wherever feasible for the use of bicycles and or pedestrians.

Transit corridors and stations are planned for high density and mixed-use development that function as destinations for transit users (e.g., jobs, entertainment, and culture) and contain a high number of residents that can conveniently use transit. The following are summary themes of the General Plan Framework:

- High-density uses abutting transit are planned to be developed to enhance pedestrian activity along the street frontages through architectural design, streetscape amenities, and restriction on non-pedestrian friendly uses.
- The development of transit stations can be used to enhance the pedestrian vitality and character of their environs through architecture, the creation of public places, streetscape, and activity.
- The development of transit stations can create distinct places that distinguish the location from the homogeneous pattern of surrounding land uses.
- Concentrations of high density, multi-family housing along transportation corridors are likely to contain a higher percentage of individuals who do not own automobiles, due to income or lifestyle choices.
- Traffic congestion can be reduced in the vicinity of high activity destinations by the provision of transit.

The intensification and mix of uses in the City of Los Angeles are intended to enhance walkability of neighborhoods and districts and enhance access to public transportation. The *City of Los Angeles General Plan Framework and Community Plans* correlate growth and transportation from two perspectives:

- Promoting the intensification of density and enhanced mix of uses in proximity to existing and planned transportation corridors and stations; and
- Establishing new transportation corridors in response to existing and planned high density, activity centers. Within this context, the Framework defines future growth areas as "Community Centers," "Regional Centers," "Downtown Center," and "Mixed Use Boulevards." In each, higher density commercial, office, and residential uses are permitted and standards specified to attain a high level of pedestrian activity. The Framework further advances the correlation of density with transportation through the designation of "Pedestrian Priority" and "Transit Priority" Highways.

The General Plan Framework recognizes Wilshire Boulevard as the primary east-west transportation corridor crossing the basin south of the Santa Monica Mountains. It is designated as a "Transit Priority Highway" and is flanked by some of the highest density designations in the City. The corridor passes through Regional Centers extending from Downtown to Wilton Place and from Highland Avenue to the City of Beverly Hills boundary (at San Vicente Boulevard). It is the Framework's objective that the enhancement of transit along this corridor would serve the existing high-residential density and activity centers (such as the museums), as well as provide an opportunity to enhance accessibility and revitalize the moribund commercial uses in the mid-Wilshire area. This corridor contains multiple existing and planned destinations that warrant multiple points of transit access. Therefore, development of transit within the Wilshire Boulevard ROW is **consistent** with the City of Los Angeles' General Plan and Community Plans.

Recognized as a future transit corridor, but not yet designated as a "Transit Priority Highway", is the Exposition Corridor. Because funding is being allocated to the Red Line and the Pasadena Blue Line, the Exposition Corridor, in the General Plan Framework, did not receive the attention that was given the Wilshire Boulevard ROW and the potential for the Red Line extension. It should also be noted that the Exposition Corridor has been historically a rail-served industrial corridor, but this service has not been active in the recent past. As such, it is not surprising that there are a number of residential areas that abut the railroad ROW, and there is an absence of major activity centers along its length. An exception is the University of Southern California/Exposition Park node located at its eastern edge. Therefore, although development of a transit system along the Exposition ROW is generally consistent with the City's policies, it is not viewed as favorable.

Beverly Hills General Plan

According to the City of Beverly Hills, initial preparation is underway to update the City's General Plan. A completed document is not expected until 2001. The existing General Plan Circulation Element was adopted in 1977 and includes discussion about the role of mass transit, which may be suitable as alternatives to the automobile. The General Plan assumes that any transit in the area would be grade-separated so as to not interfere with automobile traffic, and would be functionally and environmentally integrated into the existing community. The center of a system within the City would be in the vicinity of the Business Triangle along Wilshire Boulevard (Wilshire Alignment). The General Plan also contains numerous land use and transportation policies that are representative of strategies to attract and focus development in the Corridor and station areas demonstrating that, in general, high-density, mixed-use land uses are planned for within the station areas. These planned development policies reinforce the concept of infill development and concentrated or focused growth. Therefore, development of a transit system along the Wilshire Boulevard ROW generally would be consistent with the goals and policies of the City.

Santa Monica General Plan

The Santa Monica General Plan Land Use Element contains a variety of policies that encourage a concentration of land uses and activities that create activity during daytime and evening hours in the Downtown Area. These policies would be achieved by making the Downtown a primary location for commercial uses as a tourist destination, through the development of major entertainment or cultural uses, and by the creation of residential uses above ground level.

As an implementation program of its adopted transit policies, the City of Santa Monica operates the Big Blue Bus, a bus system serving an area from the Los Angeles World Airport to the south and the Getty Center, UCLA and Century City to the north.

Commercial corridors, such as Wilshire Boulevard and Olympic and Pico Boulevards (adjacent to and near the Exposition ROW), are designated to have intense garden office development (Olympic Boulevard east of 20th Street) in a Special Office District and development on Pico Boulevard to include high-density residential and service commercial. As an implementation measure, the Olympic Boulevard Corridor is designated to support future light rail through the joint development of commercial land uses at station locations. The area immediately adjacent to the Exposition Alignment is designated for preservation as linear public open space.

The Circulation Element encourages an improved public transit system capable of accommodating ten percent or more of the total trips generated by the City by 2000. This includes continued coordination with regional agencies, endorsement of rail transit, endorse the use of Wilshire Boulevard as a major bus transit corridor, the development of distinctive shuttles, bus shelters and the improvement of inter-modal coordination.

In addition, the City is currently in the process of updating its Zoning Ordinance to designate the MTA Transportation Corridor along Olympic Boulevard and Colorado Avenue a Transportation Preservation District to facilitate the development of transit along the Exposition ROW. A transit system along the Exposition ROW would ultimately connect to the proposed downtown Civic Center area. Therefore, development of transit along the Wilshire Boulevard and Exposition ROWs is consistent with the goals and policies of the City; however, transit along the Exposition ROW is more favored.

Culver City General Plan Update

The Culver City General Plan Update was adopted in 1996 and includes specific discussion about the Exposition Right-of-Way being developed as a fixed-guideway transit corridor. The Circulation Element directs that the City support expanded public transit service and ridership, but that support for the fixed-guideway is balanced against protection of existing established neighborhoods. Applicable goals, objectives, and measures outlined in the Circulation Element of the General Plan include the following:

- *Goal:* Integrate local and regional transportation systems that serve residential and business needs.

  Objective:

  (1a) Improve Traffic Flow and Reduce traffic congestion throughout the City;

  (2) Expand public transit service ridership;

  (3) Provide bikeway system that is safe and has enjoyable support facilities;

  (4) Provide convenient and pleasant pedestrian access;

  (6) Optimize parking availability;

  (7) Increase traffic safety and minimize traffic hazards and accidents;

- *Goal:* Protect residential neighborhoods that offer residents the qualities of a peaceful small-town environment;

  Objective:

  (8) Provide for the safe and efficient movement of people and goods while preserving, enhancing, or reclaiming the neighborhoods quality of life

- *Measure 3.* Continue Transportation Demand Management (TDM) that promotes the demand for alternative transportation by creating incentives to reduce overall auto trips.

- *Measure 4.* Adopt new Transit System Developments and Standards that reflect City policy and establish criteria for the development of transit facilities within the city.

- *Measure 5.* Adopt a Citywide Bikeway Plan that develops and identifies potential bikeways and sets standards for construction and support facilities.

In addition to adopted transit policies, the City of Culver City operates the Culver City Bus, a bus system of six routes serving an area from the Los Angeles World Airport to the south and UCLA and Century City to the north.

In anticipation of the development of the Exposition ROW, the City adopted policies prohibiting at-grade crossings and elevated guideway alignments near residential neighborhoods. Culver City policies include specific discussion about the Exposition ROW being developed as a fixed-guideway transit corridor, but that support for the fixed-guideway is balanced against protection of existing established neighborhoods. In order to facilitate and support transit, the City strives to encourage high trip-generating uses near transportation corridors, specifically encouraging and providing incentives for increased residential and commercial density for areas accessible to transportation facilities, and allows reduced parking requirements for land uses that share parking facilities. Therefore, development of the Exposition ROW with a transit system that is sensitive to preserving the neighborhood quality of life would be consistent with the goals and policies of Culver City.

3.5.3 Impact Assessment and Mitigation Measures

Standards of Significance

Land use impacts would be considered significant if the alternatives considered have the potential to cause:

- Incompatibility with adjacent and surrounding land uses caused by degradation or disturbances that diminish the quality of a particular land use;
- Physical division of an established community; or
- Inconsistency with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project.

Methodology for Impact Evaluation

Land use analyses in environmental assessment documents, such as this EIS/EIR, have two main components:

- Determination of potential short- and long-term conflicts with surrounding land uses resulting from project implementation; and
- Identification of potential inconsistencies with applicable land use plans, policies, and regulations.

The potential impacts of the alternatives considered will be evaluated using the standards of significance described above. These standards have been developed based on the requirements of NEPA and CEQA, and similar analyses conducted for transit projects.

Land Use Conflicts

The assessment of impacts on land use and neighborhoods focuses on the potential for land use incompatibility, degradation, or disturbance. Land use incompatibilities usually occur when the activities characteristic of a certain type of land use are considered undesirable and in conflict with activities associated with another type of land use. Incompatibilities tend to occur between disparate adjacent land uses. Various categories of land uses are considered disruptive or undesirable because they generate nuisances, while others are categorized as receptors because they are sensitive to nuisances generated by neighboring uses. In general, "nuisance" uses include those that generate substantial noise, odor, smoke, dust, air pollutants, nighttime illumination, or traffic. Typical categories of "sensitive" land uses include residences, hospitals, parks, schools, and convalescent homes. A basic tenet of land use planning is the separation or "buffering" of sensitive land uses (e.g., residences) from nuisance land uses (e.g., industrial uses).

Land use incompatibilities or degradation could also occur as a result of land use intensification. In other words, increasing the density or altering the character of a particular area could result in a change in land use patterns, thereby by affecting the quality of life of nearby neighborhoods. As a result, efforts to provide citizens with a heightened quality of life while providing public services, such as a transit system, make it important to reconcile the needs of both citizens and development to co-exist within a community. Development of transit alternatives represents an instance where it becomes especially important to reconcile these two needs, because although a transit project could result in land use incompatibilities, its basic intent is to serve the public through which it traverses. As such, the discussion of neighborhood effects attempts to discern impacts with respect to factors that are perceived to determine one's quality of life on a daily basis, including:

- The ability to access one's neighborhood easily;
- The general safety of the neighborhood with respect to traffic;
- The presence and ability to use neighborhood sidewalks;
- The width of streets and length of blocks;
- Landscaping;
- Vertical and horizontal alignments of streets;
- Average neighborhood vehicle speeds and the resident's perception of those speeds;
- Average volume of vehicles traveling through neighborhood streets and the resident's perception of those volumes;
- Level of noise generated by vehicles traveling through the neighborhood; and
- The types of vehicles, which traverse the streets.

Policy Consistency

Evaluation of policy consistency focuses on determining whether, or not, the development of a transit system within the Westside Study Corridor is consistent with the planning goals and policies of the jurisdictions that would be affected by, or would use, the transit system. In other words, in a policy consistency evaluation there are no differing levels in the degree of consistency with planning policies. Rather, a transit system either is, or is not, consistent with the general intent of a jurisdiction's planning document. Therefore, in contrast to the discussion of physical land use impacts, and the discussion of impacts provided in other technical subsections of Section 3.0 (Environmental Analysis), the evaluation of policy consistency is contained within a separate subsection (following physical land use impacts) and is presented in a different format – the evaluation of policy consistency focuses on the four jurisdictions through which the Wilshire Boulevard and Exposition ROWs traverse, versus by each of the alternatives considered.

Impacts

No Action Alternative (Baseline)

The No Action Alternative is comprised of the existing transit systems currently in use or expected to be in place in 2020 within the Westside Study Corridor. As described in Section 2.0 (Alternatives Considered), this includes improved frequencies on the Red, Blue, and Green rail lines and the expansion of MTA's bus service. Given that the MTA's transit services are consistent with existing and planned programs that have been evaluated in other environmental assessment documents, land use impacts are expected to be less than significant.

Construction Impacts. Since the No Action Alternative is consistent with existing and planned programs, construction impacts would be less than significant.

Transportation System Management (TSM) Alternative

The TSM Alternative is comprised of the No Action Alternative components with some bus service changes, including service frequencies, route extensions and truncations, simplification of route structures, and replacement of unproductive routes. Implementation of the TSM is intended to make the existing transit system on the Westside more efficient. As such, similar to the No Action Alternative, the TSM Alternative would have less than significant land use impacts.

Construction Impacts. The implementation of the TSM Alternative is consistent with existing and planned programs, and construction impacts are expected to be less than significant.

Alternative 1: Wilshire BRT (Baseline Median-Running)

Alternative 1 consists of a bus rapid transit system operating in the median of Wilshire Boulevard, from Western Avenue to downtown Santa Monica. Generally, the 14 stations proposed for this alternative would also be in the center median, the locations of which are described in Table 3.5-1, and Figures 3.5-1 and 3.5-2.

Land Use Compatibility

- Compatibility of Transit Operations and Stations. Sensitive receptors, such as residences and schools (described in Table 3.5-1) adjacent to Wilshire Boulevard and the proposed Wilshire BRT stations, would experience increased noise, air pollution, and traffic as a result of transit operations. However, in most cases, these uses are not located immediately adjacent to the Boulevard, but rather in the neighborhoods to the north and south of the Wilshire Boulevard Corridor. As part of the project design efforts, the BRT stations have been placed within the Wilshire Boulevard ROW away from sensitive receptors to help minimize disruptions to these land uses. In addition, as illustrated by Figure 3.5-3, many of the stations have been proposed near redevelopment areas in an effort to provide increased access to these areas. The ultimate success of redevelopment and revitalization of these areas largely rest on transportation accessibility and links to transit. Some improvements and strategies being employed – such as Santa Monica Boulevard improvements in West Hollywood and in Santa Monica – focus on increasing pedestrian amenities, and reducing or eliminating vehicular traffic, which places increasing demand on increased transit access and level of transit service to help support existing and future land use development objectives. Given that Wilshire Boulevard is currently a heavily traveled route in a highly urbanized area, transit operation and station impacts on land uses of the Wilshire Boulevard corridor would help the revitalization of redevelopment areas by providing transit, and would not considerably exacerbate existing land use conditions. In addition, consistent with applicable plans and policies, the development of a transit system along the dense Wilshire Corridor, is a compatible land use. Therefore, transit operations, such as the buses themselves, and stations for the Wilshire BRT Alternative are not expected to be incompatible with surrounding land uses. Transit operation and station compatibility impacts would be less than significant.

Nuisance impacts on sensitive receptors resulting from bus operations and stations are discussed in other applicable sections of the EIS/EIR (i.e., Sections 3.2-Traffic and Circulation, 3.3-Parking, 3.7-Visual Quality, 3.8-Air Quality, and 3.9-Noise and Vibration).

Compatibility of Park-and-Ride Facilities. As described in Table 3.5-1, park-and-ride lots are proposed at various locations along the Exposition Corridor. Impacts of these facilities would be similar to impacts of transit stations described above. No park-and-ride lots are proposed along the Wilshire Corridor; however, replacement parking will be provided in a manner consistent with the replacement parking strategy outlined in Section 3.3 (Parking) of this document. Overall, park-and-ride facility compatibility impacts would be considered less than significant.

Neighborhood Impacts

Accessibility to Key Community Facilities (Activity Centers)/Community Cohesion. The Wilshire Boulevard Corridor conveniently links a number of activity centers and much of the corridor is bounded by transit supportive uses as described in Table 3.5-1 and Figure 3.5-2. Table 3.5-2 indicates that nearly 4,500 acres of land within 0.5 mile of Wilshire Boulevard would be supportive of transit. This represents over 40 percent of the total land area adjacent to Wilshire Boulevard.

Figure 3.5-3 Redevelopment and Reinvestment Areas

TABLE 3.5-2
PERCENTAGE OF TRANSIT SUPPORTIVE LAND USE WITHIN 0.5 MILE OF WILSHIRE BLVD.

Land Use	Total Acres of Transit Supportive Land Uses	Acreage of Other Land Uses	% of Total Transit Supportive Land Uses
Commercial	705	1,339	34%
Institutional	610	--	100%
Higher Density Residential	2,760	622	81%
Regional Recreational	410	--	100%
Other Non-Supporting Uses	--	4,362	0%
TOTAL	**4,485**	**10,858**	**41%**

Source: SCAG 1994 and EIP Associates 1999

Although the Wilshire BRT alternative has the potential to alter the appearance of Wilshire Boulevard with the development of a dedicated bus lane and associated stations, it is not expected to disrupt a cohesive social unit, or divide an established neighborhood (i.e., those described in Table 3.5-1 and Figure 3.5-2), because the transit service would utilize an existing and historically heavily-traveled route between downtown Los Angeles and Santa Monica. Therefore, community cohesion impacts are expected to be less than significant.

Development of a transit system along the Wilshire Boulevard Corridor would help the land uses along this heavily used east-west route (between downtown Los Angeles and Santa Monica) become better linked. Uses considered to be supportive of transit include higher-density residential areas, intensive commercial and industrial developments that represent significant job centers, colleges and universities, institutional facilities (such as medical centers and civic centers), and regional recreational facilities. As shown by Table 3.5-1, the types of uses along Wilshire Boulevard are characteristically transit supportive. As such, it is desirable to serve these destinations with transit to enhance their accessibility from within and outside the Westside Corridor study area. Additionally, because of their intensity of development and/or level of activity (in terms of people coming and going), they are natural sources for transit riders. Therefore, development of the Wilshire BRT Alternative would be beneficial because it would provide new and increased accessibility to key Westside community facilities and activity centers.

<u>Neighborhood Character and Quality of Life</u>. The primary neighborhood concern regarding bus rapid transit on Wilshire Boulevard is the elimination of two lanes of travel (one in each direction) and the potential for a resultant overflow of traffic onto neighborhood streets. Businesses could be impacted by the loss of parking on Wilshire Boulevard. In addition, because the medians have recently been enhanced by landscaping along a segment of Wilshire Boulevard, further impacts resulting from the potential removal of this landscaping and the associated visual impacts are possible (see Section 3.7, Visual Quality).

As described above, the plans and policies of these jurisdictions outline specific goals, objectives, or policies to direct and/or enhance the transit-oriented use of the corridor:

- The plans identify the need to focus and concentrate new development in existing commercial areas.

- The plans promote mixed-use projects in commercial areas.
- The plans support transit-oriented development, in particular focusing on development that is pedestrian-oriented.
- The plans promote the development of a public transit system that improves mobility with convenient alternatives to automobile travel.
- The plans promote development of alternatives to the automobile, such as transportation demand strategies.

As a Bus Rapid Transit project, this alternative provides the opportunity to support both transit and land use in a dense, urban, highly traveled corridor. The Cities of Los Angeles, Beverly Hills, and Santa Monica, in general, all plan for high-density mixed-uses within station areas to allow for maximum use of the transit system. Therefore, implementation of the Wilshire BRT Alternative would result in less than significant impacts on neighborhood character and quality of life for adjacent neighborhoods.

In the case of the Wilshire BRT, elimination of two-lanes of traffic on this major Boulevard, which abuts several neighborhoods, would likely result in the redirection of traffic onto adjacent streets. The resultant increase in traffic flow on neighborhood streets would also result in increased traffic–induced noise and air pollution. For detailed description of traffic, noise, and air quality impacts on sensitive receptors within affected neighborhoods resulting from the project alternatives, refer to Sections 3.2 (Traffic and Circulation), 3.3 (Parking), 3.8 (Air Quality), and 3.9 (Noise and Vibration) of this document.

Construction Impacts. Construction of Alternative 1 and associated facilities may cause temporary interference with access to land uses along the Wilshire Boulevard Corridor. However, given the short-term and temporary nature of these disturbances (no more than 6 months), impacts would be less than significant. For detailed description of traffic, noise, and air quality construction impacts resulting from the project alternatives, refer to Sections 3.2 (Traffic and Circulation), 3.3 (Parking), 3.8 (Air Quality), and 3.9 (Noise and Vibration) of this document.

Alternative 1A: Wilshire BRT (Median Adjacent Design Option)

With this design option, all components of the Wilshire BRT would be the same, except the BRT would operate exclusively in the existing lanes adjacent to the medians. Land use impacts resulting from this design option would be identical to Alternative 1. Therefore, implementation of Alternative 1A would have less than significant land use impacts.

Alternative 1B: Wilshire BRT (Curb Adjacent Design Option)

With this design option, all components of the Wilshire BRT would be the same, except the BRT would operate exclusively in the existing lanes adjacent to the curb. Land use impacts resulting from this design option would be identical to Alternative 1. Therefore, implementation of Alternative 1A would have less than significant land use impacts.

Alternative 2: Wilshire BRT and Exposition BRT (Full Length)

Alternative 2 would consist of the Wilshire BRT and the full length of the Exposition BRT described in Section 2.0 (Alternatives Considered). Given that Wilshire BRT impacts have been disclosed above, the following discussion focuses on any potential land use impacts that may occur along the Exposition Corridor. There are 20 stations proposed for the Exposition BRT (see Table 3.5-1, and Figures 3.5-1 and 3.5-2).

Land Use Compatibility

Compatibility of Transit Operations and Stations. Sensitive receptors, such as residences and schools (described in Table 3.5-1 and Figure 3.5-1) adjacent to the Exposition Corridor and the proposed Exposition BRT stations, would experience increased noise, air pollution, and traffic as a result of transit operations. However, in most cases, these uses are not located immediately adjacent to the Boulevard, but rather in the neighborhoods to the north and south of the Exposition Corridor. Segments of the Exposition Corridor that contain sensitive uses (i.e., residences) immediately adjacent to the ROW are located between Vermont Avenue and La Brea Avenue (see Table 3.5-1 and Figure 3.5-1). The Exposition Corridor consists of a high concentration of residential neighborhoods and schools, particularly east of Sepulveda Boulevard, with most of these uses being east of Robertson Boulevard. Similar to the Wilshire BRT, the Exposition BRT stations proposed at Vermont Avenue, Crenshaw Boulevard, and La Brea Avenue have been placed away from sensitive land uses in areas with predominantly industrial or commercial uses to help minimize disruptions to these land uses. In addition, as illustrated by Figure 3.5-3, many of the stations have been proposed near redevelopment areas in an effort to provide increased access to these areas. In addition, consistent with applicable plans and policies, the development of a transit system along the Exposition Corridor, is a compatible and desired land use. Therefore, transit operations, such as the buses themselves, and stations for Alternative 2 are not expected to be incompatible with surrounding land uses. Transit operation and station compatibility impacts would be less than significant in commercial areas and significant in residential neighborhoods. Impacts resulting from transit operations and stations leading to potential land use incompatibilities and diminished quality of life in residential neighborhoods can be reduced to less than significant levels by implementation of Mitigation Measure 3.5-1:

- *Mitigation Measure 3.5-1:* In residential areas, station area plans shall be developed in coordination with local jurisdictions, adjacent residents, and businesses.

Nuisance impacts on sensitive receptors resulting from bus operations and stations are discussed in other applicable sections of the EIS/EIR (i.e., Sections 3.2-Traffic and Circulation, 3.3-Parking, 3.7-Visual Quality, 3.8-Air Quality, and 3.9-Noise and Vibration).

Compatibility of Park-and-Ride Facilities. The locations of proposed park-and-ride facilities along the Exposition Corridor are described in Table 3.5-1. Similar to the siting of stations, park-and-ride lots are proposed at locations away from sensitive land uses in areas with predominantly industrial or commercial uses to help minimize disruptions to these land uses. In the majority of cases, park-and-ride lots are located at, or immediately adjacent to, the stations. As such, impacts of these facilities would be similar to impacts of transit stations described above, with potentially significant impacts for replacement-parking sites located adjacent to residential uses along the Wilshire BRT route. Impacts for the Exposition Route would not be significant. Implementation of Mitigation Measure

3.5-1 (as described above under Compatibility of Transit Operations and Stations) and Mitigation Measure 3.5-2 would reduce impacts associated with Park-and-Ride Facilities along the Wilshire BRT route to a less than significant level.

- *Mitigation Measure 3.5-2:* Off street parking adjacent to residences shall be screened and laidout to minimize nuisances and disruption.

Neighborhood Impacts

Accessibility to Key Community Facilities (Activity Centers)/Community Cohesion. Similar to the Wilshire Boulevard Corridor, the Exposition Corridor conveniently links a number of activity centers and much of the corridor is bounded by transit supportive uses as described in Table 3.5-1. Table 3.5-3 indicates that the Exposition Corridor is lined with more than 2,800 acres of transit supportive land uses, or about 30 percent of the total land area in this corridor. There is a higher proportion of transit-supportive land uses in the Wilshire BRT and Exposition BRT corridors than in the overall Mid-City/Westside Corridor study area, which contains about 26 percent of transit supportive uses.

TABLE 3.5-3
PERCENTAGE OF TRANSIT SUPPORTIVE LAND USE WITHIN 0.5 MILE OF EXPOSITION

Land Use	Total Acres of Transit Supportive Land Uses	Acreage of Other Land Uses	% of Total Transit Supportive Land Uses
Commercial	650	874	43%
Institutional	605	--	100%
Higher Density Residential	1,325	531	71%
Regional Recreational	260	--	100%
Other Non-Supporting Uses	--	5,247	0%
TOTAL	**2,840**	**9,492**	**30%**

Source: SCAG 1994 and EIP Associates 1999

Given that the Exposition BRT Alternative proposes buses to traverse the Corridor, partially in the mixed flow of traffic (at its easternmost and westernmost segments), it is not expected to disrupt a cohesive social unit, or divide any established neighborhoods (i.e., those described in Table 3.5-1), because the transit service would utilize an existing railroad ROW and historically heavily-traveled roadways between downtown Los Angeles and Santa Monica. Therefore, community cohesion impacts are expected to be less than significant.

Development of a transit system along the Exposition Corridor would help the land uses along this heavily used east-west route (between downtown Los Angeles and Santa Monica) become better linked. Uses considered to be supportive of transit include higher density residential areas, intensive commercial and industrial developments that represent significant job centers, colleges and universities, institutional facilities (such as medical centers and civic centers), and regional recreational facilities. As shown by Table 3.5-1, the types of uses along the Exposition Corridor are characteristically transit supportive. As such, it is desirable to serve these destinations with transit to enhance their accessibility from within and outside the Westside Corridor study area. Additionally, because of their intensity of development and/or level of activity (in terms of people coming and going), they are natural sources for transit riders. Therefore, development of the Wilshire BRT

Alternative would be beneficial because it would provide new and increased accessibility to key Westside community facilities and activity centers.

Neighborhood Character and Quality of Life. As previously discussed in Table 3.5-1 and Compatibility with Transit Operations and Stations (above), portions of the Exposition Corridor are located adjacent to single-family residential neighborhoods, with a high number of schools. However, as previously discussed, the plans and policies of the affected jurisdictions outline specific goals, objectives, or policies to direct and/or enhance the transit-oriented use of the corridor:

- The plans identify the need to focus and concentrate new development in existing commercial areas.
- The plans promote mixed-use projects in commercial areas.
- The plans support transit-oriented development, in particular focusing on development that is pedestrian-oriented.
- The plans promote the development of a public transit system that improves mobility with convenient alternatives to automobile travel.
- The plans promote development of alternatives to the automobile, such as transportation demand strategies.

As a Bus Rapid Transit project, this alternative provides the opportunity to support both transit and land use in a dense, urban, highly traveled corridor. The Cities of Los Angeles, Culver City, and Santa Monica, in general, all plan for high-density mixed-uses within station areas to allow for maximum use of the transit system. Neighborhood Character/Quality of Life impacts would be less than significant along the Wilshire BRT route and potentially significant on Exposition. Implementation of Alternative 2 and impacts resulting from transit operations and stations leading to potential land use incompatibilities and diminished quality of life in residential neighborhoods along the Exposition ROW can be reduced to less than significant levels by implementation of Mitigation Measure 3.5-1 (as described above under Compatibility of Transit Operations and Stations).

In some neighborhoods along the Exposition Corridor, residences are located within 30 feet of the Corridor. For detailed description of traffic, noise, visual, air quality, and safety impacts on these neighborhoods resulting from the Proposed Project, see Sections 3.2 (Traffic and Circulation), 3.3 (Parking), 3.7 (Visual Quality), 3.8 (Air Quality), 3.9 (Noise and Vibration), and 3.14 (Safety and Security).

Construction Impacts. Construction impacts for the Wilshire BRT portion of Alternative 2 would be the same as those described for Alternative 1. Implementation of BRT within the Exposition Corridor also would result in similar impacts to the Wilshire BRT. Given the short-term and temporary nature of construction (no more than 6 months), impacts would be less than significant. For detailed description of traffic, noise, and air quality construction impacts resulting from the project alternatives, refer to Sections 3.2 (Traffic and Circulation), 3.3 (Parking), 3.8 (Air Quality), and 3.9 (Noise and Vibration) of this document.

Alternative 2A: Wilshire BRT and Exposition BRT (MOS)

The Exposition BRT MOS component of Alternative 2 would terminate at the Venice/Washington Station. Given that the Wilshire BRT impacts have been disclosed above, and that the MOS option of the Exposition BRT is only a shorter route of the full-length alternative, the land use impacts of Alternative 2A would be similar to Alternative 2. Any impacts to land uses and neighborhoods west of the Venice/Washington Station would not occur, and no increased land use impacts would occur at the westernmost MOS station location. Impacts would be less than significant.

Alternative 3: Wilshire BRT and Exposition LRT (Full Length)

Alternative 3 would consist of the Wilshire BRT and the full length of the Exposition LRT described in Section 2.0 (Alternatives Considered). The light rail transit system along the Exposition corridor would consist of 16 stations (see Table 3.5-1, and Figures 3.5-1 and 3.5-2).

Land Use Compatibility

Compatibility of Transit Operations and Stations. Similar to Alternative 2, transit operation and station compatibility impacts on land use along the Exposition LRT Corridor would be less than significant in commercial areas and significant in residential areas. Impacts resulting from transit operations and stations leading to potential land use incompatibilities and diminished quality of life in residential neighborhoods can be reduced to less than significant levels by implementation of Mitigation Measure 3.5-3:

- *Mitigation Measure 3.5-3:* In residential areas, station area plans shall be developed in coordination with local jurisdictions, adjacent residents, and businesses.

Compatibility of Park-and-Ride Facilities. Park-and-ride facility compatibility impacts on land uses along the Exposition Corridor would be similar to Alternative 2. The siting of stations and park-and-ride lots are proposed at locations away from sensitive land uses in areas with predominantly industrial or commercial uses to help minimize disruptions to these land uses. In the majority of cases, park-and-ride lots are located at, or immediately adjacent to, the stations. As such, impacts of these facilities would be similar to impacts of transit stations described above, with potentially significant impacts for replacement-parking sites located adjacent to residential uses along the Wilshire BRT route. Impacts for the Exposition Route would not be significant. Implementation of Mitigation Measure 3.5-3 (as described above under Compatibility of Transit Operations and Stations) and Mitigation Measure 3.5-4 would reduce impacts associated with Park-and-Ride Facilities along the Wilshire BRT route to a less than significant level.

- *Mitigation Measure 3.5-4:* Off street parking adjacent to residences shall be screened and laidout to minimize nuisances and disruption.

Neighborhood Impacts

Accessibility to Key Community Facilities (Activity Centers)/Community Cohesion. Impacts resulting from implementation of this Alternative (Wilshire BRT and Exposition LRT) would be beneficial, similar to those described under Alternative 2 (Wilshire BRT and Exposition BRT).

Neighborhood Character and Quality of Life. Similar to the impacts of Alternative 2 described above, implementation of Alternative 3 (Wilshire BRT and Exposition LRT) would result in less than significant impacts on neighborhood character and quality of life for adjacent neighborhoods along the Wilshire ROW and potentially significant impacts on the Exposition ROW. Implementation of Mitigation Measure 3.5-3 (as described above under Compatibility of Transit Operations and Stations) can reduce impacts resulting from transit operations and stations leading to potential land use incompatibilities and diminished quality of life in residential neighborhoods along the Exposition ROW to a less than significant level.

Construction Impacts. Similar to Alternative 2, construction-related impacts of Alternative 3 would be less than significant.

Alternative 3A: Wilshire BRT and Exposition LRT (MOS)

The Exposition LRT MOS component of Alternative 3 would terminate at the Venice/Washington Station. Given that Wilshire BRT impacts have been disclosed above, and that the MOS option of the Exposition LRT is only a shorter route of the full length LRT alternative, the land use impacts of Alternative 3A would be similar to Alternative 3. It should be noted that with the Exposition LRT MOS, any impacts to land uses and neighborhoods west of the Venice/Washington Station would not occur, and no increased land use impacts would occur at he westernmost MOS station location. Impacts would be less than significant.

Maintenance Yard

Alternatives 1 through 3 (including the design options and the MOS) would require storage and maintenance facilities. A new maintenance yard(s) would provide maintenance for both the BRT/Rapid Bus systems and the LRT system and, as such, would need to be located centrally to both systems (i.e., in the downtown Los Angeles area). Section 2.0 (Alternatives Considered) provides a description of potentially feasible maintenance yards. Six potential maintenance yard sites are currently being considered by the MTA:

- NW Corner of Chavez/Mission;
- Existing MTA Division I area;
- NE Corner Alameda/Washington;
- SE Corner Alameda/Washington;
- Exposition ROW Hooper to Central; and
- Existing MTA South Park Shops.

Figure 2-17 - 2-19 in Section 2.0 (Alternatives Considered) shows the locations and physical layout of the proposed maintenance facilities. These locations are all contained within lands currently owned and operated by the MTA, and are predominantly located within industrial areas with the exception of the South Parks Shops Site, which is located in the vicinity of a residential area and school. Generally, development of any maintenance facilities within the majority of the proposed locations would be compatible with the surrounding industrial character of the area and would not result in any significant land use disruptions or incompatibilities. If a maintenance yard were to be built at the existing MTA South Park Shops, the increased volume of buses traveling through surrounding neighborhoods, and maintenance activities at the bus yard could have potentially significant impacts on sensitive receptors in the surrounding residential neighborhoods. However, land use impacts associated with the construction and operation of the remaining proposed maintenance facilities are expected to be less than significant.

Subway Design Option at USC/Exposition Park (for Alternatives 2, 2A, 3, and 3A)

The subway design option would provide a subterranean travel corridor for either the bus or light-rail transit alternatives of the Exposition Corridor in the USC/Exposition Park area. Impacts associated with a subterranean travel route are minimal due to the negligible disruption to at-grade land uses. Similar to Alternatives 2, 2A, 3, and 3A, impacts of the subway design option on land uses would be less than significant.

Mitigation Measures

Impacts resulting from transit operations and stations leading to potential land use incompatibilities and diminished quality of life in residential neighborhoods can be reduced to less than significant levels by:

- In residential areas, station area plans shall be developed in coordination with local jurisdictions, adjacent residents, and businesses.

3.5.4 Cumulative Impacts

The 1998 RTP Draft Master EIR (SCAG, 1997), which is hereby incorporated by reference, provides the cumulative context for analysis of the Mid-City/Westside Transit Corridor Project. The 1998 RTP Draft Master EIR provides a programmatic analysis of land use impacts resulting from implementation of all projects contemplated in the RTP (SCAG, 1998), including the Mid-City/Westside Transit Corridor project, and provides the basis for this cumulative impact analysis.

Projects contained within the RTP will contribute to the overall intensity of development within the SCAG region. The RTP contains growth management goals to attain mobility and to develop urban forms that enhance quality of life, that accommodate a diversity of life styles, that preserve open space and natural resources, and that are aesthetically pleasing and preserve the character of communities, enhance the regional strategic goal of maintaining the regional quality of life. Based on SCAG's review of this project during the scoping process for this EIS/EIR, the proposed project is consistent with the SCAG RTP. Therefore, given that a transit system within the Mid-City/Westside Corridor Study area is a planned and desired land use, it would not be incompatible with the study area's general land use character and would serve to link activity centers within the area. As such, implementation of the planned projects of the RTP along with a transit system in the Mid-City/Westside Corridor Study area is not expected to result in cumulatively considerable land use impacts. Cumulative land use impacts would be less than significant.

3.6 Land Acquisition/Displacement and Relocation

3.6.1 Introduction

Although the Mid-City/Westside Transit Corridor alternatives under consideration are intended to maximize use of publicly-owned rights-of-way (e.g., Wilshire Boulevard and the MTA-owned Exposition railroad right-of-way [ROW]);, however there are design, alignment and mitigation features of these alternatives that may require that a business or residence be removed from the existing right of way. Specific actions that would cause displacement, include:

- Acquisition of private property for guideway alignment, station facility, parking, maintenance yard and/or impact mitigation purposes;
- Off-street replacement parking sites along Wilshire Boulevard; or
- Termination or non-renewal of existing LACMTA leases within the railroad ROW.

3.6.2 Affected Environment

For purposes of the discussion of potential land acquisition impacts, the affected environment is limited to the areas included within and directly adjacent to the proposed Wilshire BRT and Exposition BRT/LRT routes, as defined below:

Wilshire

The Wilshire Boulevard route is a heavily urbanized and dense environment. Growth that will take place along the route over the next 20-year period will be in-fill development on vacant or underutilized sites, as well as replacement of structures that have exhausted their useful economic life. Wilshire Boulevard component of the area is generally characterized by commercial uses fronting Wilshire Boulevard in 100-150 foot depth parcels. Beyond these commercial parcels in many cases are an east-west service alley, surface or structured parking and then residential uses. Both multi-family units and single-family homes are located adjacent to commercial uses or the service alley along much of the Wilshire route. The one exception is the high-density residential area west of Santa Monica Boulevard and east of Westwood.

Exposition

Because of the former use of the Exposition ROW for rail service, industrial uses are found adjacent to the right-of-way in a number of locations. Specifically, industrial/commercial development that is located directly adjacent to the former right-of-way is concentrated in the following segments along the route:

- Long Beach Avenue to Hill Street
- 9th Avenue to Crenshaw Boulevard
- Farmdale to Venice

- San Diego Freeway (I-405) to 17th Street

In 1991, the MTA acquired the railroad rights-of-way throughout the Los Angeles area from Southern Pacific Transportation Company. As part of this process, MTA inherited lease agreements entered into by the railroad. Since its ownership MTA has entered into land leases and has granted certain temporary and permanent easements. A number of commercial and industrial businesses along the Exposition ROW entered into lease agreements to expand their sites for parking, storage, and/or building improvements. Most MTA leases of the Exposition ROW are on a month-to-month basis, however, there are several in the western portion of the Exposition railroad ROW that have long term renewal options extending to the year 2019 (the leases expire in 2004, and have three five-year options extending to 2019).

As shown in Table 3.6-1, almost 90 percent of MTA's leases within the Exposition ROW are on a month-to-month basis. About 30 percent of leases involve business purposes such as patron and employee parking, access, storage and lay-down areas, temporary buildings and site beautification. In addition to leases, the LACMTA under the provisions of its ROW Protection Guidelines has also granted licenses for largely beautification and landscaping improvements.

TABLE 3.6-1
EXPOSITION ROW LEASE SUMMARY

Segment	Total	Type of ROW Use				Lease Terms	
		Utilities	Business Purposes*	Signs and Billboards	Misc. Easements	Month-to-Month	Longer Term or Special Circumstances
Rail Link to LRT Maintenance Yard	27	8	12	7	0	25	2
South LA	51	15	6	22	8	50	1
Culver City	37	14	12	2	9	32	5
West LA	42	16	16	5	5	37	5
Santa Monica	40	17	13	4	6	32	8
TOTAL	**197**	**70**	**59**	**40**	**28**	**176**	**21**
PERCENT	**100.0%**	**35.5%**	**29.9%**	**20.3%**	**14.2%**	**89.3%**	**10.7%**

* Includes, parking, storage, lay-down, buildings, and beautification

Source: LACMTA Real Estate Department and Terry A. Hayes Associates 2000.

3.6.3 Impact Assessment and Mitigation Measures

Standards of Significance

For purposes of this environmental evaluation, a significant land acquisition and displacement impact may occur when:

- Real property is acquired and business or residential owners or tenants are required to relocate;

- Long-term leases are terminated prior to their normal expiration date for the purpose of constructing a transit service improvement and supporting infrastructure. (The expiration of month-to-month leases or leases where relocation waivers have been executed would not be considered significant);

- A business operation is disrupted due the loss of needed parking, access or storage areas.

Methodology for Impact Evaluation

To assess the potential for the acquisition of private property, plan and profile drawings identifying the detailed location of the guideway alignment, stations and maintenance yards were reviewed to identify non-publicly owned areas that would be needed for the proposed project or project alternatives. To address off-street replacement parking impacts, areas along Wilshire Boulevard where parking would be displaced were reviewed to determine whether there were candidate replacement sites that satisfied the Replacement Parking Strategy described in Section 3.2 (Traffic). To estimate the effect of non-renewal of LACMTA leases within the Exposition railroad ROW, the lease database available from the LACMTA Real Estate Division was reviewed.

Impacts

No Action Alternative (Baseline)

As discussed in Section 2, the No Action Alternative involves primarily increases to the bus operations fleet and minor transit service restructuring. It would not involve the acquisition of real property. No impacts would occur.

Transportation System Management (TSM) Alternative

As described in Section 2 of this report, the TSM Alternative would involve largely operational and route restructuring improvements along with extensions of the MTA Rapid Bus service and corridors. No land acquisition or displacement is involved from these activities, and no impacts would occur.

Alternative 1: Wilshire BRT (Baseline Median-Running)

The Wilshire BRT Alternative would provide exclusive travel lanes within the median of Wilshire Boulevard. As such, the alternative would not directly require the acquisition of property. Station locations would either be in the street median or on the adjacent public sidewalk and also would not require the acquisition of private property.

The primary property acquisition required for the Wilshire BRT Alternatives would result from the use of sites for the replacement of curb parking spaces that would be lost along the route. According to a parking survey conducted along Wilshire Boulevard, approximately 1,335 curb parking spaces would need to be replaced. At approximately 400 square feet per space, replacement parking would require approximately 12 acres of land.

To address the loss of parking for business districts along Wilshire Boulevard, the MTA, as part of the project, would adopt a Replacement Parking Strategy as described in Section 3.2 (Traffic). This strategy would seek to replace parking in locations convenient and accessible to existing businesses and employers. The strategy would use the acquisition of private property as a last resort and focus first on the following types of replacement parking options: (1) use of MTA-owned parking sites, (2) other public agency owned sites, (3) agreements with existing surface parking lot operators to reconfigure or deck existing parking areas, (4) fair share contributions to other parking structures being planned or (5) entering into agreements with commercial properties that have underutilized surface or structured parking.

As shown in Table 3.6-2, the need to replace lost curb parking is not equally distributed along the Wilshire route. The largest and most concentrated area of curb parking loss is in the Santa Monica segment. In this 2.6-mile section, approximately 4.6 acres of replacement parking space would be needed. The land requirements for surface parking in other segments of the Wilshire route is approximately 2 acres.

TABLE 3.6-2
OFF STREET REPLACEMENT PARKING*

Segment	Affected Area	Parking Spaces to be Replaced and surface parking land requirement	Land Area Needed for Replacement as Surface Parking (Worst Case)	Potential Worst Case Theoretical Displacement Based on Existing Land Use Patterns
Los Angeles - Mid-City	Western to Bronson, and Citrus to San Vicente	261	2.4 acres	80,000 S.F. commercial and 20 dwelling units
Beverly Hills	San Vicente to Hamilton, and La Cienega to Maple	269	2.5 acres	80,000 S.F. commercial and 10 dwelling units
West Los Angeles	Comstock to Malcolm and Barry to Centinela	259	2.4 acres	50,000 S.F. commercial and 10 dwelling units
Santa Monica	Centinela to Second	546	5.0 acres	50,000 S.F. commercial and 50 dwelling units

*Assumes one for one replacement of lost spaces.

Source: Korve Engineering and Terry A. Hayes Associates 2000.

Outlined below is a segment-by-segment characterization of the issues affecting the acquisition of property. MTA's goal will be to acquire property through negotiations on a willing seller basis. However, if acquisition through negotiations is not successful, MTA could use its right to acquire property through eminent domain proceedings.

- *Western to Bronson.* MTA owns no sites. There are several surface parking lots that may be candidates for modification or decking. The need to acquire improved property is moderate.

- *Bronson to Citrus.* There are no displaced parking spaces along this segment. MTA owns one lot in this segment on the south side of Wilshire between Crenshaw and Lorraine. However, since there are no displaced spaces in this segment, this lot is beyond the reasonable distance for a replacement lot for those segments where parking is lost. There are several surface parking lots that may be candidates for modification or decking. The need to acquire improved property is moderate.

- *Citrus to San Vicente.* MTA owns one site at La Brea. Surface parking lots and rear surface parking suggest opportunities to minimize acquisition of new parking sites through either reconfiguration or construction of small parking structures. Acquisition potential of improved property is low to moderate.

- *San Vicente to Hamilton.* MTA owns no sites. There are no vacant sites. Acquisition potential of improved property is high.

- *La Cienega to Maple.* MTA owns no sites. Two to three vacant sites may provide opportunities for relocated parking. Less intensive use of office buildings may also offer opportunities to share parking space. Acquisition potential of improved property is moderate to highly likely.

- *Comstock to Malcom.* MTA owns no sites. There are no vacant sites. There are no surface parking lots. Acquisition would likely affect low scale older residential properties fronting Wilshire Boulevard. The probability of acquisition is high; however, acquiring residential property for this purpose may not be feasible given the resulting displacement of residential occupants.

- *Barry to Centinela.* MTA owns no sites. There are no vacant sites and no surface parking lots. The only opportunity for replacement involves the use of underutilized existing structured parking in office buildings (if any). The probability of acquisition is high.

- *Centinela to Second.* MTA owns no sites. There are no Wilshire frontage vacant sites. There are scattered small surface parking lots, 2-3 may be of sufficient size for redevelopment as parking structures. Acquisition would likely focus on the small-scale one-story commercial buildings at corners to avoid driveways on Wilshire Boulevard. The acquisition potential is high, however, the probabilities of acquiring these desirable locations on a willing seller basis are low.

The analysis of the different segments along Wilshire Boulevard indicates that it may not be feasible to provide a parking lot/structure in every block, so the replacement parking that is provided is likely to be less convenient for customers of some businesses. Even if the 1,335 parking spaces are fully replaced, they will be in consolidated facilities, which will be less convenient than on-street parking directly in front of the business or residence.

In summary, the Wilshire BRT Alternative will have a significant unavoidable impact on access and convenience to fronting properties along Wilshire Boulevard due to the loss of on-street parking. This impact will be partially reduced by the development of off-street replacement parking as part of the BRT project, but it is not likely to be fully mitigated.

Alternative 1A: Wilshire BRT (Median Adjacent Design Option)

This option would also require the implementation of a replacement parking program that would likely result in acquisition of private property similar to the baseline Alternative 1.

Alternative 1B: Wilshire BRT (Curb Adjacent Design Option)

This option would also require the implementation of a replacement parking program that would likely result in acquisition of private property similar to the baseline Alternative 1.

Alternative 2: Wilshire BRT and Exposition BRT (Full Length)

Acquisition and displacement impacts for the Wilshire BRT component of this alternative would be the same as the Wilshire BRT alternative discussed above. The incremental land acquisition and displacement affects associated with the Exposition BRT portion of this alternative are discussed below.

ROW Leases. The primary impact of this component of the alternative would be the non-renewal and/or termination of leases held by the MTA. Approximately 170 leases would be affected (see Table 3.6-3). One hundred and fifty-one (151) are month-to-month leases and 19 are longer term. Business-related impacts, which could result in displacement, involve 57 leases for parking, storage areas and access. Of the 62 utility leases, it is expected that the majority will require the relocation or reconfiguration of the utility. The remaining 28 leases that represent miscellaneous easements would be terminated.

TABLE 3.6-3
EXPOSITION BRT LEASE SUMMARY

		Type of ROW Use				Lease Terms	
Segment	**Total**	**Utilities**	**Business Purposes***	**Signs and Billboards**	**Misc. Easements**	**Month-to-Month**	**Longer Term or Special Circumstances**
Rail Link to LRT Maintenance Yard	na	na	na	na	na	na	na
South LA	51	15	6	22	8	50	1
Culver City	37	14	12	2	9	32	5
West LA	42	16	16	5	5	37	5
Santa Monica	40	17	13	4	6	32	8
TOTAL	**170**	**62**	**47**	**33**	**28**	**151**	**19**

* Includes, parking, storage, lay-down, buildings, and beautification

Source: LACMTA Real Estate Department and Terry A. Hayes Associates 2000.

ROW Licenses. As noted above, the LACMTA has granted licenses in scattered areas along the Exposition ROW to allow landscaping and beautification under the provisions of the LACMTA ROW protection guidelines. It is expected that these licenses would be terminated under the terms of the license. The termination of these right-of-way licenses is expected to result in a less than significant impact.

Acquisition of Property. The Exposition BRT alignment would result in the acquisition of property outside of the existing ROW in two areas. First, the creation of a park and ride facility for 1,140 parking spaces between 26th Street and Stewart Street in Santa Monica would displace the Bergamot Station Art Center. Bergamot Station is home to the Santa Monica Museum of Art owned by the City of Santa Monica. This displacement would affect approximately 60 galleries and arts-related businesses and activities, as well as the Santa Monica Museum of Art. Bergamot Station should be evaluated for potential shared use of the site with the transit facility. Evaluation should be conducted as a part of the preliminary design phase of the project. If joint use plans can be developed, impacts resulting from displacement of Bergamot Station can be reduced to a less than significant level.

In addition, the BRT maintenance yard options would also require land displacements similar to those described for the Wilshire BRT Alternative.

Alternative 2A: Wilshire BRT and Exposition BRT (MOS)

Acquisition and displacement impacts for the Wilshire BRT component of this alternative would be the same as the Wilshire BRT alternative discussed above. The incremental land acquisition and displacement affects associated with the Exposition BRT MOS portion of this alternative are discussed below.

ROW Leases. The primary impact of this component of the alternative would be the non-renewal and/or termination of leases held by the MTA. Approximately 88 leases would be affected (See Table 3.6-4). Eighty-two (82) are month-to-month leases and 6 are longer term. Business-related impacts, which could result in displacement, involve 59 leases for parking, storage areas and access. Of the 29 affected utility leases, it is expected that the majority will require the relocation or reconfiguration of the utility. The remaining 17 leases for beautification, as well as 24 leases for billboards and signs, would be terminated.

TABLE 3.6-4
EXPOSITION BRT MOS LEASE SUMMARY

Segment	Total	Type of ROW Use				Lease Terms	
		Utilities	Business Purposes*	Signs and Billboards	Misc. Easements	Month-to-Month	Longer Term or Special Circumstances
Rail Link to LRT Maintenance Yard	na	na	Na	na	na	na	na
South LA	51	15	6	22	8	50	1
Culver City	37	14	12	2	9	32	5
West LA	na	na	Na	na	na	na	na
Santa Monica	na	na	Na	na	na	na	na
TOTAL	**88**	**29**	**18**	**24**	**17**	**82**	**6**

* Includes, parking, storage, lay-down, buildings, and beautification

Source: LACMTA Real Estate Department and Terry A. Hayes Associates 2000.

ROW Licenses. MTA has granted licenses in within the Exposition ROW to allow landscaping and beautification under the provisions of the MTA ROW protection guidelines. It is expected that these licenses would be terminated under the terms of the license; however, the termination of those right-of-way licenses is expected to result in a less than significant impact.

Acquisition of Property. The Exposition BRT MOS would not require land acquisition with the exception of a proposed BRT maintenance yard site near downtown Los Angeles. The yard displacement affects would be similar to those described for the Wilshire BRT Alternative.

<u>Alternative 3: Wilshire BRT and Exposition LRT (Full Length)</u>

Acquisition and displacement impacts for the Wilshire BRT component of this alternative would be the same as the Wilshire BRT alternative discussed above. The incremental land acquisition and displacement affects associated with the Exposition LRT portion of this alternative are as follows.

ROW Leases. The primary impact of this component of the alternative would be the non-renewal and/or termination of leases held by the MTA. Approximately 197 leases would be affected (See Table 3.6-5). The number of leases affected is greater than the Exposition BRT component because of the use of MTA railroad ROW to reach the proposed maintenance yard east of Hill Street.

TABLE 3.6-5 EXPOSITION LRT ROW LEASE SUMMARY							
	Total	**Type of ROW Use**				**Lease Terms**	
Segment		**Utilities**	**Business Purposes***	**Signs and Billboards**	**Misc. Easements**	**Month-to-Month**	**Longer Term or Special Circumstances**
Rail Link to LRT Maintenance Yard	27	8	12	7	0	25	2
South LA	51	15	6	22	8	50	1
Culver City	37	14	12	2	9	32	5
West LA	42	16	16	5	5	37	5
Santa Monica	40	17	13	4	6	32	8
TOTAL	**197**	**70**	**59**	**40**	**28**	**176**	**21**
* Includes, parking, storage, lay-down, buildings, and beautification							
Source: LACMTA Real Estate Department and Terry A. Hayes Associates 2000.							

Specifically, 176 are month-to-month leases and 21 are longer term. Business-related impacts, which could result in displacement, involve 18 leases for parking, storage areas and access. Of the 70 affected utility leases, it is expected that the majority will require the relocation or reconfiguration of the utility. The remaining 28 leases for beautification, as well as 40 leases for billboards and signs, would be eliminated. This would result in a potentially significant impact.

ROW Licenses. Impacts on licenses for beautification would be similar to the Exposition BRT Alternative. No significant impacts are anticipated.

Acquisition of Private Property. The Exposition LRT alignment would result in the acquisition of property outside of the existing ROW in two areas. First, the turn of the route at Sepulveda and Venice would displace a convenience store on the northeast corner of this intersection. Second, the creation of a park and ride facility for 1,140 parking spaces between 26th Street and Stewart Street in Santa Monica would displace the Bergamot Station Art Center. Bergamot Station is home to the Santa Monica Museum of Art owned by the City of Santa Monica. This displacement would affect approximately 60 galleries and arts-related businesses and activities, as well as the Santa Monica Museum of Art leading to a potentially significant impact. Bergamot Station should be evaluated for potential shared use of the site with the transit facility. Evaluation should be conducted as a part of the preliminary design phase of the project. If joint use plans can be developed, impacts resulting from displacement of Bergamot Station can be reduced to a less than significant level.

Because the proposed LRT maintenance yard (see Figure 3.6-2) is to be located within the existing Exposition ROW, no additional land acquisition is anticipated. Impacts to leases in this area are discussed above.

Alternative 3A: Wilshire BRT and Exposition LRT (MOS)

Acquisition and displacement impacts for the Wilshire BRT component of this alternative would be the same as the Wilshire BRT alternative discussed above. The incremental land acquisition and displacement affects associated with the Exposition LRT MOS portion of this alternative are discussed below:

ROW Leases. The primary impact of this component of the alternative would be the non-renewal and/or termination of leases held by the MTA. Approximately 115 leases would be affected (Table

3.6-6). One hundred and seven (107) are month-to-month leases and 8 are longer term. Business related impacts, which could result in displacement, involve 30 leases for parking, storage areas and access leading to a potentially significant impact.

TABLE 3.6-6
EXPOSITION LRT MOS LEASE SUMMARY

Segment	Total	Type of ROW Use				Lease Terms	
		Utilities	Business Purposes*	Signs and Billboards	Misc. Easements	Month-to-Month	Longer Term or Special Circumstances
Rail Link to LRT Maintenance Yard	27	8	12	7	0	25	2
South LA	51	15	6	22	8	50	1
Culver City	37	14	12	2	9	32	5
West LA	na	na	na	na	na	na	na
Santa Monica	na	na	na	na	na	na	na
TOTAL	**115**	**37**	**30**	**31**	**17**	**107**	**8**

* Includes, parking, storage, lay-down, buildings, and beautification

Source: LACMTA Real Estate Department and Terry A. Hayes Associates 2000.

ROW Licenses. Impacts on Licenses for beautification would be similar to the Exposition BRT Alternative. Less than significant impacts are anticipated.

Acquisition of Property. The Exposition LRT MOS would not require land acquisition.

Mitigation Measures

The potential effects of property acquisition and the displacement of persons and business will be substantially alleviated through compliance with applicable federal and state laws governing relocation assistance and property acquisition procedures. The *Uniform Relocation Assistance and Real Property Acquisition Polices Act of* 1970, as amended (Uniform Act), mandates that certain relocation services and payments be made available to eligible residents, businesses, and nonprofit organizations displaced as a direct result of programs or projects undertaken by a federal agency or with federal financial assistance. The Uniform Act provides for uniform and equitable treatment of persons displaced from their homes or business and establishes uniform and equitable land acquisition policies. The provisions of the *California Relocation* Act (California Act), applies in the absence of federal funds and/or involvement if a public entity undertakes a project and consequently must provide relocation assistance and benefits. The California Act, which is consistent with the intent and guidelines of the Uniform Act seeks to (1) ensure the consistent and fair treatment of owners of real property (2) encourage and expedite acquisition by agreement to avoid litigation and relive congestion in the courts and (3) promote confidence in the public land acquisitions.

The entities displaced by any of the proposed alternatives may be entitled to relocation assistance under the Uniform Act or California Act due to the termination of their lease agreements with MTA. However, the qualification for assistance is dependent upon the specific lease agreement. In many instances, the lease agreement with the MTA contains a provision wherein the tenant acknowledged that they are not entitled to relocation benefits if the lease is terminated for a public transit project.

Licenses for beautification of the Exposition ROW will be revoked under terms of the license granted by the MTA. As appropriate, replacement landscaping would be provided consistent with the transit project design and engineering requirements.

Bergamot Station. During Preliminary Engineering and preparation of the Final EIS/EIR, alternative designs shall be developed for a joint use of the Bergamot Station property. In addition to the transit center and attendant parking, facilities for the Santa Monica Museum of Art and related art facilities shall be included in this design process and appropriate shared uses of the site shall be included in the Final EIS/EIR as mitigation measures for the project.

Maintenance Yard

MTA Operations has indicated that none of the existing bus divisions in the Central City or Westside areas have the capacity for the expanded maintenance and storage required by the articulated buses needed for the Wilshire BRT Alternative. To address this need, MTA is considering candidate sites for a maintenance yard in the downtown areas of Los Angeles. The sites under consideration are as follows (see Figures 2-17 through 2-19):

- MTA-owned Division 1 (Alameda/6th) – a 6.7-acre site with existing MTA facilities. There is also a three-acre adjacent site that is under consideration for the BRT yard.
- South Park Shops (54th/Avalon) – a 9-acre site with existing MTA facilities.
- NE Washington/Alameda – a 10.3-acre site containing a truck warehouse, a medical office building, and a gas station.
- SE Washington/Alameda – a 10.3-acre site containing a vacated private bus yard, truck sales, and metal fabrication shop.
- Chavez/Mission Road – a 7-acre site containing a salvage yard, soil storage, and two auto-related businesses.

Two of the sites under consideration are existing MTA facilities (i.e., the Division 1 site near 6th Street and Alameda and the South Park shops near 54th Street and Avalon). The use of these sites would not displace private property, but would require that either regular bus maintenance services be consolidated at another MTA site or relocated to a new facility. Impacts would be less than significant.

Subway Design Option at USC/Exposition Park (for Alternatives 2, 2A, 3, and 3A)

This option would not require the permanent acquisition of private property nor would it require the removal any property on the campus of the University of Southern California or Exposition Park. No impacts would occur. A short-term lease or temporary construction easements, may be needed, for spoil or stock piling during the period of excavation.

3.6.4 Cumulative Impacts

Wilshire BRT. As discussed in Section 3.4.3, with the exception of the implementation of the Replacement Parking Strategy, there would be no direct land acquisition associated with the Wilshire

BRT. Even the replacement parking strategy is focused on a series of options that place the acquisition of real property as the last resort alternative. An adverse cumulative land acquisition effect would only occur where this last resort option is exercised by the MTA and where another public agency may exercise its authority to acquire or assemble property of public purposes, such as a redevelopment agency, school district or public works department in the same general geographic vicinity. Along the Wilshire route, redevelopment projects are only in place in the City of Los Angeles. There are no redevelopment agencies or redevelopment projects in the City of Santa Monica or Beverly Hills. The Community Redevelopment Agency of the City of Los Angeles' Koreatown Wilshire Center project area is the only area to affect Wilshire Boulevard. However, there are no known or anticipated major redevelopment actions where business and residential displacement is expected. Thus, adverse cumulative impacts are not expected. In addition, the most recent plans of the Los Angeles Unified School District also do not indicate plans to acquire real property along Wilshire Boulevard west of Western Avenue. Impacts are expected to be less than significant.

Exposition BRT or LRT. The development of transit improvements along this alignment will entail the termination or non-renewal of current leases along the ROW. These changes may have a direct adverse affect on some businesses that are entirely located within the ROW or those that rely substantially on land in the ROW for their operations. The Exposition route passes through redevelopment areas in Los Angeles (Council District 9, Hoover, Mid-City, and Crenshaw). It also passes through the Culver City Redevelopment area. In these areas, the potential exists for a combined displacement effect should the redevelopment agencies find opportunities to achieve their revitalization objectives. At this time, there are no known redevelopment intervention actions that are expected to result in displacement of businesses or residences that would create a combined adverse effect with the elimination of business leases within the Exposition ROW. It should be noted that the proposed redevelopment of the Santa Barbara Plaza area (south of the Exposition route near Crenshaw) would displace local businesses. However, in this same vicinity, there are few if any business leases to be terminated within the Exposition ROW and thus, no cumulative adverse effects are anticipated. In other westerly portions of the Exposition ROW (Culver City, West Los Angeles, and Santa Monica) where leases would also terminate, no other collateral actions by public agencies to acquire land are expected or anticipated that would intensify business dislocation and increase competition for relocation space and resources. Impacts would be less than significant.

3.7 Visual Quality

3.7.1 Introduction

The purpose of this section is to evaluate and describe the impacts of the proposed Mid-City/Westside Transit Corridor Project. The focus of this analysis is to describe the existing visual character of the two corridors (Wilshire Boulevard and the Exposition right-of-way), describe the potential changes in visual character that would result from implementation of the alternatives, and determine whether those changes would result in significant adverse impacts to the visual environment.

3.7.2 Affected Environment

This section describes existing aesthetic and visual resources of the project area. In particular, descriptions of existing visual characteristics, both onsite and in the vicinity of the project site, are presented. This information relies upon, and summarizes, information presented in the Land Use and Urban Design study for the Mid-City/Westside Transit Corridor Project, which is incorporated by reference herein for the purposes of NEPA and CEQA. The Land Use and Urban Design Study was prepared at the same time as the Mid-City/Westside MIS to help facilitate design options and screening alternatives.

Wilshire Corridor

Wilshire Boulevard stretches from downtown Los Angeles to Santa Monica, and passes through or near many of the major activity centers and destinations in the metropolitan Los Angeles area. The Boulevard varies from low to high density commercial development, as well as both low and high density multi-family neighborhoods. The Corridor contains a variety of architecture styles that were in vogue at the time of construction, from the 1920's to 1990's, with structure façades that reflect these eras.

Most of Wilshire Boulevard provides six travel lanes separated either by a continuous left turn lane or by a median. Along most of the Boulevard, parking is allowed in the curb lanes during non-peak times. The portion of Wilshire Boulevard between La Brea and Fairfax Avenues (the "Miracle Mile") has a landscaped median that enhances the visual character of the Boulevard. Figures 3.7-1 through 3.7-3 provide street-level views of the Wilshire Corridor.

The corridor is generally pedestrian-friendly, with extra-wide sidewalks, street trees, planters, and landscaping, and pedestrian-serving uses at the ground-floor level of most commercial structures. Distinctive neighborhoods located adjacent to the corridor are the Hancock Park neighborhood, the Miracle Mile District, and the "Golden Triangle" of Beverly Hills.

Major destination centers located within a mile of the corridor that contribute to the demand for public transit include: the Los Angeles County Museum of Art, the Rancho La Brea Tar Pits, CBS Television Center, the Los Angeles Farmer's Market, Beverly Center, Cedars-Sinai Medical Center,

Figure 3.7-1 Street-Level Views of the Wilshire Corridor (Park Mile and Hancock Park)

Figure 3.7-2 Street-Level Views of the Wilshire Corridor (Bev. Hills & Westwood)

Figure 3.7-3 Steet-Level Views of the Wilshire Corridor (Santa Monica)

Melrose Avenue, Pacific Design Center, Rodeo Drive, Westwood Village, UCLA and UCLA Medical Center, Third Street Promenade, and Santa Monica Pier and the ocean-front parks and beaches.

Land uses immediately fronting Wilshire Boulevard generally include, from east to west: commercial and retail uses (near Western Avenue); multi-family residences and offices (between Hauser Boulevard and Highland Avenue); retail, commercial, and offices (between Highland Avenue and Santa Monica Boulevard); multi-family residential, commercial, and offices (Comstock Avenue to Sepulveda Boulevard); and retail, commercial, and offices (Federal Avenue to Ocean Avenue). The corridor is primarily characterized by mostly low- to medium-rise office and retail uses, with high-rise offices and residences at some locations, such as Beverly Hills and Westwood. The setback of development along the Boulevard varies, as does the presence of street trees and landscaped building frontages.

Land uses along the following three segments of Wilshire Boulevard have particularly distinct visual characteristics:

- The Park Mile neighborhood (from Wilton Place to Highland Avenue), with generally low-rise multi-family residences and offices that have landscaped building frontages and street trees, and well-landscaped single-family residences along the streets to the north and south;

- The portion of the Boulevard that bisects the Los Angeles Country Club (between the Beverly Hills city limits and Comstock Avenue), where both sides of the roadway are lined with shrubs and trees; and

- The portion between Veteran Avenue and Federal Avenue/San Vicente Boulevard, which includes the West Los Angeles Federal Building, the Los Angeles National Cemetery, and the Veterans Affairs grounds, with extensive landscaped setbacks that provide viewing opportunities of the surrounding areas. In addition, the portion of the Boulevard within the City of Los Angeles (east of Malcolm Avenue) has been designated a Scenic Highway, and the portion within the City of Santa Monica has been designated a Scenic Corridor.

The visual characteristics of the Wilshire Corridor, including the width of the roadway, presence of a landscaped median, predominant land uses along the corridor, the scale of buildings along the corridor, the major scenic views of the route and from the corridor, and substantive visual elements, including open space resources, are noted in Table 3.7-1, which follows the discussion of the Exposition Corridor. In addition, Figures 3.7-4 through 3.7-8 provide oblique aerial photographs of representative locations along the Wilshire Boulevard Corridor.

Exposition Corridor

The Exposition Corridor is a former rail line running along Exposition Boulevard, from Figueroa Street to the City of Santa Monica. Some portions of the right-of-way (ROW) [particularly the eastern segment] are lined with single family residential uses, while other portions are lined with industrial structures, primarily in the segment between La Brea Avenue and Venice Boulevard and between Sawtelle Boulevard and Olympic Boulevard.

Figure 3.7-4 Oblique Aerial Photograph of Wilshire Corridor (Santa Monica)

Figure 3.7-5 Oblique Aerial Photograph of Wilshire Corridor (Bev Hills)

Figure 3.7-6 Oblique Aerial Photograph of Wilshire Corridor (Bev Hills)

Figure 3.7-7 Oblique Aerial Photograph of Wilshire Corridor (Los Angeles)

Figure 3.7-8 Oblique Aerial Photograph of Wilshire (Miracle Mile)

Large portions of the ROW are vacant, due to heavy rail use over the past decades, with mature trees located along some segments, and others without any landscaping or vegetation of note. Along the eastern segment, the typical house type is a single-story bungalow treated in a variety of architectural styles. In the central and western segments of the alignment, many adjacent properties contain nondescript industrial structures. Figures 3.7-9 through 3.7-12 provide street-level views of the Exposition Corridor.

The ROW between Figueroa Street and Gramercy Place is located in the median of Exposition Boulevard, which is a six-lane street. Between Figueroa Street and Vermont Avenue, the University of Southern California and Exposition Park are located on either side of Exposition Boulevard. West of Vermont Avenue, the Corridor is predominantly residential, with sidewalks, street trees, and some trees in the right-of-way. At Gramercy Place, Exposition Boulevard splits into two segments, with the southern roadway becoming Rodeo Road. West of the split, the ROW is located on the southern side of Exposition Boulevard. In this area, residential and industrial uses are located immediately south of the ROW. At La Brea Avenue the ROW continues along the southern edge of Jefferson Boulevard. The primary land uses in this segment are industrial and commercial.

At Venice Boulevard, the route begins to travel west. Venice Boulevard provides six lanes of traffic, separated by a median that is landscaped in some locations. Primary uses along Venice Boulevard are commercial and retail, with some multi-family residential structures. The route then turns north on Sepulveda Boulevard, which is lined with multi-family residential structures, with commercial uses at major intersections. As the route returns to Exposition Boulevard (just south of Pico Boulevard), the primary land uses are industrial and commercial, and these uses continue into Santa Monica, with the exception of single-family residential structures located to the south of the right-of-way between Bundy Drive and Centinela Avenues. The route then turns onto Olympic Boulevard, which is fronted primarily by commercial and industrial uses until the (light rail transit) route reaches Ocean Avenue. For bus rapid transit, the route would travel north on 17th Street, then west on Colorado Avenue. Along this segment, the adjacent land uses are primarily commercial and industrial.

With the exception of the segment between Figueroa Street and Vermont Avenue, most land uses along the Exposition Corridor are low-rise in nature. The University of Southern California and the Coliseum contain low- to mid-rise structures, separated by substantial landscaping and pockets of open space. The residential uses between Vermont and La Brea Avenues provide landscaped frontages, with street trees in many areas. The industrial and commercial uses along the western portions of Exposition Boulevard provide little or no setback, and little or no landscaping. As a result, the visual character of the route along this portion of Exposition Boulevard varies greatly.

Because of the predominant industrial land uses along Jefferson Boulevard, and the lack of landscaping along the ROW, the visual character of this segment is stark, and in some stretches, lacks any aesthetically pleasing features. The presence of landscaped setbacks, landscaping along

Figure 3.7-9 Street-Level Views of the Exposition Corridor (USC Area)

Figure 3.7-10 Steet-Level Views of the Exposition Corridor (La Cienega Blvd and Venice Blvd)

Figure 3.7-11 Street-Level Views of the Exposition Corridor (Pico Blvd & Olympic Blvd)

Figure 3.7-12 Steet-Level Views of the Exposition Corridor (Olympic Blvd. & 17th Street) portions of the median, and the width of Venice Boulevard, makes this segment noticeably spacious. The Sepulveda Boulevard segment is lined primarily with low-rise residential structures and some landscaping, but there is little variation in visual character. The ROW along Exposition Boulevard between Sawtelle Boulevard and Bundy Drive is industrial in character, with major portions of the ROW existing as unvegetated land between fences, with trash and graffiti being the most noticeable features. As the route reaches Olympic Boulevard, the visual character improves substantively, because of the landscaped median with specimen-sized Coral trees and other street trees. The segment along 17th Street and Colorado Avenue contains primarily nondescript industrial uses; however, the presence of street trees and landscaping in some building frontages provides some visual relief.

The visual characteristics of the Exposition Corridor, including the width of the roadway (or ROW), presence of a landscaped median, predominant land uses along the Corridor, the scale of buildings along the corridor, the major scenic views of and from the corridor, and substantive visual elements, including open space resources, are noted in Table 3.7-1. In addition, Figures 3.7-13 through 3.7-17 provide oblique aerial photographs of representative locations along the Exposition Corridor.

TABLE 3.7-1 CORRIDOR VISUAL CHARACTERISTICS				
Segment	**Width of Roadway or Right-of-Way (Median)**	**Land Uses Along Corridor**	**Scale of Adjacent Buildings**	**Scenic Views/ Visual Elements**
Wilshire Corridor				
Wilshire Boulevard Western to Wilton	70 feet No median	Office, Retail	Mid-to Hi-Rise	**Views**: Hollywood Hills **Visual Elements**: street trees
Wilton to Highland	70 feet No median	Office, Multi-Family Residential	Low-to Mid-Rise	**Views**: Wilshire Corridor, adjacent residential streets **Visual Elements**: landscaped residences, landscaping in building frontages, John Burroughs Middle School
Highland to La Brea	70 feet No median	Office, Retail	Mid-to Hi-Rise	**Views**: Adjacent residential streets **Visual Elements**: landscaped median, landscaping in building frontages
La Brea to Fairfax	75 feet 14 foot landscaped median	Museum District, Office, Retail	Mid-to Hi-Rise	**Views**: Hollywood Hills, Hancock Park, Santa Monica Mountains **Visual Elements**: landscaped median, landscaping in building frontages, Art Deco commercial buildings, La Brea Tar Pits, County Museum buildings
Fairfax to San Vicente	75 feet No median	Retail, Office	Mid-to Hi-Rise	**Views**: Hollywood Hills **Visual Elements**: street trees
San Vicente to Santa Monica	70 feet No median (some planters)	Retail, Office	Mid-to Hi-Rise	**Views**: Wilshire Corridor, Santa Monica Mountains, adjacent residential streets **Visual Elements**: street trees, landscaped median (discontinuous)
Santa Monica to Comstock	75 feet No median	Retail, Residential, Open Space	Low-to Mid-Rise	**Views**: Downtown Los Angeles **Visual Elements**: street trees, landscaping in building frontages, Beverly Gardens Park, El Rodeo School, Los Angeles Country Club
Comstock to Westholme	80 feet No median	Residential	Low-to Hi-Rise	**Views**: Wilshire Corridor **Visual Elements**: landscaping in building frontages
Westholme to Veteran	104 feet No median	Residential, Office	Low-to Hi-Rise	**Views**: Wilshire Corridor, Westwood Village **Visual Elements**: landscaping in building frontages
Veteran to Federal	80 feet No median	Institutional	Low- to Mid-Rise	**Views**: Santa Monica Mountains, Westwood Village **Visual Elements**: Veterans Affairs grounds, Wadsworth Hospital, Wadsworth Theater, Federal Building grounds
Federal to Centinela	75 feet No median	Retail, Office	Mid-to Hi-Rise	**Views**: Wilshire Corridor **Visual Elements**: intermittent street trees
Centinela to Lincoln	85 feet No median	Retail, Office	Low-to Mid-Rise	**Views**: Santa Monica Mountains, Pacific Ocean **Visual Elements**: Douglas Park, street trees (palms)

TABLE 3.7-1
CORRIDOR VISUAL CHARACTERISTICS

Segment	Width of Roadway or Right-of-Way (Median)	Land Uses Along Corridor	Scale of Adjacent Buildings	Scenic Views/ Visual Elements
Lincoln to Ocean	85 feet No median	Retail, Office	Mid-Rise	**Views**: Santa Monica Mountains, Pacific Ocean, Wilshire Corridor **Visual Elements**: Christine Emerson Reed Park, street trees (palms)
Exposition Corridor				
Flower Street from Washington to Exposition	90 feet No Median	Industrial, Office	Low- to Mid-Rise	**Views**: Downtown Los Angeles, San Gabriel Mountains, Convention Center **Visual Elements**: street trees
Exposition from Figueroa to Vermont	107 feet 23 foot landscaped median	Institutional	Low-to Mid-Rise	**Views**: University of Southern California, Exposition Park complex **Visual Elements**: landscaped median, street trees
Vermont to Arlington	107 feet 25 foot Landscaped median	Single- and Multi-Family Residential	Low-Rise	**Views**: Hollywood Hills, Baldwin Hills **Visual Elements**: West Adams residences and landscaping, Foshay Middle School
Arlington to La Brea	50 feet No median	Single- and Multi-Family Residential, Industrial	Low-Rise	**Views**: Hollywood Hills, Santa Monica Mountains **Visual Elements**: Dorsey High School, Rancho Cienega Sports Center
La Brea to Ballona Creak	50 feet No median	Industrial, Single- and Multi-Family Residential	Low-Rise	**Views**: Baldwin Hills, Hollywood Hills, Baldwin Hills **Visual Elements**: Landscaped residences, Baldwin Hills Recreation Center
Ballona Creek to Robertson	50 feet No median	Industrial, Single- and Multi-Family Residential	Low-Rise	**Views**: Baldwin Hills **Visual Elements**: Landscaping in building frontages
Venice from Washington to Motor	108 feet 14 foot landscaped median	Retail, Industrial, Single- and Multi-Family Residential	Low- to Mid-Rise	**Views**: San Gabriel Mountains, Baldwin Hills **Visual Elements**: landscaped median, street trees, landscaped building frontages, Media Park
Motor to Sepulveda	108 feet 14 foot landscaped median	Retail, Multi-Family Residential	Low-Rise	**Views**: Santa Monica Mountains, Westchester area **Visual Elements**: landscaping in building frontages, street trees
Sepulveda from Venice to Olympic	60 to 70 feet No median	Industrial, Office, Retail, Multi-Family Residential	Low-Rise	**Views**: Santa Monica Mountains **Visual Elements**: Charnock Road School, street trees, landscaping in building frontages.
Exposition From Sepulveda to Centinela	100 feet No median	Industrial, Single-Family Residential	Low-Rise	**Views**: Santa Monica Mountains **Visual Elements**: landscaping in building frontages
Centinela to Cloverfield	110 feet Landscaped (west of Centinela)	Industrial, Office	Low- to Mid-Rise	**Views**: Santa Monica Mountains **Visual Elements**: landscaped median, street trees

TABLE 3.7-1
CORRIDOR VISUAL CHARACTERISTICS

Segment	Width of Roadway or Right-of-Way (Median)	Land Uses Along Corridor	Scale of Adjacent Buildings	Scenic Views/ Visual Elements
Olympic Cloverfield to Ocean Avenue	110 feet Landscaped (until 10th Street)	Industrial, Retail, Office	Low-Rise	**Views**: Santa Monica Mountains, **Visual Elements**: landscaped median, street trees, Memorial Park
Colorado 17th Street to Ocean	70 feet No median	Industrial, Retail, Office	Low-Rise	**Views**: Santa Monica Mountains **Visual Elements**: landscaping in building frontages

Figure 3.7-13 Oblique Aerial Photograph of Exposition Corridor (USC/Exposition Park)

Figure 3.7-14 Oblique Aerial Photograph of Exposition Corridor (Crenshaw Blvd.)

Figure 3.7-15 Oblique Aerial Photograph of Exposition Corridor (La Brea)

Figure 3.7-16 Oblique aerial Photograph of Exposition Corridor (La Cienega Blvd)

Figure 3.7-17 Oblique Aerial Photograph of Exposition Corridor (Santa Monica)

3.7.3 Impact Assessment and Mitigation Measures

Standards of Significance

Based upon a review of relevant documents, including previous environmental documents related to transit improvements on the Westside, the Scenic Highway element of the City of Los Angeles, and the Community Plans and Specific Plans that cover the areas along both the Wilshire Boulevard and Exposition Corridors, the following Standards of Significance have been developed.

A significant adverse visual impact would occur if the alternatives considered would:

- Obstruct or adversely changed the object of sensitive views;
- Result in the loss of a substantial number specimen trees;
- Result in the removal of a landscaped median, or would reduce the median to less than 8 feet in width, along the segment of Wilshire Boulevard that is a designated scenic highway;
- Make available views that result in a loss of privacy to residences;
- Create major new sources of light that would intrude on neighboring residential areas; or
- Create excessive glare that pose major hazards or annoyances to nearby residents.

Methodology for Impact Evaluation

Analysis of impacts to visual character is subjective by nature, since the qualities that create an aesthetically pleasing setting or that result in the perception of a visual element as aesthetically positive or negative will vary from person to person.

For the purposes of this analysis, both transit corridors (Wilshire Boulevard and the Exposition ROW) were surveyed to identify the presence or absence of a landscaped median, the predominant land uses along the corridor, the scale of adjacent buildings along the corridor, the major scenic views that are available along segments of the corridor, and substantive visual elements along the corridor, including open space resources, street trees, and landscaping in building frontages.

The potential effects of the proposed alternatives were characterized, including installation of the bus rapid transit or light rail facilities, including physical structures such as revised medians, tracks, stations (including ramps, platforms, fare vending equipment, and canopies to protect riders), overhead contact and power lines, parking lots, and in some locations, elevated guideways and station platforms. The potential for these physical features to result in the removal of existing features, including roadway medians (and landscaping), street trees, and other existing visual elements was noted. In addition, the potential for these new features to eliminate, obstruct, or otherwise degrade existing scenic views was also noted. The potential for new landscaping, street furniture, and other amenities was also considered, which could, in some locations, reduce the negative or adverse impacts that could result from installation of the project's physical features. Conceptual illustrations of the physical elements of the BRT and LRT systems are provided by

Figures 2-2A, 2-2B, 2-5, 2-11, 2-12, 2-10, and 2-35, which are provided in Section 2.0 (Alternatives Considered) of this document.

For the purposes of this analysis, sensitive views are those which are depicted in the City of Los Angeles General Plan as being "scenic" or are considered "unique" in the area, or they are considered to be of special significance to the community for social or cultural reasons. Street trees refers to trees that are located in the parkway or in the sidewalk (trees located within the Exposition right-of-way in the middle of Exposition Boulevard are discussed in the context of median landscaping). Specimen-size trees refer to trees that are larger than eight inches in diameter at four feet above the ground.

Impacts

No Action Alternative (Baseline)

Removal and/or addition of median landscaping. The No Action Alternative would not result in the installation of any physical structures, and no roadway medians would be removed, including those segments that are landscaped. Therefore, the visual effects related to removal and/or addition of median landscaping would not occur.

Removal and/or addition of street trees. The No Action Alternative would not result in the installation of any physical structures, such as stations in the median, which would require widening of the roadway, and the resultant narrowing of sidewalks. Therefore, no removal of street trees would occur.

Installation of physical structures on sensitive views. The No Action Alternative would not result in the installation of any physical structures; therefore, no sensitive views would be obstructed or adversely impacted.

Introduction of new sources of light and glare on adjacent residences, vehicle occupants, or pedestrians. The No Action Alternative would not result in the installation of any new sources of light and glare; therefore, no impacts would occur.

Installation of physical structures could result in a loss of privacy to adjacent uses. The No Action Alternative would not result in the installation of any physical structures which would reduce privacy to adjacent uses, such as residences; therefore, no loss of privacy would occur.

Transportation System Management (TSM) Alternative

Removal and/or addition of median landscaping. The TSM Alternative would not result in the installation of any physical structures and no roadway medians would be removed, including those segments that are landscaped. Therefore, visual effects related to removal and/or additional of median landscaping would not occur.

Removal and/or addition of street trees. The TSM Alternative would not result in the installation of any physical structures, such as stations in the median, which would require widening of the roadway, and the resultant narrowing of sidewalks. Therefore, no removal of street trees would occur.

Installation of physical structures on sensitive views. The TSM Alternative would not result in the installation of any physical structures; therefore, no sensitive views would be obstructed or adversely impacted.

Introduction of new sources of light and glare on adjacent residences, vehicle occupants or pedestrians. The TSM Alternative would not result in the installation of any new sources of light and glare; therefore, no impacts would occur.

Installation of physical structures could result in a loss of privacy to adjacent uses. The TSM Alternative would not result in the installation of any physical structures, which would reduce privacy to adjacent uses, such as residences; therefore, no loss of privacy would occur.

Alternative 1: Wilshire BRT (Baseline Median-Running)

Removal and reconstruction of median landscaping. In order to preserve at least two traffic lanes in each direction, installation of dedicated bus lanes in the center of Wilshire Boulevard would require removal of the existing median and reconstruction of a new median (including any street lighting that was removed) on either side of the bus lanes. As a result, most portions of the existing median would be removed, including those segments that are currently landscaped east of Fairfax Avenue (estimated to be 14 feet in width) and in Beverly Hills. In some locations, the existing medians contain trees of notable height. New medians would be installed along the entire length of the corridor, including new landscaped islands (up to ten feet in width and with varying lengths); however, these islands would be discontinuous, and would not occur at station locations or where left turn lanes are provided. Although the net amount of landscaping in the median along the length of Wilshire Boulevard would increase, because the existing median east of Fairfax Avenue (which is 14 feet in width) would generally be removed, and since Wilshire Boulevard is designated as a scenic highway by the City of Los Angeles, the removal and reconstruction of the landscaped median would result in an adverse visual impact.

Since removal of the existing landscaped median and reconstruction (to less than eight feet in width) is considered a significant impact, Mitigation Measure 3.7-1 is required to reduce the adverse significant visual impact that would result from implementation of the Wilshire BRT:

- *Mitigation Measure 3.7-1:* To the extent feasible, relocate specimen trees in the existing median to new locations, either as street trees (along the parkway or within the sidewalks) or within the new or reconstructed median.

Although this mitigation measure would reduce adverse visual impacts, because the existing landscaped median would be removed along the segment of Wilshire Boulevard that is designated a scenic highway, the impact of the Wilshire BRT would be a significant, unavoidable impact. However, both Alternative 1A, the Median Adjacent Design Option, and Alternative 1B, the Curb Adjacent Design Option, would avoid removal and reconstruction of the existing median, thereby avoiding the significant, unavoidable impacts caused by implementation of Alternative 1 (refer to the following section for a discussion of impacts resulting from construction and implementation of Alternatives 1A and 1B).

Removal and/or addition of street trees. At most station locations on Wilshire Boulevard, installation of the station platform (approximately 11' in width by 100' in length) in the median would require widening the street up to two feet for the entire length of the platform. This could result in the removal of street trees at those locations; however, these impacts would be limited to the 14 locations where stations would be installed. Further, this alternative would include installation of new landscaping at each station, and it is assumed this would include replacement of any street trees removed as a result of the street widening.

Replacement parking is proposed for the Wilshire BRT, but it is not known at this time exactly where the replacement parking will be located or how many parking spaces must be provided. Nonetheless, as further discussed in Section 3.3, a replacement parking strategy has been developed to reduce impacts related to the loss of on-street parking to the maximum extent practicable. Installation of the replacement parking lots are not anticipated to require removal of any street trees. However, to the extent that installation of access driveways do result in the removal of street trees, it is assumed that new landscaping would be provided, and this landscaping would generally replace any street trees that are removed. Therefore, the impact of Wilshire BRT on street trees is considered less than significant.

Installation of physical structures on sensitive views. Installation of the dedicated bus rapid transit lanes in the middle of Wilshire Boulevard would require removal and reconstruction of the existing median and installation of platforms (including ramps, platforms, fare vending equipment, and canopies to protect riders) at major intersections. The location of the proposed stations (for Alternative 1, as well as Alternatives 2 and 3) is shown on Table 3.7-2. The proposed canopy structures would be approximately 10 to 12 feet in height (with poles and luminaries that are up to 17 feet in height at the canopy locations) and approximately 13 feet in length. The structures are modular, and where more than one is provided, there will be limited space in between. Therefore, for standard 40-foot buses, two canopies would be 30-feet long. For articulated buses, the canopies would be 45-feet long for three doors and 60-feet long for four doors (depending on bus design). Although the canopy could obstruct the view of ground floor structures and uses located on the opposite side of the street, these impacts would be limited to the 14 station locations (at major intersections) where existing structures already limit views to some extent. The station locations would be illuminated, with light standards that could reach 17 feet in height at canopy locations and up to 20 feet in height for the standard pedestrian lights. Because of the limited height of the canopy structures and the number of locations, sensitive views would not be adversely impacted by the Wilshire BRT, and a less than significant impact would result.

As further discussed in Section 3.3, a replacement parking strategy has been developed for the Wilshire BRT to reduce impacts related to the loss of on-street parking to the maximum extent practicable; however, it is not known at this time exactly where the replacement parking will be located or how many parking spaces will be provided. Nonetheless, the replacement parking location(s) are not anticipated to contain any large vertical elements that would obstruct or degrade sensitive views. Less than significant impacts related to the construction and operation of the replacement parking lot(s) would occur.

TABLE 3.7-2
MTA MID-CITY/WESTSIDE CORRIDOR
PROPOSED STATION LOCATIONS

	Alternatives 1, 2 & 3 Wilshire BRT	Alternative 2 Exposition BRT	Alternative 3 Exposition LRT
7th/Flower		■	■
Figueroa/Pico		■	
Pico/Flower			■
Figueroa/Adams		■	
Washington/Grand			■
Figueroa/Jefferson		■	
I-110/USC/Exposition Park		■	■
Vermont		■	■
Western	■	■	■
Crenshaw	■	■	■
La Brea	■	■	■
Fairfax	■		
La Cienega (Aerial for Alt 2 and 3)	■	■	■
National/Hayden		■	
Robertson	■		
Venice/Main		■	
Venice/Washington			■
Beverly	■		
Venice/Overland		■	■
Santa Monica	■		
Venice/Sepulveda		■	■
Westwood Village	■		
Sepulveda/National		■	■
Barrington	■		
Pico/Sawtelle (Aerial for Alt 2 and 3)		■	■
Bundy (Aerial for Alt 2 and 3)	■	■	■
Cloverfield			■
Ocean/Colorado			■
Wilshire/14th.	■		
Cloverfield (Aerial)		■	■
Wilshire/4th	■		
Colorado /14th		■	
Ocean	■		■

Introduction of new sources of light and glare on adjacent residences, vehicle occupants or pedestrians. Installation of station platforms in the median would occur at major intersections (as shown on Table 3.7-2). Each platform would be illuminated to enhance security and ensure visibility of patrons to both bus drivers and passing motorists. However, as the platforms would be located at major intersections, it is not anticipated that the installation of lighted platforms would substantially increase ambient light levels at those locations. Some glare impacts could occur due to the headlights of the buses, which generally would not be screened by landscaping in the median (as the new median landscaping will be discontinuous). However, given existing traffic volumes on Wilshire Boulevard, the addition of the BRT with regard to light and glare would result in less than significant impacts.

Replacement parking would be illuminated for security purposes, and the presence of security lighting and the glare from vehicle headlights could result in significant light and glare impacts on the adjacent residences. To reduce the potential impacts caused by replacement parking, Mitigation Measure 3.7-2 will be implemented:

- *Mitigation Measure 3.7-2:* All lighting in replacement parking lots shall utilize Best Available Technology to reduce spillover to adjacent land uses. In addition, all lighting in replacement parking lots shall be directed away from adjacent residences and landscaping, fences, or other measures shall be provided to shield adjacent residences from light and glare produced by light standards and vehicle headlights.

With implementation of this mitigation measure, the impact of Wilshire BRT on light and glare would be less than significant.

Installation of physical structures could result in a loss of privacy to adjacent uses. Installation of platforms in the median (including ramps and platforms) would slightly elevate patrons above the existing street level; however, as the BRT system is designed to accommodate low-floor buses, the elevation of the platforms would only be a few inches above the existing pavement. Further, the platform surface may not be higher than the existing median. Therefore, patrons standing on the platforms would not have access to any views (of adjacent uses) that would result in a loss of privacy.

The installation of the replacement parking could be located adjacent to existing residential uses, which could provide opportunities for patrons of the parking lots to have views into residences, and this loss of privacy is considered a significant impact. This would be a significant, mitigable impact that could be reduced to less-than-significant levels with the implementation of Mitigation Measure 3.7-3.

- *Mitigation Measure 3.7-3:* Provide landscaping, fences, or other measures that would reduce or eliminate direct views from replacement parking lots into adjacent residences.

With implementation of this mitigation measure, the impact of Wilshire BRT on loss of privacy would be less than significant.

Alternative 1A: Wilshire BRT (Median Adjacent Design Option)

With this design option, all components of the Wilshire BRT would be the same, except the BRT would operate exclusively in the existing lanes adjacent to the median and the existing median landscaping would be retained in place. Therefore, the significant and unavoidable impact related to the removal and reconstruction of median landscaping would be avoided and no impacts would occur. In addition, all of the other impacts resulting from construction and implementation of Alternative 1A would be identical to Alternative 1, and less than significant or significant, mitigable impacts would occur.

Alternative 1B: Wilshire BRT (Curb Adjacent Design Option)

With this design option, all components of the Wilshire BRT would be the same, except the BRT would operate exclusively in the existing lanes adjacent to the curb and the existing median landscaping would be retained in place. Therefore, the significant and unavoidable impact related to the removal and reconstruction of median landscaping would be avoided and no impacts would occur. In addition, all of the other impacts resulting from construction and implementation of

Alternative 1B would be identical to Alternative 1, and less than significant or significant, mitigable impacts would occur.

Alternative 2: Wilshire BRT and Exposition BRT (Full Length)

Alternative 2 would consist of the Wilshire BRT and the full length of the Exposition BRT described in Section 2.0 (Alternatives Considered).

Removal and reconstruction of median landscaping. Installation of the Wilshire BRT would require removal and reconstruction of the median on Wilshire Boulevard, which is landscaped between La Brea and Fairfax Avenues and at some locations in the City of Beverly Hills. This would result in a significant adverse visual impact. Although this impact could be reduced with implementation of Mitigation Measure 3.7-1, this impact would remain a significant unavoidable impact for Wilshire Boulevard without the implementation of the design options proposed by Alternatives 1A and 1B.

Installation of the dedicated BRT lanes in the middle of Exposition Boulevard would require removal of the median and reconstruction of landscaping in the segment west of Vermont Avenue, which has a substantial number of trees planted in the right-of-way, including some specimen trees of notable height. At certain locations, the existing landscaped median will remain, as well as some specimen trees located west of Vermont Avenue. However, some of the landscaping and trees would be removed in these segments. The removal of these trees would result in a significant, mitigable visual impact. Therefore, Mitigation Measure 3.7-4 is required to reduce the adverse significant visual impact that would result from implementation of the Exposition BRT:

- *Mitigation Measure 3.7-4:* To the extent feasible, relocate specimen trees in the existing median to new locations, either as street trees (along the parkway or within the sidewalks) or within the new or reconstructed median.

This mitigation measure would reduce the adverse visual impacts the impact of Exposition BRT to a less-than-significant level.

Removal and/or addition of street trees. Installation of the station locations for Wilshire BRT would require widening the street approximately two feet, which could result in the removal of some street trees; however, installation of new landscaping would replace any street trees removed. Furthermore, installation of replacement parking is not anticipated to require removal of any street trees. Therefore, the impact of Wilshire BRT on street trees would be a less than significant impact.

Installation of the Exposition BRT would not require widening of the roadway to install station platforms; therefore, street trees would not be removed. Installation of park-and-ride lots (at Crenshaw Boulevard, La Brea Boulevard, La Cienega Boulevard, Venice Boulevard/Washington Boulevard, Pico Boulevard/Sawtelle Boulevard, Bundy Drive, Cloverfield Boulevard, and Ocean Avenue/Colorado Avenue) could require removal of street trees at access driveway locations; however, installation of landscaping would be included at the park-and-ride lots, and it is assumed that any street trees removed by access driveways would be replaced as part of the landscaping plan for the lot. Therefore, the impact of Exposition BRT on street trees would be less than significant.

Installation of physical structures on sensitive views. Installation of the Wilshire BRT lanes and station platforms and provision of replacement parking would not obstruct or substantially degrade any scenic views, and would result in less than significant impacts to sensitive views.

Installation of the Exposition BRT would require removal and/or reconstruction of the existing median, and installation of platforms (including ramps, platforms, fare vending equipment, and canopies to protect riders) at major intersections. The location of the proposed stations is shown on Table 3.7-2. The proposed canopy structures would be approximately 10 to 12 feet in height (with poles and luminaries that are up to 17 feet in height at the canopy locations) and approximately 13 feet in length. The structures are modular, and where more than one is provided, there will be limited space in between. Therefore, for standard 40-foot buses, two canopies would be 30-feet long. For articulated buses, the canopies would be 45-feet long for three doors and 60-feet long for four doors (depending on bus design). Although the canopy could obstruct the view of ground floor structures and uses located on the opposite side of the street, these impacts would be limited to the 20 station locations at major intersections where existing structures already limit views to some extent. The station locations would be illuminated, with light standards that could reach 17 feet in height at the canopy locations and up to 20 feet in height for the standard pedestrian lights. Therefore, because of the limited height of the canopy structures and the number of locations, sensitive views would not be adversely impacted by the at-grade elements of the Exposition BRT. This would be a less than significant impact.

Some segments of the Exposition BRT would be elevated (at La Cienega Boulevard, Pico/Sawtelle Boulevard, and at Bundy Drive), and those elevated segments (except over Ballona Creek) would include stations. The elevated segments would vary in length, but would generally be approximately 22 feet in height, with a parapet wall and canopy at station locations. Elevated structures of that height have the potential to obstruct or adversely change the object of sensitive views at the locations where the elevated structures are installed. As described in Table 3.7-1, views of the Hollywood Hills and Baldwin Hills are currently available in the vicinity of Jefferson and La Cienega Boulevards, and views of the Baldwin Hills are available along Jefferson Boulevard near Ballona Creek. Views of the Santa Monica Mountains are available from the areas around Sawtelle and Pico Boulevards, Exposition and Bundy Drive, and at Cloverfield Avenue. Installation of the elevated segments at these locations would obstruct or adversely change these north-south views, and would result in significant adverse visual impacts. Mitigation of this impact could include the conversion of the project to an "at-grade" design or conversion of the project to a "below-grade" design. However, neither of these potential mitigation measures are considered feasible. The conversion of the project to an "at-grade" design would result in additional significant traffic impacts, and the conversion of the project to a "below-grade" design would be cost prohibitive (e.g., $50 to $100 million per below ground separation). However, Mitigation Measure 3.7-5 will be implemented to reduce impacts on sensitive views at Pico/Sawtelle and Bundy to a less-than-significant level. There are no sensitive views in the vicinity of the elevated segment of the Exposition LRT at La Cienega.

- *Mitigation Measure 3.7-5:* Structure design, screening, and landscaping shall be included as part of the station area planning process conducted with local communities.

Introduction of new sources of light and glare on adjacent residences, vehicle occupants or pedestrians. Installation of replacement parking for the Wilshire BRT (at Crenshaw Boulevard and at La Brea Avenue) could result in significant light and glare impacts to residences near the Crenshaw lot. However, these impacts are significant, mitigable impacts that can be mitigated to a less-than-significant levels with implementation of Mitigation Measure 3.7-2.

Installation of station platforms for Exposition BRT (at the locations shown on Table 3.7-2) would include provision of appropriate lighting to illuminate the platform and ensure visibility of patrons to both the bus drivers and passing motorists. This could result in light and glare impacts to adjacent residential uses. Park-and-ride lots would be installed at several locations along the route, including Exposition and Sepulveda Boulevard, Exposition and Barrington Avenue, Exposition and Bundy Drive, and Olympic Boulevard and 26th Street. These lots would be provided with lighting for security purposes, and headlights from vehicles (and passing buses) could result in light and glare impacts to adjacent residences.

Because of the proximity of residential uses to the ROW, the park-and-ride lots, and the elevated stations, the Exposition BRT could result in significant light and glare impacts to adjacent residential uses. To reduce these impacts, Mitigation Measure 3.7-6 will be implemented:

- *Mitigation Measure 3.7-6:* All lighting at the park-and-ride lots and station locations shall utilize Best Available Technology to reduce spillover to adjacent land uses. In addition, all lighting at park-and-ride lots and station locations shall be directed away from adjacent residences and landscaping, fences, or other measures to shield adjacent residences from light and glare produced by light standards and vehicle headlights.

This mitigation measure would reduce impacts at some at-grade segments to a less than significant level; however, impacts along segments where the right-of-way is only 50 feet in width, and at those locations where the stations would be elevated, would remain significant and unavoidable.

Installation of physical structures could result in a loss of privacy to adjacent uses. The replacement parking proposed for the Wilshire BRT could be located adjacent to some existing residential uses, which could provide opportunities for patrons of the parking lots to have views into residences. This would be a significant, mitigable impact that could be mitigated to a less-than-significant level with implementation of Mitigation Measure 3-7.3.

Installation of stations for the Exposition BRT (including ramps and platforms) would elevate patrons above the existing street level; however, since the system is designed to accommodate low-floor buses, the elevation of the platforms would only be a few inches above the existing pavement. Therefore, bus patrons would not have access to views of adjacent residences (along the at-grade segments). At those locations where the route would be located on aerial structures, bus riders would have access to views into residences, or the yards of residences at those locations. Similarly, bus patrons waiting at elevated stations could have views that would result in a loss of privacy for residential uses located near stations. Mitigation of this impact could include : (1) the provision of solid parapet walls along all elevated segments; (2) conversion of the project to an "at-grade" design; or (3) conversion of the project to a "below-grade" design. However, none of these potential mitigation measures are considered feasible. The provision of solid parapet walls along all elevated segments would exacerbate impacts related to the obstruction or degradation of scenic views. The conversion of the project to an "at-grade" design would result in additional significant traffic impacts, and the conversion of the project to a "below-grade" design would be cost prohibitive (e.g., $50 to $100 million per below ground separation). However, Mitigation Measure 3.7-7 will be implemented to reduce impacts associated with the loss of privacy:

- *Mitigation Measure 3.7-7*: Provide landscaping, fences, or other measures that will reduce or eliminate direct views from elevated station platforms into adjacent residences. The specific design features will be determined through a planning process with the communities affected by the aerial structures.

Loss of privacy impacts resulting from the elevated segments of the Exposition BRT in adjacent residences near Pico/Sawtelle and Bundy would be less than significant with implementation of Mitigation Measure 3.7-7. There are no adjacent residences in the vicinity of the elevated segment of the Exposition BRT at La Cienega that would be affected by a loss of privacy.

Mitigation of this impact could involve provision of solid parapet walls along all elevated segments; however, this would increase the visual mass of the elevated structures, which would exacerbate impacts related to obstruction or degradation of scenic views, and is, therefore, considered infeasible. The impacts of the elevated segments of Exposition BRT on loss of privacy would be significant and unavoidable.

Alternative 2A: Wilshire BRT and Exposition BRT (MOS)

The Exposition BRT MOS component of Alternative 2 would terminate at he Venice/Washington Station. Given that the Wilshire BRT impacts have been disclosed above, and the MOS option of the Exposition BRT is only a shorter route of the full-length alternative, the visual quality impacts resulting from construction and operation of Alternative 2A would be similar to Alternative 2. Any visual quality impacts west of the Venice/Washington Station would not occur, and no increased visual quality impacts would occur at the westernmost MOS station location. Impacts would be less than significant.

Alternative 3: Wilshire BRT and Exposition LRT (Full Length)

Removal and reconstruction of median landscaping. Installation of the BRT on Wilshire Boulevard would require removal and reconstruction of the median, which is landscaped east of Fairfax Avenue and at some locations in the City of Beverly Hills, which would result in a significant adverse visual impact. Although this impact could be reduced with implementation of Mitigation Measure 3.7-1, the visual impact of Wilshire BRT related to removal of landscaped medians would remain significant and unavoidable; however, this would not be true if design options 1A or 1B were selected.

Installation of the LRT tracks in the middle of the Exposition Boulevard would require removal of the median and reconstruction of landscaping in the segment west of Vermont Avenue, which has a substantial number of trees planted in the right-of way, including some specimen trees of notable height. At certain locations, the existing landscaped median (between Figueroa Street and Vermont Avenue) will remain, as well as some specimen trees located west of Vermont Avenue. However, some of the landscaping and specimen trees would be removed in these segments. The removal of these trees would result in a significant, mitigable visual impact.

LRT would also require the removal of a maximum of three coral trees from the Olympic Boulevard median west of Cloverfield. Other coral trees in the Olympic Boulevard median would likely require substantial trimming to avoid conflicts with overhead catenary wiring.

Since removal of the existing landscaping along Exposition (west of Vermont Avenue) would result in an adverse visual impacts, Mitigation Measure 3.7-8 is required to reduce the adverse significant visual impact that would result from implementation of the Exposition LRT to a less-than-significant level:

- *Mitigation Measure 3.7-8:* Relocate specimen trees in the existing median to new locations, either as street trees (along the parkway or within the sidewalks) or within the new or reconstructed median. Prepare a landscaping plan that includes a grass trackbed for LRT in the segment in Exposition Park.

This mitigation measure would reduce the adverse visual impacts the impact of Exposition BRT to a less-than-significant level.

Removal and/or addition of street trees. Installation of the station locations for Wilshire BRT would require widening the street approximately two feet, which could result in the removal of some street trees; however, installation of new landscaping would replace any street trees removed. Furthermore, installation of replacement parking is not anticipated to require removal of any street trees. Therefore, the impact of Wilshire BRT on street trees would be less than significant.

Installation of the Exposition LRT would not require widening of the roadway (or ROW) to install station platforms; therefore, street trees would not be removed. Installation of park-and-ride lots (at Exposition and Sepulveda Boulevard, Exposition and Barrington Avenue, Exposition and Bundy Drive, and Olympic Boulevard and 26th Street) could require removal of street trees at access driveway locations; however, installation of landscaping would be included at the park-and-ride lots, and it is assumed that any street trees removed by access driveways would be replaced as part of the landscaping plan for the lot. Therefore, the impact of Exposition LRT on street trees would be less than significant.

Installation of physical structures on sensitive views. Installation of the Wilshire BRT lanes, station platforms, and provision of replacement parking would not obstruct or substantially degrade any scenic views, and would result in less than significant impacts to sensitive views.

Installation of the Exposition LRT would require removal and reconstruction of the existing median and installation of platforms (including ramps, platforms, fare vending equipment, and canopies to protect riders) at major intersections. The location of the proposed stations is shown on Table 3.7-2. The proposed canopy structures would be approximately 10 to 12 feet in height (with poles and luminaries that are up to 17 feet in height at the canopy locations) and approximately 13 feet in length. The structures are modular and where more than one is provided, there will be limited space in between. Therefore, for standard 40-foot buses, two canopies would be 30-feet long. For articulated buses, the canopies would be 45-feet long for three doors and 60-feet long for four doors (depending on bus design). Although the canopy could obstruct view of ground floor structures and uses located on the opposite side of the street, these impacts would be limited to the 17 station locations at major intersections, where existing structures already limit views to some extent. In addition, a catenary system of overhead wires and support structures would be installed along the entire length of the route. Because of the small size of the wires and the distance between support poles, the catenary system would not create a single visual mass and, therefore, would not obstruct scenic views. Therefore, sensitive views would not be adversely impacted by the at-grade segments of the Exposition LRT. Impacts would be less than significant.

Some segments of the Exposition LRT would be elevated (at La Cienega Boulevard, at Pico/Sawtelle Boulevard, and at Bundy Drive), and those elevated segments (except over Ballona Creek) would include stations. The elevated segments would vary in length, but would generally be approximately 22 feet in height, including the parapet wall, canopy, and catenary structures In addition, the station locations would be illuminated, with light standards that could reach 20 feet in height. Elevated structures of that height have the potential to obstruct or adversely change the object of sensitive views at the locations where the elevated structures are installed. As shown in Table 3.7-1, views of the Hollywood Hills and Baldwin Hills are currently available in the vicinity of Jefferson Boulevard and La Cienega Boulevards, views of the Baldwin Hills are available along Jefferson Boulevard near Ballona Creek. Views of the Santa Monica Mountains are available from the areas around Sawtelle and Pico Boulevards, Exposition and Bundy Drive, and at Cloverfield Avenue. Installation of the elevated LRT segments at these locations would obstruct or adversely change these views, and, therefore, would result in significant adverse visual impacts at these specific locations.

Mitigation of this impact could include the conversion of the project to an "at-grade" design or conversion of the project to a "below-grade" design. However, neither of these potential mitigation measures are considered feasible. The conversion of the project to an "at-grade" design would result in additional significant traffic impacts, and the conversion of the project to a "below-grade" design would be cost prohibitive (e.g., $50 to $100 million per below ground separation). However, Mitigation Measure 3.7-5 will be implemented to reduce impacts on sensitive views at Pico/Sawtelle and Bundy to a less-than-significant level. There are no sensitive views in the vicinity of the elevated segment of the Exposition LRT at La Cienega. However the impact of the elevated segments of the Exposition LRT on sensitive views at Pico/Sawtelle and Bundy would be less than significant with the implementation of Mitigation Measure 3.7-5. There are no sensitive views in the vicinity of the elevated segment at La Cienega.

Introduction of new sources of light and glare on adjacent residences, vehicle occupants or pedestrians. Installation of replacement parking for the Wilshire BRT could result in significant light and glare impacts to nearby residences. However, these impacts can be mitigated to a less-than-significant level with implementation of Mitigation Measure 3-7.2.

Installation of station platforms for Exposition LRT (at the locations shown on Table 3.7-2) would include provision of appropriate lighting to illuminate the platform and ensure visibility of patrons to both the bus drivers and passing motorists. This could result in light and glare impacts to adjacent residential uses. Park-and-ride lots would be installed at several locations along the route, including Exposition and Sepulveda Boulevard, Exposition and Barrington Avenue, Exposition and Bundy Drive, and Olympic Boulevard and 26th Street. These lots would be provided with lighting for security purposes, and headlights from vehicles (and passing buses) could result in light and glare impacts to adjacent residences.

Some segments of the Exposition LRT would be elevated (at Jefferson and La Cienega Boulevard, over Ballona Creek, at Sawtelle and Pico Boulevards, at Bundy Drive, and at Cloverfield Avenue), and those elevated segments (except over Ballona Creek) would include stations. The station locations would be illuminated, with light standards that could reach 17 feet in height at the canopy locations and up to 20 feet in height for the standard pedestrian lights.

Because of the proximity of residential uses to the ROW, the park-and-ride lots, and the elevated stations, Exposition LRT could result in significant light and glare impacts to adjacent residential uses. To reduce these impacts, Mitigation Measure 3.7-9 will be implemented.

- *Mitigation Measure 3.7-9:* All lighting at the park-and-ride lots and station locations shall utilize Best Available Technology to reduce spillover to adjacent land uses. In addition, all lighting at park-and-ride lots and station locations shall be directed away from adjacent residences and landscaping, fences, or other measures to shield adjacent residences from light and glare produced by light standards and vehicle headlights.

This mitigation measure would reduce impacts at some at-grade segments to a less than significant level, however, impacts along segments where the right-of-way is only 50 feet in width, and at those locations where the stations would be elevated, would remain significant and unavoidable.

Installation of physical structures could result in a loss of privacy to adjacent uses. The replacement parking proposed for the Wilshire BRT could be located adjacent to some existing residential uses, which could provide opportunities for patrons of the parking lots to have views into residences, and this loss of privacy is considered a significant impact. However, this would be a significant, mitigable impact that could be mitigated to a less-than-significant level with implementation of Mitigation Measures 3.7-3.

Installation of at grade stations for Exposition LRT (including ramps and platforms) would elevate patrons above the existing street level; however the elevation of the platforms would only be a couple of feet above the existing pavement. Therefore, LRT patrons would not have substantial access to views of adjacent residences (along the at-grade segments). At those locations where the route would be located on aerial structures, riders would have access to views into residences, or the yards of residences at those locations. Similarly, patrons waiting at elevated stations could have views that would result in a loss of privacy for residential uses located near stations. Mitigation of this impact could include : (1) the provision of solid parapet walls along all elevated segments; (2) conversion of the project to an "at-grade" design; or (3) conversion of the project to a "below-grade" design. However, none of these potential mitigation measures are considered feasible. The provision of solid parapet walls along all elevated segments would exacerbate impacts related to the obstruction or degradation of scenic views. The conversion of the project to an "at-grade" design would result in additional significant traffic impacts, and the conversion of the project to a "below-grade" design would be cost prohibitive (e.g., $50 to $100 million per below ground separation). However, Mitigation Measure 3.7-7 will be implemented to reduce impacts associated with the loss of privacy at Pico/Sawtelle and Bundy to a less-than-significant level. There are no adjacent residences in the vicinity of the elevated segment of the Exposition LRT at La Cienega that would be affected by a loss of privacy.

<u>Alternative 3A: Wilshire BRT and Exposition LRT (MOS)</u>

The Exposition LRT MOS component of Alternative 3 would terminate at the Venice/Washington Station. Given that the Wilshire LRT impacts have been disclosed above, and the MOS option of the Exposition LRT is only a shorter route of the full-length alternative, the visual quality impacts resulting from construction and operation of Alternative 3A would be similar to Alternative 3. Any visual quality impacts west of the Venice/Washington Station would not occur, and no increased visual quality impacts would occur at the westernmost MOS station location. Impacts would be less than significant.

Maintenance Yard

Alternatives 1 through 3 (including the design options and the MOS options) would require storage and maintenance facilities. A new maintenance yard(s) would provide maintenance for both the BRT/Rapid Bus Systems and/or LRT system and, as such, must be centrally located to both systems (i.e., the downtown Los Angeles area). Section 2.0 (Alternatives Considered) provides a detailed description of the location of maintenance yard sites, including the screening process that was used to identify the six potentially feasible sites. In summary, six potential maintenance yard sites that are currently being considered by the MTA include:

- NW Corner of Chavez/Mission;
- Existing MTA Division I Area;
- NE Corner Alameda/Washington;
- SE Corner Alameda/Washington;
- Exposition ROW Hooper to Central; and
- Existing MTA South Park Shops.

Figures 2-16 through 2-19 in Section 2.0 (Alternatives Considered) shows the locations and physical layout of the proposed maintenance facilities. These locations are all contained within lands currently owned and operated by the MTA, and are predominately located within industrial areas with the exception of the South Park Shops site which is located in the vicinity of a residential area and school. Development of any maintenance facilities within these locations would be generally compatible with the existing industrial character of the area (e.g., height, scale, mass, lighting) and would not result in any significant visual quality impacts. However, if a maintenance yard were to be built at the existing MTA South Park Shops, the maintenance activities at the bus yard could have potential significant impacts on sensitive receptors in the surrounding residential neighborhoods. However, visual quality impacts associated with the construction and operation of the remaining proposed maintenance facilities are expected to be less than significant.

Subway Design Option at USC/Exposition Park (for Alternatives 2, 2A, 3, and 3A)

The subway design option would provide a subterranean travel corridor for either the bus or light rail alternatives of the Exposition Corridor in the USC/Exposition Park area. Construction of the subterranean travel route would require the removal and reconstruction of the existing median. Therefore, the impacts associated with this design option would be similar to the impacts that would occur under Alternative 1 with respect to the removal and reconstruction of the existing median. After construction, the subterranean segment would be covered and landscaping would be replaced in a manner similar to what exists in that segment today.

3.7.4 Cumulative Impacts

The 1998 RTP Draft Master EIR (SCAG, 1997), which is hereby incorporated by reference, provides the cumulative context for analysis of the Mid-City/Westside Transit Corridor Project. The 1998 RTP Draft Master EIR provides a programmatic analysis of visual quality impacts resulting from implementation of all projects contemplated in the RTP (SCAG, 1998), including the Mid-City/Westside Transit Corridor project, and provides the basis for this cumulative impact analysis.

Cumulative visual quality impacts could result from implementation of highway, roadway and transit projects. Projects contemplated in the RTP that do not require the construction of new facilities (e.g., optimization of the existing transportation system) could have some direct physical effects on visual quality, such as an increase in service frequency, which could increase the number of buses or rail vehicles on existing routes. Projects that require construction of new or expanded facilities (e.g., new freeways or expanded roadways or additional parking facilities) would have the greatest potential to result in adverse visual quality impacts. Projects envisioned in the RTP that would be built within existing rights-of-way would modify the existing visual character along the route, through the removal of existing physical structures, landscaping and street trees, introduction of new physical elements (including station stops, access points, lighting and rail stations or bus stops), obstruction or modification of scenic views, and loss of privacy where the new transportation projects provide views into residential structures or properties. To the extent that new highways, roads, rail service or transit projects occur in areas that are not currently urbanized, then this would result in the greatest potential for adverse visual quality impacts.

In some locations, effective mitigation of visual quality impacts would either require retention of existing visual features (e.g., landscaped medians along designated scenic highways) or modification of transit projects (e.g., elimination of elevated route segments) which would either result in secondary environmental effects or may be considered infeasible. Thus, to the extent to that adverse impacts of the projects contemplated in the RTP cannot be mitigated, the cumulative visual quality impacts would remain significant and unavoidable.

3.8A Air Quality Construction

3.8A.1 Introduction

This section discusses the air quality impacts that would result during the construction phase of the Mid-City/Westside Transit proposed project or project alternatives.

3.8A.2 Impact Assessment

Standards of Significance

The proposed project or project alternatives would have a significant impact if daily construction emissions were to exceed significance thresholds for carbon monoxide (CO), reactive organic gas (ROG), nitrogen oxides (NO_X), sulfur oxides (SO_X), or particulates (PM_{10}) as established by the SCAQMD. Significance thresholds appear in Table 3.8A-1.

TABLE 3.8A-1
SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT DAILY EMISSIONS THRESHOLDS (POUNDS PER DAY)

Criteria Pollutant	Construction
Carbon Monoxide	550
Reactive Organic Gas	75
Nitrogen Oxides	100
Sulfur Oxides	150
Particulates	150

Source: South Coast Air Quality Management District, 2000.

The proposed project or project alternatives do not contain lead, hydrogen sulfide, or sulfate emission sources. Therefore, emissions and concentrations related to these pollutants will not be analyzed in this report.

Methodology for Impact Evaluation

Daily emissions were derived using applicable emission factors and formulas found in the South Coast Air Quality Management District (SCAQMD) California Environmental Quality Act (CEQA) Handbook, Appendix 9 (1993 edition).

Impacts

<u>No Action Alternative (Baseline)</u>

Under the No Action Alternative, the proposed project or project alternatives would not be implemented. Thus, no construction would occur, and no impacts are anticipated.

Transportation System Management (TSM) Alternative

Under the TSM Alternative, the proposed project or project alternatives would not be implemented. Thus, no construction would occur, and no impacts are anticipated.

Alternative 1: Wilshire BRT (Baseline Median-Running)

The Wilshire BRT would generate pollutant emissions from the following construction activities: (1) the demolition of existing structures, (2) mobile emissions related to construction worker travel to and from project sites, (3) mobile emissions related to the delivery and hauling of construction supplies and debris to and from project sites, and (4) stationary emissions related to fuel consumption by on-site construction equipment. As detailed in the Construction Methods Technical Report prepared for the proposed project, construction would occur in several phases, lasting for a total of approximately 48 to 54 months. Construction would begin simultaneously at several locations along the route to accommodate areas requiring lengthy construction times. Construction for the Wilshire BRT consists of site preparation (which includes demolition and excavation of roadway) and the construction of the BRT travel lanes and stations. Table 3.8A-2 shows the estimated worst-case daily emissions for the construction of the Wilshire BRT. Daily emissions were derived using the applicable emission factors and formulas found in the *SCAQMD CEQA Handbook*, Appendix to Chapter 9.

TABLE 3.8A-2
DAILY CONSTRUCTION EMISSIONS (POUNDS PER DAY)
WILSHIRE BRT

Construction Phase	CO	ROG	NO_X	SO_X	PM_{10}
Site Preparation	90.4	11.6	35.0	1.2	184.1
Construction of Travel Lanes and Stations	93.3	9.0	13.5	0.6	1.1
Maximum	93.3	11.6	35.0	1.2	184.1
SCAQMD Threshold	550	75	100	150	150
Potential Threshold Violation?	No	No	No	No	Yes
Source: Terry A. Hayes Associates, 2000.					

As shown above, four of the five criteria pollutants are not expected to exceed the SCAQMD significance thresholds. The four criteria pollutants are: CO, ROG, NO_X, and SO_X. Overlapping of construction phases would not increase these four criteria pollutants to a significant level. However, PM_{10} is expected to exceed the SCAQMD significance threshold. Increasing on-site soil moisture content to 10 percent (see Mitigation Measure 3.8A-6) would reduce PM_{10} emissions to 33.7 ppd during site preparation.[1] Thus, a less than significant impact is anticipated.

[1] A three percent soil moisture content was used to calculate PM_{10} concentrations without implementation of mitigation measures. Implementation of Mitigation Measure 3.8A-6 would increase the soil moisture content to approximately 10 percent. Based on the formulas provided in Table 9-9 of the SCAQMD CEQA Air Quality Handbook, Appendix 9 (1993 edition), a soil moisture content of approximately 10 percent would reduce PM_{10} concentrations to approximately 33.7 ppd.

Alternative 1A: Wilshire BRT (Median Adjacent Design Option)

Currently, medians lie within several areas of Wilshire Boulevard. However, there are several areas along the street where no medians currently exist. Under the Median Adjacent Design Option, the existing medians would remain along Wilshire Boulevard, and minimal construction would be required within this area. In areas along the Corridor where no medians exist, medians would be constructed. Whereas the Median Reconstruction Design Option would require construction along the entire corridor, most of the construction for the Median Adjacent Design Option would occur along the Corridor where no medians exist. Thus, criteria pollutant emissions for this option would be less than the Median Reconstruction Design Option. As discussed in the section, above, the Median Reconstruction Design Option is not anticipated to exceed the SCAQMD significance thresholds. Since construction for the Median Adjacent Design Option would emit less criteria pollutants, this alternative is also not expected to exceed the SCAQMD significance thresholds. Thus, a less than significant impact is anticipated.

Alternative 1B: Wilshire BRT (Curb Adjacent Design Option)

Whereas buses would travel along the median of the road under the Median Reconstruction Design Option and the Median Adjacent Design Option, buses under the Curb Adjacent Design Option would travel along the side of the streets. Construction emissions for this option would be similar to that of the Median Reconstruction Design Option. This option would require demolition, excavation, and construction of roadway along the entire corridor, similar to that of the Median Reconstruction Design Option. Additionally, construction for this option would require the same amount of time, as well as similar types of construction activities, as the Median Reconstruction Design Option (48 to 54 months). As discussed in the section on Median Reconstruction Design Option, construction emissions would not exceed the SCAQMD significance thresholds. A less than significant impact is anticipated for this option.

Alternative 2: Wilshire BRT and Exposition BRT (Full Length)

Construction impacts for this alternative would include those for the Wilshire BRT and the Exposition BRT. The Wilshire BRT impacts are discussed above. The Exposition BRT portion of this alternative would generate pollutant emissions from the following construction activities: (1) the demolition of existing structures, (2) mobile emissions related to construction worker travel to and from project sites, (3) mobile emissions related to the delivery and hauling of construction supplies and debris to and from project sites, and (4) stationary emissions related to fuel consumption by on-site construction equipment. As detailed in the Construction Methods Technical Report prepared for the proposed project, construction would occur in several phases, lasting for a total of approximately 48 to 54 months. Construction would begin simultaneously at several locations along the routes to accommodate areas requiring lengthy construction times. Construction for the Wilshire Exposition BRT could be summarized into two categories: site preparation (which includes demolition and excavation of roadway) and the construction of the route (for travel lanes, stations, aerial structures, and park-and-ride facilities). Table 3.8A-3 shows the estimated worst-case daily construction emissions for this alternative. Daily emissions were derived using the applicable emission factors and formulas found in the *SCAQMD CEQA Handbook*, Appendix to Chapter 9.

TABLE 3.8A-3
DAILY CONSTRUCTION EMISSIONS (POUNDS PER DAY)
WILSHIRE BRT AND EXPOSITION BRT /A/

Construction Phase	CO	ROG	NO_X	SO_X	PM_{10}
Site Preparation	313.8	41.2	127.2	4.3	649.6
Construction of Alignments	353.3	37.8	78.8	3.1	8.3
Maximum	353.3	41.2	127.2	4.3	649.6
SCAQMD Threshold	550	75	100	150	150
Potential Threshold Violation?	No	No	Yes	No	Yes
/a/ Calculations assumes that construction for the Wilshire BRT and the Exposition BRT would occur simultaneously.					
Source: Terry A. Hayes Associates, 2000.					

As shown above, CO, ROG, and SO_X are not anticipated to exceed the SCAQMD significance thresholds. Additionally, overlapping of construction phases would not increase these three criteria pollutants to a significant level. However, NO_X and PM_{10} emissions would exceed the SCAQMD significance threshold of 100 and 150 ppd, respectively, which would result in a short-term significant impact. Increasing on-site soil moisture from three percent to 10 percent (see Mitigation Measure 3.8A-6) would reduce PM_{10} emissions to approximately 133.3 ppd. PM_{10} emissions would be reduced to a less than significant level.[2] However, significant levels of NO_X would remain.

Alternative 2A: Wilshire BRT and Exposition BRT (MOS)

Construction for the Wilshire BRT and Exposition BRT MOS Alternative would occur along the Wilshire BRT, as well as the Exposition BRT MOS. This alternative would generate pollutant emissions from the following construction activities: (1) the demolition of existing structures, (2) mobile emissions related to construction worker travel to and from project sites, (3) mobile emissions related to the delivery and hauling of construction supplies and debris to and from project sites, and (5) stationary emissions related to fuel consumption by on-site construction equipment. Construction for the Wilshire BRT and Exposition BRT MOS would occur in several steps, lasting for a total of approximately 48 to 54 months. Construction would begin simultaneously at several locations along the route to accommodate areas requiring lengthy construction times. Construction for the Wilshire BRT and Exposition BRT MOS could be summarized into three categories: site preparation (which includes demolition of structures and excavation of roadway) and construction of routes (roadways, stations, aerial structures, tract installation, and park-and-ride facilities). Table 3.8A-4 shows the estimated worst-case daily construction emissions for this alternative. Daily emissions were derived using the applicable emission factors and formulas found in the *SCAQMD CEQA Handbook*, Appendix to Chapter 9.

---

[2] A three percent soil moisture content was used to calculate PM_{10} concentrations without implementation of mitigation measures. Implementation of Mitigation Measure 3.8A-6 would increase the soil moisture content to approximately 10 percent. Based on the formulas provided in Table 9-9 of the SCAQMD CEQA Air Quality Handbook, Appendix 9 (1993 edition), a soil moisture content of approximately 10 percent would reduce PM_{10} concentrations to approximately 133.3 ppd.

TABLE 3.8A-4 DAILY CONSTRUCTION EMISSIONS (POUNDS PER DAY) EXPOSITION BRT MOS/A/					
Construction Phase	**CO**	**ROG**	**NO_X**	**SO_X**	**PM_{10}**
Site Preparation	252.6	33.3	103.5	3.5	525.0
Construction of Alignments	218.0	22.8	44.8	1.8	4.6
Maximum	252.6	33.3	103.5	3.5	525.0
SCAQMD Threshold	550	75	100	150	150
Potential Threshold Violation?	No	No	Yes	No	Yes
/a/ Calculations assumes that construction for the Wilshire BRT and the Exposition BRT MOS would occur simultaneously.					
Source: Terry A. Hayes Associates, 2000.					

As shown above, CO, ROG and SO_X are not anticipated to exceed the SCAQMD significance thresholds. Additionally, overlapping of construction phases would not increase these three criteria pollutants to a significant level. However, NO_X and PM_{10} emissions would exceed the SCAQMD significance threshold of 100 and 150 ppd, respectively, which would result in a short-term significant impact. Increasing on-site soil moisture content to 10 percent (see Mitigation Measure 3.8A-6) would reduce PM_{10} emissions to 107.8 ppd during site preparation.[3] Thus, PM_{10} emissions would be reduced to a less than significant level. However, NO_X emissions would remain significant.

Alternative 3: Wilshire BRT and Exposition LRT (Full Length)

Construction impacts for this alternative would include those for the Wilshire BRT and the Exposition LRT. The Wilshire BRT impacts are discussed above. The Exposition LRT portion of this alternative would generate pollutant emissions from the following construction activities: (1) the demolition of existing structures, (2) mobile emissions related to construction worker travel to and from project sites, (3) mobile emissions related to the delivery and hauling of construction supplies and debris to and from project sites, and (4) stationary emissions related to fuel consumption by on-site construction equipment. As detailed in the Construction Methods Technical Report prepared for the proposed project, construction would occur in several steps, lasting for a total of approximately 48 to 54 months. Construction would begin simultaneously at several locations along the route to accommodate areas requiring lengthy construction times. Construction for the Exposition LRT could be summarized into three categories: site preparation (which includes demolition and excavation of roadway) and construction of routes (installation of tracks, stations, aerial structures, and park-and-ride facilities). Table 3.8A-5 shows the estimated worst-case daily construction emissions for this alternative. Daily emissions were derived using the applicable emission factors and formulas found in the *SCAQMD CEQA Handbook*, Appendix to Chapter 9.

---

[3] A three percent soil moisture content was used to calculate PM_{10} concentrations without implementation of mitigation measures. Implementation of Mitigation Measure 3.8A-6 would increase the soil moisture content to approximately 10 percent. Based on the formulas provided in Table 9-9 of the SCAQMD CEQA Air Quality Handbook, Appendix 9 (1993 edition), a soil moisture content of approximately 10 percent would reduce PM_{10} concentrations to approximately 107.8 ppd.

TABLE 3.8A-5
DAILY CONSTRUCTION EMISSIONS (POUNDS PER DAY)
EXPOSITION LRT /A/

Construction Phase	CO	ROG	NO_X	SO_X	PM_{10}
Site Preparation	313.8	41.2	127.2	4.3	649.6
Construction of Alignments	164.0	15.9	23.7	1.1	2.0
Maximum	313.8	41.2	127.2	4.3	649.6
SCAQMD Threshold	550	75	100	150	150
Potential Threshold Violation?	No	No	Yes	No	Yes

/a/ Calculations assumes that construction for the Wilshire BRT and the Exposition LRT would occur simultaneously.

Source: Terry A. Hayes Associates, 2000.

As shown above, CO, ROG, and SO_X are not anticipated to exceed the SCAQMD significance thresholds. Additionally, overlapping of construction phases would not increase these three criteria pollutants to a significant level. However, NO_X and PM_{10} emissions would exceed the SCAQMD significance threshold of 100 and 150 ppd, respectively, which would result in a short-term significant impact. A soil moisture content of approximately 10 percent (see Mitigation Measure 3.8A-6) would reduce PM_{10} emissions to 133.3 ppd.[4] Thus, a less than significant level is anticipated. However, significant levels of NO_X would remain.

<u>Alternative 3A: Wilshire BRT and Exposition LRT (MOS)</u>

Construction for the Wilshire BRT and Exposition LRT MOS Alternative would occur along the Wilshire BRT, as well as the Exposition LRT MOS. This alternative would generate pollutant emissions from the following construction activities: (1) the demolition of existing structures, (2) mobile emissions related to construction worker travel to and from project sites, (3) mobile emissions related to the delivery and hauling of construction supplies and debris to and from project sites, and (5) stationary emissions related to fuel consumption by on-site construction equipment. Construction for the Wilshire BRT and Exposition LRT MOS would occur in several steps, lasting for a total of approximately 48 to 54 months. Construction would begin simultaneously at several locations along the route to accommodate areas requiring lengthy construction times. Construction for the Wilshire BRT and Exposition LRT MOS could be summarized into three categories: site preparation (which includes demolition of structures and excavation of roadway) and construction of routes (roadways, stations, aerial structures, tract installation, and park-and-ride facilities). Table 3.8A-6 shows the estimated worst-case daily construction emissions for this alternative. Daily emissions were derived using the applicable emission factors and formulas found in the *SCAQMD CEQA Handbook*, Appendix to Chapter 9.

[4] A three percent soil moisture content was used to calculate PM_{10} concentrations without implementation of mitigation measures. Implementation of Mitigation Measure 3.8A-6 would increase the soil moisture content to approximately 10 percent. Based on the formulas provided in Table 9-9 of the SCAQMD CEQA Air Quality Handbook, Appendix 9 (1993 edition), a soil moisture content of approximately 10 percent would reduce PM_{10} concentrations to approximately 133.3 ppd.

TABLE 3.8A-6 DAILY CONSTRUCTION EMISSIONS (POUNDS PER DAY) EXPOSITION LRT MOS/A/					
Construction Phase	**CO**	**ROG**	**NO_X**	**SO_X**	**PM_{10}**
Site Preparation	252.6	33.3	103.5	3.5	525.0
Construction of Alignments	164.0	15.9	23.7	1.1	1.97
Maximum	252.6	33.3	103.5	3.5	525.0
SCAQMD Threshold	550	75	100	150	150
Potential Threshold Violation?	No	No	Yes	No	Yes
/a/ Calculations assumes that construction for the Wilshire BRT and the Exposition BRT MOS would occur simultaneously.					
Source: Terry A. Hayes Associates, 2000.					

As shown above, CO, ROG, and SO_X are not anticipated to exceed the SCAQMD significance thresholds. Additionally, overlapping of construction phases would not increase these three criteria pollutants to a significant level. However, NO_X and PM_{10} emissions would exceed the SCAQMD significance threshold of100 and 150 ppd, respectively, which would result in a short-term significant impact. A soil moisture content of approximately 10 percent (see Mitigation Measure 3.8A-6) would reduce PM_{10} emissions to 107.8 ppd during site preparation.[5] Thus, PM_{10} emissions would be reduced to a less than significant level. However, NO_X emissions would remain significant.

Maintenance Yard

Construction for the proposed candidate maintenance yards would generate pollutant emissions from all or a combination of the following construction activities: (1) demolition, (2) grading and excavation, (3) construction worker travel to and from project sites, (4) delivery and hauling of construction supplies and debris to and from project sites, and (5) fuel combustion by on-site construction equipment.

Air quality impacts from demolition, grading/excavation, and foundation would occur all candidate sites, with the exception of Alameda and 6th Street. A MTA bus maintenance facility currently exists at Alameda and 6th Street. Additionally, an approximately 2-acre site adjoins the south of the existing facility. Because this site is vacant and the buildings that currently exist in the bus maintenance facility would remain relatively unchanged, no demolition is required for this site. Table XX summarizes the estimated daily emissions associated with each construction phase for each candidate site. Daily emissions were derived using the applicable emission factors and formulas found in the SCAQMD CEQA Handbook, Appendix to Chapter 9.

[5] A three percent soil moisture content was used to calculate PM_{10} concentrations without implementation of mitigation measures. Implementation of Mitigation Measure 3.8A-6 would increase the soil moisture content to approximately 10 percent. Based on the formulas provided in Table 9-9 of the SCAQMD CEQA Air Quality Handbook, Appendix 9 (1993 edition), a soil moisture content of approximately 10 percent would reduce PM_{10} concentrations to approximately 107.8 ppd.

As shown in Table 3.8A-7, construction at each candidate facility is not anticipated to exceed the SCAQMD significance thresholds for the five criteria pollutants. Thus, a less than significant impact is anticipated.

TABLE 3.8A-7
DAILY CONSTRUCTION EMISSIONS (POUNDS PER DAY)
MAINTENANCE YARD

Construction Phase	CO	ROG	NO_X	SO_2	PM_{10}
Chavez and Mission					
Demolition	27	5	45	3	77
Grading/Excavation	34	6	58	5	21
Foundation	65	10	80	6	49
Maximum	*65*	*10*	*80*	*6*	*77*
Alameda and 6th Street					
Grading/Excavation	44	8	74	6	22
Foundation	21	3	24	2	15
Maximum	*44*	*8*	*74*	*6*	*22*
Washington and Alameda Northeast Corner					
Demolition	27	5	42	3	70
Grading/Excavation	28	5	49	4	20
Foundation	39	6	47	4	29
Maximum	*39*	*6*	*49*	*4*	*70*
Washington and Alameda Southeast Corner					
Demolition	26	5	43	3	71
Grading/Excavation	28	5	49	4	20
Foundation	38	6	46	3	28
Maximum	*38*	*6*	*49*	*4*	*71*
Exposition Right-of-Way (Hooper to Central)					
Demolition	25	5	40	3	57
Grading/Excavation	18	3	31	3	18
Foundation	19	3	23	2	14
Maximum	*25*	*5*	*40*	*3*	*57*
South Park Shops (54th and Avalon)					
Demolition	37	7	50	3	104
Grading/Excavation	26	5	45	4	19
Foundation	34	5	41	3	25
Maximum	*37*	*7*	*50*	*4*	*104*
SCAQMD Threshold	**550**	**75**	**100**	**150**	**150**
SOURCE: Terry A. Hayes Associates, 2000.					

Subway Design Option at USC/Exposition Park (for Alternatives 2, 2A, 3, and 3A)

Construction for the Exposition LRT includes an optional subway segment, which would be located between Figueroa Street and Vermont Avenue. Table 3.8A-8 shows the estimated daily emissions if the subway segment is constructed.

TABLE 3.8A-8
DAILY CONSTRUCTION EMISSIONS (POUNDS PER DAY) FOR OPTIONAL SUBWAY DESIGN

Construction Phase	CO	ROG	NO_X	SO_X	PM_{10}
Subway	42.9	6.8	69.0	5.2	4.9
SCAQMD Threshold	550	75	100	150	150
Potential Threshold Violation?	No	No	No	No	No

Source: Terry A. Hayes Associates, 2000.

As shown above, construction for the subway segment would not violate SCAQMD significance thresholds for each of the criteria pollutants. Overlapping of construction phases is not likely to increase criteria pollutants to a significant level. Implementation of mitigation measures would ensure that that air quality impacts would remain less than significant.

3.8A.3 Mitigation Measures

Mitigation Measures 3.8A-1 to 3.8A-4 are recommended to reduce NO_X and PM_{10}, as well as CO, ROG, and SO_X, emissions associated with construction of the proposed project or project alternatives. Mitigation Measures 3.8A-5 to 3.8A-10 primarily pertain to PM_{10} emissions. When possible, emission reduction rates for each mitigation measure are provided.[6]

- *Mitigation Measure 3.8A-1:* Minimize use of on-site diesel construction equipment, particularly unnecessary idling. Construction equipment will be shut off to reduce idling when not in direct use. For each hour an equipment is turned off, CO, ROG, NO_X, SO_X, and PM_{10} emissions would be reduced by approximately 0.68, 0.15, 1.7, 0.143, and 0.14 grams, respectively.

- *Mitigation Measure 3.8A-2:* Where feasible, replace diesel equipment with electrically powered machinery. A diesel equipment emits approximately 5.6 grams of CO daily and approximately 13.9 grams of ROG, SO_X, NO_X, and PM_{10} daily. For each diesel equipment replaced, approximately 5.6 grams of CO and 13.9 grams of ROG, SO_X, NO_X and PM_{10} would be reduced daily.

- *Mitigation Measure 3.8A-3:* Diesel engines, motors, or equipment shall be located as far away as possible from existing residential areas.

- *Mitigation Measure 3.8A-4:* Construction contracts should explicitly stipulate that all diesel power equipment should be properly tuned and maintained.

- *Mitigation Measure 3.8A-5:* Haul trucks shall be staged in non-residential areas away from school buildings and playgrounds. To the extent feasible, haul truck routes shall be planned to avoid residential areas.

---

[6] Emission reduction rates for the mitigation measures are based on the emission reduction efficiences in Chapter 11 and the Appendix to Chapter 9 of the South Coast Air Quality Management District CEQA Air Quality Handbook (1993 edition).

- *Mitigation Measure 3.8A-6:* Site wetting shall occur often enough to maintain a ten percent surface soil moisture content throughout any site grading or excavation activity. All unpaved parking or staging areas shall be watered at least four times daily, and all on-site stockpiles of debris, dirt, or rusty material shall be covered or watered at least twice daily. The emission reduction rate for this measure range from approximately 30 to 79 percent for PM_{10}. Reduction levels for each of the project alternatives were discussed in Section 3.8A.2, above.

- *Mitigation Measure 3.8A-7:* Require all trucks hauling dirt, sand, soil, or other loose substances and building materials to be covered, or to maintain a minimum freeboard of two feet between the top of the load and the top of the truck bed sides. The emission reduction efficiency rate for this mitigation measure is approximately 7 percent for PM_{10}.

- *Mitigation Measure 3.8A-8:* Utilize street sweeping equipment at site access points and all adjacent streets used by haul trucks or vehicles that have been onsite within thirty minutes of visible dirt deposition (track-out debris). The emission reduction rate for this mitigation measure is approximately 25 percent for PM_{10}.

- *Mitigation Measure 3.8A-9:* Maintain a fugitive dust control program consistent with the provisions of SCAQMD Rule 403 for any grading or earthwork activity that may be required.

- *Mitigation Measure 3.8A-10:* Suspend grading operations during first and second stage smog alerts, and during high winds, i.e., greater than 25 miles per hour.

3.8A.4 Cumulative Impacts

Similar to the impacts of the alternatives considered, construction air quality impacts are not expected to be cumulatively considerable for PM_{10}. However, significant levels of NO_X are anticipated under Alternatives 2, 2A, 3, and 3A. Thus, these alternatives would contribute to cumulative emissions of NO_X. These cumulative impacts for NO_X would be short-term due to the temporary nature of construction.

3.8B Air Quality Operations

3.8B.1 Introduction

This section discusses air quality impacts that would occur during the operational phase of the proposed project or project alternatives.

3.8B.2 Affected Environment

Regulatory Setting

Air quality in the United States is governed by the Federal Clean Air Act (CAA) and is administered by the United States Environmental Protection Agency (USEPA). In addition to being subject to the requirements of the CAA, air quality in California is also governed by the more stringent regulations under the California Clean Air Act (CCAA).

The CCAA of 1988 requires all air districts in the State to endeavor to achieve and maintain State Ambient Air Quality Standards. The CCAA is administered statewide by the California Air Resources Board (CARB). The State of California has also established ambient air quality standards, known as the California Ambient Air Quality Standard (CAAQS). These standards are generally more stringent than the corresponding federal standards and incorporate additional standards for sulfates, hydrogen sulfates, hydrogen sulfide, vinyl chloride and visibility reducing particles. California has established CARB to regulate mobile air pollution sources (such as motor vehicles). CARB also oversees the functions of local air pollution control districts and air quality management districts, which in turn administers air quality activities at the regional and county level. The CCAA is administered by CARB at the state level and by the Air Quality Management Districts at the regional level.

U.S. Environmental Protection Agency

USEPA is responsible for establishing the National Ambient Air Quality Standards (NAAQS) and enforcing the Clean Air Act. It also regulates emission sources that are under the exclusive authority of the federal government, such as aircraft, ships, and certain types of locomotives. The USEPA has jurisdiction over emission sources outside state waters (e.g., beyond the outer continental shelf) and establishes various emission standards, including those for vehicles sold in states other than California. Automobiles sold in California must meet the stricter emission standards established by CARB.

California Air Resources Board

CARB, which became part of the California Environmental Protection Agency (CalEPA) in 1991, is responsible for ensuring implementation of the California Clean Air Act, meeting state requirements of the federal Clean Air Act, and establishing state ambient air quality standards. It is also responsible for setting emission standards for vehicles sold in California and for other emission sources, such as consumer products and certain off-road equipment. CARB also established passenger vehicle fuel specifications, which became effective in March 1996.

Non-Attainment and State Implementation Plans

CARB designates an area as non-attainment for a pollutant if air quality data show that a State standard for a pollutant was violated at least once during the previous three calendar years. Exceedances that are affected by highly irregular or infrequent events are not considered violations of a State standard, and are not used as a basis for designating areas as non-attainment.

On the basis of regional monitoring data, the Los Angeles County portion of the South Coast Air Basin has been designated as a non-attainment area for ozone, carbon monoxide, and total suspended particulates (PM_{10}). The air basin is designated as an attainment area for nitrogen oxide, sulfur dioxide, sulfates, and lead (see Figure 3.8B-1).[1]

Federal clean air laws require areas with unhealthy levels of ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, and inhaleable particulate matter to develop plans, known as State Implementation Plans (SIPs), describing how they would attain national ambient air quality standards (NAAQS). The 1992 amendments to the federal Clean Air Act set new deadlines for attainment based on the severity of the pollution problem and launched a comprehensive planning process for attaining the NAAQS.

SIPs are not single documents; rather, they are a compilation of new and previously submitted plans, programs (such as monitoring, modeling, permitting, etc.), district rules, state regulations, and federal controls. Many of California's SIPs rely on the same core set of control strategies, including emission standards for cars and heavy trucks, fuel regulations, and limits on emissions from consumer products. State law makes CARB the lead agency for all purposes related to the SIP. Local air districts and other agencies, such as the Bureau of Automotive Repair, prepare SIP elements and submit them to CARB for review and approval. CARB forwards SIP revisions to USEPA for approval and publication in the Federal Register. The Code of Federal Regulations (CFR) Title 40, Chapter 1, Part 52, Subpart F, Section 52.220 lists all of the items that are included in the California SIP. Many additional California submittals are pending USEPA approval.

South Coast Air Quality Management District

In order to coordinate air quality planning efforts throughout southern California, the South Coast Air Quality Management District (SCAQMD) was created by the 1977 Lewis Air Quality Management Act, which merged four county air pollution control agencies into one regional district to better address the issue of improving air quality in Southern California. Under the act, renamed the Lewis-Presley Air Quality Management Act in 1988, the SCAQMD is the agency principally responsible for comprehensive air pollution control in the Basin. Specifically, the SCAQMD is responsible for monitoring air quality and planning, implementing, and enforcing programs designed to attain and maintain state and federal ambient air quality standards in the district. Programs developed include air quality rules and regulations that regulate stationary source emissions, including area sources and point sources and certain mobile source emissions. The SCAQMD is also responsible for establishing permitting requirements for stationary sources and ensuring that new, modified, or relocated stationary sources do not create net emissions increases and, therefore, is

1 California Air Resources Board: Proposed Amendments to the Designation Criteria and Amendments to the Area Designations for State Ambient Air Quality Standards and Proposed Maps of the Area Designations for the State and National Ambient Air Quality Standards, September 2000.

Figure 3.08B-1: Carbon Monoxide, Ozone, and Particulate Matter Levels consistent with the region's air quality goals. The SCAQMD enforces air quality rules and regulations through a variety of means, including inspections, educational or training programs, or fines, when necessary.

The SCAQMD has jurisdiction over a 10,743 square mile area, commonly referred to as the South Coast Air Basin (SCAB). This area includes all of Orange County, Los Angeles County, except for the Antelope Valley, the non-desert portion of western San Bernardino County, and the western and Coachella Valley portions of Riverside County. The SCAB is bounded by the Pacific Ocean to the west; by the San Gabriel, San Bernardino, and San Jacinto mountains to the north and the east; and by the San Diego County line to the south (see Figure 3.8B-2).

Air Quality Management Plan

Within the project area, the SCAQMD and the Southern California Association of Governments (SCAG) have responsibility for preparing the Air Quality Management Plan (AQMP), which address federal and state Clean Air Act requirements. The AQMP details goals, policies, and programs for improving air quality and establishes thresholds for daily operation emissions. Environmental review of individual projects within the region must demonstrate that daily construction and operational emissions thresholds, as established by the SCAQMD, would not be exceeded, nor would the number or severity of existing air quality violations.

In August of 1996, the SCAQMD submitted its AQMP to CARB for inclusion in the SIP. As mentioned earlier, the AQMP also meets CCAA requirements. The AQMP addressed CCAA requirements, which are intended to bring the SCAQMD into compliance with federal and state air quality standards. The AQMP focused on ozone and carbon monoxide emissions, which would be reduced through public education, vehicle and fuel management, transportation controls, indirect source controls, and stationary source controls programs.

The 1997 Draft AQMP has been prepared to reflect the requirements of the 1990 Clean Air Act Amendments and is consistent with the approaches taken in the 1994 AQMP. The Plan is expected to replace, in part or in whole, many of the proposed measures set forth in the SIP and anticipates the attainment of all pollutants by 2010.

The overall control strategy of the 1997 AQMP was to meet applicable state and federal requirements and to demonstrate attainment with ambient air quality standards. The 1997 AQMP is the first plan required by the federal law to demonstrate attainment of the federal PM_{10} ambient air quality standards, and therefore, places a greater focus on PM_{10}.

National and State Ambient Air Quality Standards

As required by the Clean Air Act, National Ambient Air Quality Standards (NAAQS) have been established for six major air pollutants: carbon monoxide, nitrogen oxides, ozone, particulate matter smaller than 10 microns (PM_{10}), sulfur oxides, and lead. The State of California has also established ambient air quality standards-known as the California Ambient Air Quality Standards (CAAQS), which are generally more stringent than the federal standards and incorporate additional standards for sulfates, hydrogen sulfide, vinyl chloride and visibility reducing particles. Because the CAAQS are more stringent than the NAAQS, they are used as the comparative standard in the analysis contained in this report.

Figure 3.08B-2: South Coast Air Basin

Both State and Federal standards are summarized in Table 3.8B-1. The "primary" standards have been established to protect the public health. The "secondary" standards are intended to protect the nation's welfare and account for air pollutant effects on soil, water, visibility, materials, vegetation and other aspects of the general welfare.

TABLE 3.8B-1
FEDERAL AND CALIFORNIA AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Period	California Standard[1]	Federal Standards[2]	
		Concentration[3]	Primary[3, 4]	Secondary[3, 5]
Ozone (O_3)	1 hour	0.09 ppm (180 μg/m^3)	0.12 ppm (235 μg/m^3)[6]	Same as Primary Standard
	8 hour	--	0.08 ppm (157 μg/m^3)	
Respirable Particulate Matter (PM_{10})	Annual Geometric Mean	30 μg/m^3	--	Same as Primary Standard
	24 hour	50 μg/m^3	150 μg/m^3	
	Annual Arithmetic Mean	--	50 μg/m^3	
Fine Particulate Matter ($PM_{2.5}$)	24 hour	No Separate Standard	65 μg/m^3	Same as Primary Standard
	Annual Arithmetic Mean		15 μg/m^3	
Carbon Monoxide (CO)	8 hour	9.0 (10 mg/m3)	9.0 (10 mg/m3)	None
	1 hour	20 ppm (23 mg/m3)	35 ppm (40 mg/m3)	
	8 hour (Lake Tahoe)	6 ppm (7 mg/m3)	--	
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	--	0.053 ppm (100 μg/m^3)	Same as Primary Standard
	1 hour	0.25 ppm (470 μg/m^3)	--	
Sulfur dioxide (SO_2)	Annual Arithmetic Mean	--	0.030 ppm (80 μg/m^3)	--
	24 hour	0.04 ppm (105 μg/m^3)	0.14 ppm (365 μg/m^3)	--
	3 hour	--	--	0.5 ppm (1300 μg/m^3)
	1 hour	0.25 ppm (655 μg/m^3)	--	--
Lead	30 days average	1.5 μg/m^3	--	--
	Calendar Quarter	--	1.5 μg/m^3	Same as Primary Standard
Visibility Reducing Particulates	8 hour (10 am to 6 pm, PST)	In sufficient amount to produce an extinction coefficient of 0.23 per kilometer—visibility of ten miles or more (0.07-30 miles or more for Lake Tahoe) due to particles when the relative humidity is less than 70 percent.	No Federal Standards	
Sulfates	24 hour	25 μg/m^3		
Hydrogen Sulfide	1 hour	0.03 ppm (42 μg/m^3)		

TABLE 3.8B-1
FEDERAL AND CALIFORNIA AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Period	California Standard[1]	Federal Standards[2]	
		Concentration[3]	Primary[3, 4]	Secondary[3, 5]

1. California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1 and 24 hour), Nitrogen dioxide suspended particulate matter—PM_{10}, and visibility-reducing particles, are values that are not to be exceeded. All others are not to be equaled or exceeded.
2. National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest eight-hour concentration in a year, averaged over three years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when 99 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard.
3. Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 2°C and a reference pressure of 760 mm of mercury. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 mm of mercury (1,013.2 millibar); ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.
4. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.
5. National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.
6. New federal one-hour ozone and fine particulate matter standards were promulgated by U.S. EPA on July 18,1997. The federal one-hour ozone standard continues to apply in areas that violated the standard.

Source: California Air Resources Board, Federal and State Air Quality Standards 1999 (1/25/99)

Pollutants and Effects

Air quality studies focus on the following five criteria pollutants: ozone (O3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and respirable particulate matter (PM_{10}).

Ozone. Ozone (O_3) is a colorless gas and is the chief component of urban smog. Ozone impacts lung function by irritating and damaging the respiratory system. In addition, ozone causes damage to vegetation, buildings, rubber, and some plastics (California Air Resources Board Almanac, 1999). Ozone is one of a number of substances called photochemical oxidants that are formed when reactive organic compounds (ROC) and nitrogen oxides (precursor emissions), both byproducts of the internal combustion engine, react in the presence of ultraviolet sunlight. Ozone is present in relatively high concentrations within the Basin, and the damaging effects of photochemical smog are generally related to the concentrations of ozone. (SCAQMD, 1993). Meteorology and terrain play major roles in ozone formation. Generally, low wind speeds or stagnant air coupled with warm temperatures and cloudless skies provide for the optimum conditions.

Carbon Monoxide. Carbon monoxide (CO) is a gas that, in the human body, interferes with the transfer of oxygen to the blood. It can cause dizziness and fatigue, and can impair central nervous system functions. CO is a product of incomplete combustion emitted, along with carbon dioxide, by motor vehicles, power plants, refineries, industrial boilers, ships, aircraft, and trains. In urban areas, CO is emitted primarily by automobiles, trucks, and motorcycles. CO is a nonreactive air pollutant that dissipates relatively quickly, so ambient carbon monoxide concentrations generally follow the spatial and temporal distributions of vehicular traffic. CO concentrations are influenced by local meteorological conditions, primarily wind speed, topography, and atmospheric stability. When surface-based temperature inversions are combined with calm atmospheric conditions, a typical situation at dusk in urban areas between November and February, CO from motor vehicle exhaust can become locally concentrated. The highest CO concentrations measured in SCAB are typically recorded during the winter.

Nitrogen Dioxide. Nitrogen dioxide (NO_2) is a byproduct of fuel combustion. The principal form of nitrogen oxide produced by combustion is nitric oxide (NO), but NO reacts quickly to form NO_2, creating the mixture of NO and NO_2 commonly called NO_x. Nitrogen dioxide acts as an acute irritant and, in equal concentrations is more injurious than NO at atmospheric concentrations, however, NO_2 is only potentially irritating. There is some indication of a relationship between NO_2 and chronic pulmonary fibrosis. Some increase in bronchitis in children (two to three years old) has also been observed at concentrations below 0.3 parts per million (ppm). Nitrogen dioxide absorbs blue light; the result is a brownish-red cast to the atmosphere and reduced visibility. NO_2 also contributes to the formation of PM_{10} (SCAQMD, 1993).

Sulfur Oxides. Sulfur oxides, primarily sulfur dioxide (SO_2), are a product of combustion of high-sulfur fuels, such as many grades of coal and oil. In recent years, restrictions on the use of high-sulfur fuels and other air pollution control measures have substantially reduced ambient concentrations of SO_2 throughout the U.S. SO_2 is a human respiratory irritant. It also combines with moisture in the atmosphere to form sulfuric acid, which, in turn, damages vegetation and slowly erodes the exterior facades of buildings and other structures in urban areas. SO_2 concentrations have been reduced by the increasingly stringent controls placed on stationary source emissions of SO_2 and limits on the sulfur content of fuels. The SO_2 concentrations have been reduced to levels well below state and national standards, but further reductions in emissions are needed to attain compliance with standards for sulfates and PM_{10}, of which SO_2 is a contributor.

Suspended Particulate Matter. Suspended, or respirable, particulate matter (PM_{10}) consists of suspended particles less than 10 microns in diameter. Particulates in this size category can be inhaled, irritating the human respiratory tract and aggravating pre-existing respiratory disease. Very small particles of substances such as lead, sulfates, and nitrates can cause lung damage directly, can be absorbed into the blood stream and cause damage elsewhere in the body, and can transport absorbed gases, such as chlorides or ammonium, into the lungs and cause injury. Particulates also damage and discolor surfaces on which they settle, and reduce regional visibility.

Particulates in the atmosphere result from natural sources, such as wind erosion and ocean spray, and from human activities. Man-made sources include many types of dust- and fume-producing industrial and agricultural operations; fuel combustion and vehicle travel; grading, excavating, demolition, and blasting from construction; and atmospheric chemical and photochemical reactions. Motor vehicle traffic is the major source of PM_{10}. In urban areas, PM_{10} concentrations generally are higher in winter when more fuel is burned and meteorological conditions favor the concentration of primary air pollutants.

Regional Setting

The proposed project or project alternatives are located within the Los Angeles County portion of the SCAB. Ambient pollution concentrations recorded in the Los Angeles County are among the highest in the four counties comprising the Basin. The SCAB is an area of high air pollution potential due to its climate and topography. The Basin experiences warm summers, mild winters, infrequent rainfalls, light winds, and moderate humidity. In addition, the mountains and hills within the area contribute to the variation of rainfall, temperature, and winds throughout the region. The region experiences frequent temperature inversions-temperature typically decreases with height; however, under inversion conditions, temperature increases as altitude increases and prevents air close to the ground from mixing with the air above it. As a result, air pollutants are trapped near the ground. During the summer, air quality problems are created due to the interaction between the ocean surface and lower layer of the atmosphere, which creates a moist marine layer. An upper layer of warm air mass forms over the cool marine layer, preventing air pollutants from dispersing upward.

In addition, hydrocarbons and nitrogen dioxide react under strong sunlight, creating pollution, commonly referred to as "smog." Light, daytime winds, predominantly from the west, further aggravate the condition by driving the air pollutants inland, toward the mountains.

During the fall and winter, air quality problems are created due to carbon monoxide and nitrogen dioxide emissions. High nitrogen dioxide (NO_2) levels usually occur during autumn or winter, on days with summer-like conditions. Since CO is produced almost entirely from automobiles, the highest CO concentrations in the SCAB are associated with heavy traffic.

Local Setting

The SCAQMD monitors air quality conditions at 37 locations throughout the SCAB. The Mid-City/Westside Transit Corridor is within the Northwest and Central Los Angeles Source Receptor Areas (see Figure 3.8B-3). The West Los Angeles-VA Hospital monitoring station serves the Northwest Los Angeles Source Receptor Area, and the Los Angeles-North Main Street monitoring station serves the Central Los Angeles Source Receptor Area. Data from the West Los Angeles-VA Hospital and Los Angeles-North Main Street monitoring stations were used to characterize existing conditions in the vicinity of the proposed project, and establish a baseline for estimating future conditions both with and without the proposed project. The pollutants SO_2 and PM_{10} are not monitored at the West Los Angeles monitoring station. The Los Angeles monitoring station will be used to characterize these two pollutants. A summary of the data recorded at these stations is presented in Table 3.8B-2.

FIGURE 3.08B-3: AIR MONITORING AREAS

TABLE 3.8B-2
AIR QUALITY SUMMARY FOR STUDY AREA MONITORING STATIONS, 1997-1999

Air Pollutant	Standard Exceedance	West Los Angeles-VA Hospital			Los Angeles-North Main Street		
		1997	**1998**	**1999**	**1997**	**1998**	**1999**
Carbon Monoxide (CO)	Maximum 8-hr concentration (ppm)	4.24	4.46	3.59	7.80	6.18	6.37
	Days > 9.5 ppm (federal 8-hr. standard)	0	0	0	0	0	0
	Days > 9 ppm (state 8-hr standard)	0	0	0	0	0	0
Ozone (O_3)	Maximum 1-hr Concentration (ppm)	0.111	0.127	0.117	0.120	0.148	0.128
	Maximum 8-hr Concentration (ppm)	0.084	0.079	0.074	0.092	0.111	0.108
	Days > 0.12 ppm (federal 1-hr standard)	0	1	0	0	5	1
	Days > 0.08 ppm (federal 8-hr standard)	0	0	0	3	9	2
	Days > 0.09 ppm (state 1-hr standard)	6	7	4	6	17	13
Nitrogen Dioxide (NO_2)	Maximum 1-hr Concentration (ppm)	0.138	0.130	0.133	0.198	0.170	0.212
	Days > 0.09 ppm (state 1-hr standard)	0	0	0	0	0	0
Sulfur Dioxide (SO_2)	Maximum 24-hr Concentration (ppm)	N/A	N/A	N/A	0.011	0.006	0.010
	Days > 0.14 ppm (federal 24-hr standard)				0	0	0
	Days > 0.05 ppm (state 24-hr standard)				0	0	0
Suspended Particulates (PM_{10})	Maximum 24-hr concentration ($\mu g/m^3$)	N/A	N/A	N/A	102	80	88
	Calculated > 150 $\mu g/m^3$ (federal 24-hr standard)				90	66	0
	Calculated > 50 $\mu g/m^3$ (state 24-hr standard)				0	0	114

N/A = pollutant not monitored.
ppm = parts per million
$\mu g/m^3$ = micrograms per cubic meter.
Source: California Air Quality Data Summaries 1997-1999, California Air Resources Board.

With the exception of O_3, no pollutants monitored at the West Los Angeles-VA Hospital monitoring station exceed the Federal and State Standards. At the Los Angeles-North Main Street monitoring station, O_3 and PM_{10} exceeded the Federal and State Standards at least once between 1997 and 1999. However, CO, NO_2, and SO_2 did not exceed the Federal or State Standards.

Background Carbon Monoxide Concentrations

Carbon monoxide concentrations are typically used as the sole indicator of conformity with the CAAS because 1) CO levels are directly related to vehicular traffic volumes, the main source of air pollutants, and 2) localized CO concentrations and characteristics can be modeled using USEPA and SCAQMD methods. In other words, the operational air quality impacts associated with a project are generally best reflected through the estimated changes in related CO concentrations. The background, or ambient, CO level is typically defined as the average of the second-highest readings over the last three year period.[2]

A review of the data from the West Los Angeles-VA Hospital monitoring station during the 1997 through 1999 period indicates that the average eight-hour background CO concentration was 3.9 parts per million (ppm). An ambient eight-hour CO concentration based on the data recorded from the Los Angeles-North Main Street monitoring station is 5.7 ppm. Assuming a typical persistence

[2] Caltrans: Air Quality Technical Analysis Notes, June 1988.

factor[3] of 0.7, the estimated one-hour background concentration would be 5.6 ppm at the West Los Angeles-VA Hospital monitoring station and 8.1 ppm at the Los Angeles-Main Street monitoring station. The ambient CO concentrations at each station do not exceed the State and Federal standards.

Carbon Monoxide Concentrations at Sensitive Receptor Locations

Some land uses are considered more sensitive to changes in air quality than others, depending on the types of population groups and the activities involved. The CARB has identified the following people as the most likely to be affected by air pollution: children under 14 years of age, the elderly over 65 years of age, athletes, and people with cardiovascular and chronic respiratory diseases. These groups are classified as sensitive receptors. Locations that may contain a high concentration of these sensitive population groups include hospitals, daycare facilities, elder care facilities, elementary schools, and parks. These land uses are located within the corridor area.

There is a direct relationship between traffic/circulation congestion and CO impacts, since exhaust fumes from vehicular traffic is the primary source of CO. Carbon monoxide is a localized gas that dissipates very quickly under normal meteorological conditions. Therefore, CO concentrations decrease substantially as distance from the source (intersection) increases. The highest CO concentrations are typically found along sidewalk locations directly adjacent to congested roadway intersections.

To provide a worst-case simulation of CO concentrations within the area that may be affected by the proposed project or project alternatives, CO concentrations at sidewalks adjacent to the most congested 31 of the 158 study intersections were modeled. The 31 intersections were selected to represent worst-case conditions because these intersections were designated by the project traffic consultant as being significantly impacted by traffic and would have a level of service (LOS) of F in at least one of the project alternatives. At each intersection, traffic related CO contributions were added to the background conditions discussed above. Traffic contributions were estimated using the CAL3QHC dispersion model, which utilizes traffic volume inputs and EMFAC7F emissions factors. Table 3.8B-3 shows existing CO concentrations at the 31 study intersections evaluated.

TABLE 3.8B-3
EXISTING CARBON MONOXIDE (CO) CONCENTRATIONS (PARTS PER MILLION)

Intersection	1-Hour CO Concentration	Exceed State 1-Hour Standard (20 ppm)	8-Hour CO Concentration	Exceed State 8-Hour Standard (9 ppm)
Lincoln/Olympic	18.3	No	12.8	Yes
20th/Colorado	18.2	No	12.7	Yes
San Vicente/Wilshire	20.0	No	14.0	Yes
Sawtelle/405	19.8	No	13.9	Yes
Sawtelle/Pico	19.9	No	13.9	Yes
Sawtelle/National	14.9	No	10.4	Yes
Sawtelle/Palms	15.3	No	10.7	Yes

3 Persistence factor is the ratio between the one-hour and one-hour second annual maximum CO concentrations measured at a continuous air monitoring station. A persistence factor of 0.7 is typically used in urban areas.

TABLE 3.8B-3
EXISTING CARBON MONOXIDE (CO) CONCENTRATIONS (PARTS PER MILLION)

Intersection	1-Hour CO Concentration	Exceed State 1-Hour Standard (20 ppm)	8-Hour CO Concentration	Exceed State 8-Hour Standard (9 ppm)
Sawtelle/Venice	20.7	Yes	14.5	Yes
Sepulveda/Wilshire	20.0	No	14.0	Yes
Sepulveda/Pico	18.3	No	12.8	Yes
Sepulveda/National	20.2	Yes	14.1	Yes
Sepulveda/Palms	16.9	No	11.8	Yes
Sepulveda/Venice	21.4	Yes	15.0	Yes
Veteran/Wilshire	21.3	Yes	14.9	Yes
Westwood/Santa Monica	14.9	No	10.4	Yes
Glendon/Wilshire	25.2	Yes	17.6	Yes
Ave of Stars/Santa Monica	21.2	Yes	14.8	Yes
Santa Monica/Wilshire	23.5	Yes	16.5	Yes
S Santa Monica/Wilshire	15.3	No	10.7	Yes
Beverly/Wilshire	17.5	No	12.3	Yes
Highland/Olympic	15.1	No	10.6	Yes
Washington/Washington	15.1	No	10.6	Yes
Motor/Venice	19.3	No	13.5	Yes
Culver/Main	13.3	No	9.3	Yes
Culver/Venice	21.2	Yes	14.8	Yes
Robertson/Venice	18.4	No	12.9	Yes
National/Venice	19.3	No	13.5	Yes
La Cienega/Jefferson	18	No	12.6	Yes
La Brea/Exposition	13.7	No	9.6	Yes
Arlington/Exposition	16.7	No	11.7	Yes
Figueroa/Adams	15.3	No	10.7	Yes
Girard/Venice	13.7	No	9.6	Yes

Source: Terry A. Hayes Associates, CAL3QHC output, 2000.

As shown in Table 3.8B-3, 8 of the 31 study intersections exceed the State one-hour CO concentration standard of 20 ppm; however, all 31 study intersections currently exceed the State eight-hour CO concentration standard of 9 ppm.

Future Baseline Air Quality

CARB, as part of their planning process to meet the requirements of the National and State Clean Air Acts, estimates future mobile emissions for each air basin within the State. Table 3.8B-4 illustrates the South Coast Air Basin mobile emissions estimate for the years 2000 and 2020. As can be seen, SO_X and PM_{10} emissions are expected to increase by 16 and 22 percent, respectively, as a result of an increase in vehicle miles traveled (VMT), which results in mostly brake and tire-wear. Although vehicle miles traveled within the County is expected to increase by approximately 33 percent, CO, NO_X, and ROG emissions are expected to decrease by 47 to 80 percent due to cleaner vehicle fleet. The cleaner fleet is a result of reduced emissions from new vehicles and removal of older higher emission vehicles over the 20-year period.

TABLE 3.8B-4
CRITERIA POLLUTANT EMISSIONS REDUCTION /A/

Pollutant	Year 2000		Year 2020		Percent Change
	Tons/day	Tons/year /b/	Tons/day	Tons/year /b/	
Reactive Organic Gases (ROG)	349.2	109,998	69.8	21,987	-80%
CO	3,162.1	996,061.5	1,296.2	408,303	-59%
NO_X	331.3	104,359.5	174.9	55,093.5	-47%
PM_{10}	8.2	2,583	10.0	3,150	22%
SO_X	2.9	913.5	3.5	1,102.5	21%
Daily VMT (millions)	280.3	88,309.9	373.8	117,740.1	33%

/a/ Emissions are calculated for light duty automobiles and light duty trucks.
/b/ Tons/year is calculated based on a trip factor of 315 days.
/c/ VMT = vehicle miles traveled.
Source: California Air Resources Board, Burden 7G output – South Coast Air Basin, 2000.

As shown in Table 3.8B-4, carbon monoxide accounts for the vast majority of mobile emissions. The anticipated reduction in CO emissions would have a corresponding effect on ambient air quality levels in the SCAB. Because the CARB mobile emissions estimates take into account both the growth in vehicle miles traveled as well as improved emission rates, the CO reductions can be directly applied to ambient background CO concentrations, consistent with the USEPA guidance, to provide a future year estimate of background CO levels.

As previously indicated, the average one- and eight-hour background CO concentrations were 8.1 and 5.7 ppm, respectively, at the Los Angeles-North Main Street monitoring station.[4] Year 2020 one-hour and eight-hour ambient CO concentrations would be reduced to 3.7 ppm and 2.6 ppm, respectively. This anticipated downward trend in CO concentrations is consistent with a continuing decline in historical CO measurements registered at the Los Angeles-North Main Street monitoring stations (See Table 3.8B-2).

3.8B.3 Impact Assessment and Mitigation Measures

Standards of Significance

The Code of Federal Regulations (CFR) 40 Part 51 establishes conformity measures for the Federal or State Implementation Plan. Under CFR 40 Part 51, should criteria pollutants emitted by the proposed project or project alternatives exceed the amounts listed in Table 3.8B-5 when compared to future no action conditions, a conformity analysis would be required. The conformity criteria only pertains to the operation phase of the proposed project. No conformity criteria are associated with the construction phase.

---

[4] As discussed earlier, ambient CO concentration at the Los Angeles-North Main Street monitoring station is higher than the ambient CO concentrations at the West Los Angeles-VA Hospital monitoring station. Therefore, the ambient CO concentration for the Los Angeles- North Main Street monitoring station was utilized to calculate year 2020 ambient CO concentrations.

TABLE 3.8B-5 CFR 40 PART 51 – CONFORMITY CRITERIA	
Pollutants	**Tons per Year (increase over no project conditions)**
CO	100
NO_X	10
ROG	10
PM_{10}	70
Source: United States Environmental Protection Agency, CFR 40 Part 51, 2000.	

The proposed project would have a significant impact if criteria pollutant concentrations exceed the amounts listed in Table 3.8B-5 when compared to the No Action Alternative. The proposed project or project alternatives would also result in a significant impact if the proposed project or project alternatives would cause any criteria pollutant concentration to exceed the CAAQS at any sensitive receptor location.

The proposed project or project alternatives do not contain lead, hydrogen sulfide, or sulfate emission sources. Therefore, emissions and concentrations related to these pollutants will not be analyzed in this report.

Methodology for Impact Evaluation

The following calculation methods and estimation models were utilized in ascertaining air quality impacts: the CARB Motor Vehicle Emission Inventory 7G (MVEI7G) emissions model, the Caltrans EMFAC emissions factor model, the USEPA CAL3QHC dispersion model software, and the USEPA Industrial Source Complex-Short Term Model (ISCST3) air dispersion model. In addition, the FTA Office of Planning Section 5309 New Starts Criteria was used to calculate criteria pollutant/precursor emissions for each alternative being considered. This air quality analysis is consistent with procedures described in the SCAQMD CEQA Handbook (1993 edition).

Impacts

<u>No Action Alternative (Baseline)</u>

Regional Emissions. There is a direct relationship between vehicle miles traveled (VMT) and air pollution. In urbanized regions, such as the Los Angeles Metropolitan area, mobile emissions are the primary source of air pollution. Transportation projects that significantly increase or decrease regional VMT will also significantly degrade or improve regional air quality.

Criteria pollutant emissions for the No Action Alternative are shown in Table 3.8B-6. The pollutant emissions for the No Action Alternative will be compared to the TSM Alternative and build alternatives in subsequent sections. The regional VMT was estimated using the Los Angeles County Metropolitan Transit Authority (LACMTA) transportation model.

TABLE 3.8B-6
CRITERIA POLLUTANT EMISSIONS FOR NO PROJECT ALTERNATIVE

Vehicular Class	Annual VMT (millions)	Criteria Pollutant Emissions (tons per year)			
		CO	NO_X	ROG	PM_{10}
Passenger Vehicle (Light duty Auto/Light duty trucks)	141,667.0	491,907	70,272	26,547	3,123
Bus/CNG	235.5	319	1,545	431	5
Commuter Rail/Diesel	4.9	40	121	1,090	27
Total	141,907.4	492,266	71,938	28,068	3,155
VMT = vehicle miles traveled.					
Source: Terry A. Hayes Associates, 2000.					

CO Hotspot Analysis. Carbon monoxide concentrations at 31 study intersections were calculated using the USEPA CAL3QHC micro scale dispersion model. CO concentrations at each study intersection include future ambient one-hour and eight-hour CO concentration of 3.7 and 2.6 ppm, respectively.

Table 3.8B-7 identifies the one- and eight-hour CO concentrations at the 21 study intersections under the No Action Alternative. As indicated in Table 3.8B-7, future No Action CO concentrations would range from 5.7 to 9.9 ppm for one-hour concentrations and from 4.0 to 6.9 for eight-hour concentrations. CO emitted at the 31 study intersections would not exceed the State one- and eight-hour CO standard of 20 ppm and 9 ppm, respectively. No impacts would occur.

TABLE 3.8B-7
2020 NO PROJECT CARBON MONOXIDE (CO) CONCENTRATIONS (PARTS PER MILLION)

Intersection	1-Hour CO Concentration	Exceed State 1-Hour Standard (20 ppm)?	8-Hour CO Concentration	Exceed State 8-Hour Standard (9 ppm)?
Lincoln/Olympic	7.3	No	5.1	No
20th/Colorado	7.4	No	5.2	No
San Vicente/Wilshire	8.1	No	5.7	No
Sawtelle/405	8.4	No	5.9	No
Sawtelle/Pico	7.9	No	5.5	No
Sawtelle/National	6.6	No	4.6	No
Sawtelle/Palms	6.7	No	4.7	No
Sawtelle/Venice	8.7	No	6.1	No
Sepulveda/Wilshire	8.3	No	5.8	No
Sepulveda/Pico	7.4	No	5.2	No
Sepulveda/National	8.3	No	5.8	No
Sepulveda/Palms	8.0	No	5.6	No
Sepulveda/Venice	8.8	No	6.2	No
Veteran/Wilshire	8.7	No	6.1	No
Westwood/Santa Monica	6.2	No	4.3	No
Glendon/Wilshire	9.9	No	6.9	No
Ave of Stars/Santa Monica	8.6	No	6.0	No
Santa Monica/Wilshire	9.3	No	6.5	No
S Santa Monica/Wilshire	6.7	No	4.7	No
Beverly/Wilshire	8.0	No	5.6	No
Highland/Olympic	6.2	No	4.3	No

TABLE 3.8B-7 2020 NO PROJECT CARBON MONOXIDE (CO) CONCENTRATIONS (PARTS PER MILLION)				
Intersection	**1-Hour CO Concentration**	**Exceed State 1-Hour Standard (20 ppm)?**	**8-Hour CO Concentration**	**Exceed State 8-Hour Standard (9 ppm)?**
Washington/Washington	7.2	No	5.0	No
Motor/Venice	7.8	No	5.5	No
Culver/Main	5.7	No	4.0	No
Culver/Venice	8.9	No	6.2	No
Robertson/Venice	7.9	No	5.5	No
National/Venice	7.7	No	5.4	No
La Cienega/Jefferson	8.4	No	5.9	No
La Brea/Exposition	6.7	No	4.7	No
Arlington/Exposition	6.7	No	4.7	No
Figueroa/Adams	6.8	No	4.8	No
Girard/Venice	6.0	No	4.2	No
Source: Terry A. Hayes Associates, CAL3QHC output, 2000.				

Transportation System Management (TSM) Alternative

Regional Emissions. Criteria pollutant emissions for the TSM Alternative are shown in Table 3.8B-8. The regional VMT for the TSM Alternative was estimated using the Los Angeles County Metropolitan Transit Authority (LACMTA) transportation model.

TABLE 3.8B-8 ESTIMATED CHANGE IN CRITERIA POLLUTANT EMISSIONS FOR TSM ALTERNATIVE					
	Annual VMT	**Criteria Pollutant Emissions (tons per year)**			
Vehicular Class	**(millions)**	**CO**	**NO_X**	**ROG**	**PM_{10}**
Passenger Vehicle (Light duty Auto/Light duty trucks)	141,664.5	491,899	70,271	26,547	3,123
Bus/CNG	235.6	320	1,546	431	5
Commuter Rail/Diesel	4.9	41	122	1,095	28
TSM Total	141,905.0	492,260	71,939	28,073	3,156
TSM vs. No Action	-2.8 (-0.002% change)	-6 (-0.001% change)	1 (0.001% change)	5 (0.02% change)	1 (0.03% change)
VMT = vehicle miles traveled.					
Source: Terry A. Hayes Associates, 2000.					

As indicated in Table 3.8B-8, annual VMT is expected to decrease by approximately 2.8 million miles, or 0.002 percent, annually when compared to the No Action Alternative. In addition, CO concentrations are anticipated to decrease by approximately 0.001 percent, when compared to the No Action Alternative. NO_X, ROG and PM_{10} emissions are anticipated to increase by approximately 0.001, 0.02 and 0.03 percent annually. Changes in criteria pollutant emissions are considered less than significant.

CO Hotspot Analysis. Carbon monoxide concentrations at 31 study intersections were calculated using the USEPA CAL3QHC micro scale dispersion model. CO concentrations at each study intersection include future ambient one-hour and eight-hour CO concentration of 3.7 and 2.6 ppm, respectively.

As indicated in Table 3.8B-9, the TSM Alternative would result in CO concentrations ranging between 5.8 to 9.9 ppm for one-hour concentrations and from 4.1 to 6.9 ppm for eight-hour concentrations. CO emitted at the 31 study intersections would not exceed the State one- and eight-hour CO standard of 20 ppm and 9 ppm, respectively. No impacts would occur.

TABLE 3.8B-9
TSM ALTERNATIVE CARBON MONOXIDE (CO) CONCENTRATIONS (PARTS PER MILLION)

Intersection	1-Hour CO Concentration	Exceed State 1-Hour Standard (20 ppm)?	8-Hour CO Concentration	Exceed State 8-Hour Standard (9 ppm)?
Lincoln/Olympic	7.3	No	5.1	No
20th/Colorado	7.4	No	5.2	No
San Vicente/Wilshire	8.0	No	5.6	No
Sawtelle/405	8.4	No	5.9	No
Sawtelle/Pico	8.0	No	5.6	No
Sawtelle/National	6.7	No	4.7	No
Sawtelle/Palms	6.7	No	4.7	No
Sawtelle/Venice	8.8	No	6.2	No
Sepulveda/Wilshire	8.5	No	5.9	No
Sepulveda/Pico	8.7	No	6.1	No
Sepulveda/National	8.3	No	5.8	No
Sepulveda/Palms	8.0	No	5.6	No
Sepulveda/Venice	8.8	No	6.2	No
Veteran/Wilshire	8.7	No	6.1	No
Westwood/Santa Monica	6.3	No	4.4	No
Glendon/Wilshire	9.9	No	6.9	No
Ave of Stars/Santa Monica	8.6	No	6.0	No
Santa Monica/Wilshire	9.2	No	6.4	No
S Santa Monica/Wilshire	6.5	No	4.5	No
Beverly/Wilshire	7.3	No	5.1	No
Highland/Olympic	6.2	No	4.3	No
Washington/Washington	7.4	No	5.2	No
Motor/Venice	7.8	No	5.5	No
Culver/Main	5.8	No	4.1	No
Culver/Venice	8.9	No	6.2	No
Robertson/Venice	8.1	No	5.7	No
National/Venice	7.7	No	5.4	No
La Cienega/Jefferson	8.4	No	5.9	No
La Brea/Exposition	6.7	No	4.7	No
Arlington/Exposition	6.7	No	4.7	No
Figueroa/Adams	6.8	No	4.8	No
Girard/Venice	6.0	No	4.2	No

Source: Terry A. Hayes Associates, CAL3QHC output, 2000.

Alternative 1: Wilshire BRT (Baseline Median-Running)

Regional Emissions. Criteria pollutant emissions for the Wilshire BRT Alternative are shown in Table 3.8B-10. The regional VMT for the Full BRT Alignment was estimated using the Los Angeles County Metropolitan Transit Authority (LACMTA) transportation model.

TABLE 3.8B-10 ESTIMATED CHANGE IN CRITERIA POLLUTANT EMISSIONS FOR WILSHIRE BRT					
Vehicular Class	**Annual VMT (millions)**	**Criteria Pollutant Emissions (tons per year)**			
		CO	**NO_X**	**ROG**	**PM_{10}**
Passenger Vehicle (Light duty Auto/Light duty trucks)	141,639.6	491,812	70,259	26,542	3,123
Bus/CNG	237.3	322	1,556	434	5
Commuter Rail/Diesel	4.9	41	122	1,098	28
BRT Total	141,881.8	492,175	71,937	28,074	3,156
BRT vs. No Project	-25.6 (-0.02% change)	-92 (-0.02% change)	-1 (-0.001% change)	7 (0.02% change)	0
BRT vs. TSM	-22.8 (-0.02% change)	-84 (-0.02% change)	-1 (-0.001% change)	2 (0.01% change)	0
VMT = vehicle miles traveled.					
Source: Terry A. Hayes Associates, 2000.					

Annual regional VMT is anticipated to decrease by approximately 0.02 percent annually when compared to the No Action and TSM Alternatives, respectively. Changes in PM_{10} emissions are negligible. CO and No_X emissions are projected to decrease by approximately 0.02 and 0.001 percent, respectively, when compared to both the No Action and TSM Alternatives. However, ROG emissions are projected to increase by approximately 0.02 percent when compared to the No Action Alternative and approximately 0.01 percent when compared to the TSM Alternative. ROG emissions would not increase by over 50 tons per year over No Action conditions. Thus, this alternative complies with CFR 40 Part 51, and a conformity analysis would not be required. Consequently, a beneficial impact is anticipated.

CO Hotspot Analysis. Carbon monoxide concentrations at 31 study intersections were calculated using the USEPA CAL3QHC micro scale dispersion model. CO concentrations at each study intersection include future ambient one-hour and eight-hour CO concentration of 3.7 and 2.6 ppm, respectively.

As indicated in Table 3.8B-11, one-hour CO concentrations at each study intersection would range from 5.7 to 9.4 ppm, and eight-hour CO concentrations would range from4.0 to 6.6 ppm. CO emitted at the 31 study intersections would not exceed the State one- and eight-hour CO standard of 20 ppm and 9 ppm, respectively. Thus, a less than significant impact is anticipated.

TABLE 3.8B-11 WILSHIRE BRT CARBON MONOXIDE (CO) CONCENTRATIONS (PARTS PER MILLION)				
Intersection	**1-Hour CO Concentration**	**Exceed State 1-Hour Standard (20 ppm)?**	**8-Hour CO Concentration**	**Exceed State 8-Hour Standard (9 ppm)?**
Lincoln/Olympic	7.5	No	5.2	No
20th/Colorado	7.4	No	5.2	No
San Vicente/Wilshire	7.9	No	5.5	No
Sawtelle/405	8.4	No	5.9	No
Sawtelle/Pico	8.1	No	5.7	No
Sawtelle/National	6.7	No	4.7	No

TABLE 3.8B-11 WILSHIRE BRT CARBON MONOXIDE (CO) CONCENTRATIONS (PARTS PER MILLION)				
Intersection	**1-Hour CO Concentration**	**Exceed State 1-Hour Standard (20 ppm)?**	**8-Hour CO Concentration**	**Exceed State 8-Hour Standard (9 ppm)?**
Sawtelle/Palms	6.8	No	4.8	No
Sawtelle/Venice	8.7	No	6.1	No
Sepulveda/Wilshire	7.4	No	5.2	No
Sepulveda/Pico	8.7	No	6.1	No
Sepulveda/National	8.3	No	5.8	No
Sepulveda/Palms	8.0	No	5.6	No
Sepulveda/Venice	8.9	No	6.2	No
Veteran/Wilshire	9.4	No	6.6	No
Westwood/Santa Monica	6.4	No	4.5	No
Glendon/Wilshire	7.0	No	4.9	No
Ave of Stars/Santa Monica	8.6	No	6.0	No
Santa Monica/Wilshire	9.2	No	6.4	No
S Santa Monica/Wilshire	7.0	No	4.9	No
Beverly/Wilshire	6.7	No	4.7	No
Highland/Olympic	6.2	No	4.3	No
Washington/Washington	7.3	No	5.1	No
Motor/Venice	7.8	No	5.5	No
Culver/Main	5.7	No	4.0	No
Culver/Venice	9.1	No	6.4	No
Robertson/Venice	7.9	No	5.5	No
National/Venice	7.6	No	5.3	No
La Cienega/Jefferson	8.4	No	5.9	No
La Brea/Exposition	7.3	No	5.1	No
Arlington/Exposition	6.7	No	4.7	No
Figueroa/Adams	6.8	No	4.8	No
Girard/Venice	6.1	No	4.3	No
Source: Terry A. Hayes Associates, CAL3QHC output, 2000.				

CO Emissions from Park-and-Ride Facilities. No park-and-ride facilities will be constructed for the Wilshire BRT since existing facilities would be used. No additional air quality impacts are anticipated.

Alternative 1A: Wilshire BRT (Median Adjacent Design Option)

Regional VMT and carbon monoxide concentrations at study intersections for this option would be similar to that of the Median Reconstruction Design Option since there are no changes to the bus route, or the number of buses traveling along the route, under this option. Thus, a less than significant impact is expected.

Alternative 1B: Wilshire BRT (Curb Adjacent Design Option)

Regional VMT and carbon monoxide concentrations at study intersections for this option would be similar to that of the Median Reconstruction Design Option since there are no changes to the bus route, or the number of buses traveling along the route, under this option. Thus, a less than significant impact is expected.

Alternative 2: Wilshire BRT and Exposition BRT (Full Length)

Regional Emissions. Criteria pollutant emissions for the Wilshire BRT and Exposition BRT are shown in Table 3.8B-12. The regional VMT for this alternative was estimated using the Los Angeles County Metropolitan Transit Authority (LACMTA) transportation model.

TABLE 3.8B-12
ESTIMATED CHANGE IN CRITERIA POLLUTANT EMISSIONS FOR WILSHIRE BRT AND EXPOSITION BRT

Vehicular Class	Annual VMT (millions)	Criteria Pollutant Emissions (tons per year)			
		CO	NO_X	ROG	PM_{10}
Passenger Vehicle (Light duty Auto/Light duty trucks)	141,623.2	491,756	70,251	26,539	3,122
Bus/CNG	238.3	323	1,563	436	5
Commuter Rail/Diesel	4.9	41	122	1,098	28
BRT Total	141,866.4	492,120	71,936	28,073	3,155
BRT vs. No Action	-41 (0.03% change)	-148 (-0.03% change)	-3 (-0.004% change)	5 (0.02% change)	-1 (-0.03% change)
BRT vs. TSM	-38.2 (0.03% change)	-140 (-0.02% change)	-3 (-0.04% change)	0	-1 (-0.03% change)
VMT = vehicle miles traveled.					
Source: Terry A. Hayes Associates, 2000.					

Annual regional VMT is anticipated to decrease by approximately 0.03 percent when compared to the No Action and TSM Alternatives. All criteria pollutant emissions, with the exception of ROG, are projected to decrease under the Wilshire BRT and Exposition BRT. Increase in ROG emissions over the TSM Alternative is negligible. ROG emissions are anticipated to increase by approximately 0.02 percent over the No Action Alternative. Under this alternative, ROG emissions would not increase by over 50 tons per year over No Action conditions, and would comply with CFR 40 Part 51. Thus, a conformity analysis would not be required, and a less than significant impact with respect to ROG is anticipated. A beneficial impact would occur with respect to CO, No_x, and PM_{10} regional emissions.

CO Hotspot Analysis. To provide a worst-case scenario, the traffic consultant conducted traffic analysis for each of the three individual routes (Wilshire BRT, Exposition LRT, and Exposition BRT) rather than the combined routes (Wilshire BRT and Exposition LRT, and Wilshire BRT and Exposition BRT). The traffic analysis for the Wilshire BRT and Exposition BRT were used to calculate CO concentrations at the 31 study intersections. The highest CO concentration at each study intersection from either the Wilshire BRT or Exposition BRT was selected to represent CO concentrations for this alternative (see Table 3.8B-13). Because this alternative consists of both the Wilshire BRT and Exposition LRT, CO concentrations is anticipated to be lower at the study intersections.

As indicated previously, carbon monoxide concentrations at 31 study intersections were calculated using the USEPA CAL3QHC micro scale dispersion model. CO concentrations at each study intersection include future ambient one-hour and eight-hour CO concentration of 3.7 and 2.6 ppm, respectively.

TABLE 3.8B-13
WORST CASE CARBON MONOXIDE (CO) CONCENTRATIONS FOR WILSHIRE BRT AND EXPOSITION BRT (PARTS PER MILLION)

Intersection	1-Hour CO Concentration	Exceed State 1-Hour Standard (20 ppm)?	8-Hour CO Concentration	Exceed State 8-Hour Standard (9 ppm)?
Lincoln/Olympic*	7.5	No	5.2	No
20th/Colorado*	7.4	No	5.2	No
San Vicente/Wilshire	8.0	No	5.6	No
Sawtelle/405	8.4	No	5.9	No
Sawtelle/Pico	7.9	No	5.5	No
Sawtelle/National	6.7	No	4.7	No
Sawtelle/Palms	10.0	No	7.0	No
Sawtelle/Venice	8.8	No	6.2	No
Sepulveda/Wilshire	8.5	No	5.9	No
Sepulveda/Pico	8.7	No	6.1	No
Sepulveda/National*	8.3	No	5.8	No
Sepulveda/Palms*	8.0	No	5.6	No
Sepulveda/Venice	8.9	No	6.2	No
Veteran/Wilshire*	9.4	No	6.6	No
Westwood/Santa Monica*	6.4	No	4.5	No
Glendon/Wilshire	9.9	No	6.9	No
Ave of Stars/Santa Monica	8.6	No	6.0	No
Santa Monica/Wilshire	9.2	No	6.4	No
S Santa Monica/Wilshire*	7.0	No	4.9	No
Beverly/Wilshire	6.8	No	4.8	No
Highland/Olympic	6.2	No	4.3	No
Washington/Washington	7.3	No	5.1	No
Motor/Venice	8.1	No	5.7	No
Culver/Main*	5.7	No	4.0	No
Culver/Venice	10.3	No	7.2	No
Robertson/Venice	11.0	No	7.7	No
National/Venice	7.6	No	5.3	No
La Cienega/Jefferson	8.5	No	5.9	No
La Brea/Exposition*	7.3	No	5.1	No
Arlington/Exposition	6.7	No	4.7	No
Figueroa/Adams	6.9	No	4.8	No
Girard/Venice	6.7	No	4.7	No

* Represents CO concentrations for the Wilshire BRT. All others represent CO concentrations for the Exposition BRT.

Source: Terry A. Hayes Associates, CAL3QHC output, 2000.

As indicated in Table 3.8B-13, the Wilshire BRT and Exposition LRT would result in one-hour CO concentrations to range from 5.7 to 11.0 ppm and eight-hour CO concentrations to range from 4.0 to 7.7 ppm. CO emitted at the 31 study intersections would not exceed the State one- and eight-hour CO standard of 20 ppm and 9 ppm, respectively. A less than significant impact is anticipated.

CO Emissions from Park-and-Ride Facilities. Six new park-and-ride facilities would be constructed for the Exposition BRT and Exposition LRT. The USEPA Industrial Source Complex-Short Term Model (ISCST3) air dispersion model was used to estimate CO emissions at each park-and-ride facility. CO concentrations from each facility were calculated based on lot capacity of each park-and-ride facility. The results were added to year 2020 ambient one-hour and eight-hour ambient CO concentration of 3.7 and 2.6 ppm, respectively (see Table 3.8B-14).

TABLE 3.8B-14
CO EMISSIONS FROM PARK-AND-RIDE FACILITIES –EXPOSITION BRT AND EXPOSITION LRT

Park-and-Ride Facility	Capacity	1-Hour CO Concentration		8-Hour CO Concentration	
		CO Concentration (ppm)[1]	Exceed State 1-Hour Standard (20 ppm)	CO Concentration (ppm)[2]	Exceed State 1-Hour Standard (20 ppm)
Crenshaw/Exposition	400	4.0	No	2.8	No
La Brea/Exposition	41	3.7	No	2.6	No
La Cienega/Jefferson	363	4.0	No	2.8	No
Pico/Sawtelle	585	4.1	No	2.9	No
Bundy/Olympic	372	3.9	No	2.8	No
Cloverfield/Olympic	1,140	4.3	No	3.0	No

[1] CO concentration at each park-and-ride facility is added to the future one-hour ambient CO concentration of 3.7 ppm.
[2] CO concentration at each park-and-ride facility is added to the future one-hour ambient CO concentration of 2.6 ppm.
ppm = parts per million.
Source: Terry A. Hayes Associates, 2000.

As shown in Table 3.8B-14, CO emitted from the park-and-ride facilities is not anticipated to exceed State one- and eight-hour standards. The Cloverfield/Olympic park-and-ride facility would emit the highest one- and eight-hour CO concentrations. The maximum one- and eight-hour CO concentrations at the Cloverfield/Olympic park-and-ride facility are approximately 4.3 and 3.0 ppm, respectively. Because CO is a gas that disperses quickly, concentrations at sensitive receptor locations are expected to be much lower than at the park-and-ride facilities, modeled in this analysis. Thus, no significant increase in carbon monoxide concentrations at sensitive receptor locations is expected, and no significant impacts are anticipated.

Alternative 2A: Wilshire BRT and Exposition BRT (MOS)

Regional Emissions. Criteria pollutant emissions for the Wilshire BRT and Exposition BRT MOS are shown in Table 3.8B-15. The regional VMT for the MOS was estimated using the Los Angeles County Metropolitan Transit Authority (LACMTA) transportation model.

TABLE 3.8B-15
ESTIMATED CHANGE IN CRITERIA POLLUTANT EMISSIONS FOR WILSHIRE BRT AND EXPOSITION BRT MOS

Vehicular Class	Annual VMT (millions)	Criteria Pollutant Emissions (tons per year)			
		CO	NO_X	ROG	PM_{10}
Passenger Vehicle (Light duty Auto/Light duty trucks)	141,625.6	491,764	70,252	26,540	3,122
Bus/CNG	238.3	323	1,563	436	5
Commuter Rail/Diesel	4.9	41	122	1,095	28
BRT Total	141,868.8	492,128	71,937	28,071	3,155
BRT vs. No Action	-38.6 (-0.03 change)	-139 (-0.03% change)	-1 (-0.001% change)	8 (0.03% change)	-1 (-0.03% change)

TABLE 3.8B-15 ESTIMATED CHANGE IN CRITERIA POLLUTANT EMISSIONS FOR WILSHIRE BRT AND EXPOSITION BRT MOS					
	Annual VMT	Criteria Pollutant Emissions (tons per year)			
Vehicular Class	**(millions)**	**CO**	**NO_X**	**ROG**	**PM_{10}**
BRT vs. TSM	-36.2 (-0.03% change)	-131 (-0.03% change)	-1 (-0.001% change)	3 (0.01% change)	-1 (-0.03% change)
VMT = vehicle miles traveled.					
Source: Terry A. Hayes Associates, 2000.					

Annual regional VMT is anticipated to decrease by approximately 0.03 percent annually when compared to the No Action and TSM Alternatives, respectively. CO, PM_{10} and NO_X emissions are projected to decrease by approximately 0.03, 0.001, and 0.03 percent, respectively, when compared to both the No Action and TSM Alternatives. However, ROG emissions are projected to increase by approximately 0.03 percent when compared to the No Action Alternative and approximately 0.01 percent when compared to the TSM Alternative. ROG emissions would not increase by over 50 tons per year when compared to No Action conditions. Thus, this alternative complies with CFR 40 Part 51, and a conformity analysis would not be required. Consequently, a less than significant impact is anticipated.

Alternative 3: Wilshire BRT and Exposition LRT (Full Length)

Regional Emissions. Criteria pollutant emissions for the Wilshire BRT and Exposition LRT are shown in Table 3.8B-16. The regional VMT for this alternative was estimated using the Los Angeles County Metropolitan Transit Authority (LACMTA) transportation model.

TABLE 3.8B-16 ESTIMATED CHANGE IN CRITERIA POLLUTANT EMISSIONS FOR WILSHIRE BRT AND EXPOSITION LRT					
	Annual	Criteria Pollutant Emissions (tons per year)			
Vehicular Class	**VMT (millions)**	**CO**	**NO_X**	**ROG**	**PM_{10}**
Passenger Vehicle (Light duty Auto/Light duty trucks)	141,606.0	491,696	70,242	26,536	3,122
Bus/CNG	234.8	318	1,540	430	5
Commuter Rail/Diesel	4.9	40	121	1,089	27
BRT Total	141,845.7	492,054	71,903	28,055	3,154
BRT vs. No Action	-61.7 (0.04% change)	-212 (-0.04% change)	-35 (-051% change)	-13 (-0.04% change)	-1 (-0.03% change)
BRT vs. TSM	-58.9 (0.04% change)	-204 (-0.04% change)	-36 (-0.05% change)	-18 (-0.06% change)	-1 (-0.03% change)
VMT = vehicle miles traveled.					
Source: Terry A. Hayes Associates, 2000.					

Annual regional VMT is anticipated to decrease by approximately 0.04 percent when compared to the No Action and TSM Alternative. All pollutant emissions are projected to decrease under the Wilshire BRT and Exposition LRT, thus this alternative would have a beneficial affect on air quality in the region. Additionally, this alternative would comply with CFR 40 Part 51 since criteria pollutant emissions are not anticipated to increase. Thus, a conformity analysis would not be required, and a beneficial impact is anticipated.

CO Hotspot Analysis. To provide a worst-case scenario, the traffic consultant conducted traffic analysis for each of the individual routes (Wilshire BRT, Exposition LRT, and Exposition BRT), rather than the combined routes (Wilshire BRT and Exposition LRT, and Wilshire BRT and Exposition BRT). The traffic analysis for the Wilshire BRT and Exposition LRT, were used to calculate CO concentrations at the 31 study intersections. The highest CO concentration at each study intersection from the Wilshire BRT or Exposition BRT was selected to represent CO concentrations for this alternative (see Table 3.8B-17). Because this alternative consists of both the Wilshire BRT and Exposition LRT, CO concentrations would be lower at the study intersections.

As indicated previously, carbon monoxide concentrations at 31 study intersections were calculated using the USEPA CAL3QHC micro scale dispersion model. CO concentrations at each study intersection include future ambient one-hour and eight-hour CO concentration of 3.7 and 2.6 ppm, respectively.

TABLE 3.8B-17
WORST CASE CARBON MONOXIDE (CO) CONCENTRATIONS FOR WILSHIRE BRT AND EXPOSITION LRT (PARTS PER MILLION)

Intersection	1-Hour CO Concentration	Exceed State 1-Hour Standard (20 ppm)?	8-Hour CO Concentration	Exceed State 8-Hour Standard (9 ppm)?
Lincoln/Olympic*	7.5	No	5.2	No
20th/Colorado*	7.4	No	5.2	No
San Vicente/Wilshire	8.0	No	5.6	No
Sawtelle/405	10.4	No	7.3	No
Sawtelle/Pico*	8.1	No	5.7	No
Sawtelle/National	6.7	No	4.7	No
Sawtelle/Palms*	6.8	No	4.8	No
Sawtelle/Venice	8.8	No	6.2	No
Sepulveda/Wilshire	8.4	No	5.9	No
Sepulveda/Pico	8.7	No	6.1	No
Sepulveda/National	8.3	No	5.8	No
Sepulveda/Palms*	8.0	No	5.6	No
Sepulveda/Venice*	8.9	No	6.2	No
Veteran/Wilshire*	9.4	No	6.6	No
Westwood/Santa Monica*	6.4	No	4.5	No
Glendon/Wilshire	9.9	No	6.9	No
Ave of Stars/Santa Monica	8.6	No	6.0	No
Santa Monica/Wilshire	9.2	No	6.4	No
S Santa Monica/Wilshire*	7.0	No	4.9	No
Beverly/Wilshire	6.8	No	4.8	No
Highland/Olympic	6.2	No	4.3	No
Washington/Washington*	7.3	No	5.1	No
Motor/Venice	8.1	No	5.7	No
Culver/Main	5.7	No	4.0	No
Culver/Venice*	9.1	No	6.4	No
Robertson/Venice	11.1	No	7.8	No
National/Venice	7.6	No	5.3	No
La Cienega/Jefferson	8.4	No	5.9	No
La Brea/Exposition*	7.3	No	5.1	No

TABLE 3.8B-17 WORST CASE CARBON MONOXIDE (CO) CONCENTRATIONS FOR WILSHIRE BRT AND EXPOSITION LRT (PARTS PER MILLION)				
Intersection	**1-Hour CO Concentration**	**Exceed State 1-Hour Standard (20 ppm)?**	**8-Hour CO Concentration**	**Exceed State 8-Hour Standard (9 ppm)?**
Arlington/Exposition	6.7	No	4.7	No
Figueroa/Adams	6.9	No	4.8	No
Girard/Venice	6.7	No	4.7	No
* Represents CO concentrations for the Wilshire BRT. All others represent CO concentrations for the Exposition LRT.				
Source: Terry A. Hayes Associates, CAL3QHC output, 2000.				

As indicated in Table 3.8B-17, the Wilshire BRT and Exposition LRT would result in one-hour CO concentrations to range from 5.7 to 11.1 ppm and eight-hour CO concentrations to range from 4.0 to 7.8 ppm. CO emitted at the 31 study intersections would not exceed the State one- and eight-hour CO standard of 20 ppm and 9 ppm, respectively. A less than significant impact is anticipated.

CO Emissions from Park-and-Ride Facilities. Eight new park-and-ride facilities would be constructed for the Exposition BRT and Exposition LRT. As indicated above, the USEPA Industrial Source Complex-Short Term Model (ISCST3) air dispersion model was used to estimate CO emissions at each park-and-ride facility. CO concentrations from each facility were calculated based on lot capacity of each park-and-ride facility. The results were added to year 2020 ambient one-hour and eight-hour ambient CO concentration of 3.7 and 2.6 ppm, respectively (see Table 3.8B-18).

TABLE 3.8B-18 CO EMISSIONS FROM PARK-AND-RIDE FACILITIES –EXPOSITION BRT AND EXPOSITION LRT					
		1-Hour CO Concentration		**8-Hour CO Concentration**	
Park-and-Ride Facility	**Capacity**	**CO Concentration (ppm)[1]**	**Exceed State 1-Hour Standard (20 ppm)**	**CO Concentration (ppm)[2]**	**Exceed State 1-Hour Standard (20 ppm)**
Crenshaw/Exposition	400	4.0	No	2.8	No
La Brea/Exposition	41	3.7	No	2.6	No
La Cienega/Jefferson	363	4.0	No	2.8	No
Venice/Washington	612	4.1	No	2.8	No
Pico/Sawtelle	565	4.1	No	2.9	No
Bundy/Olympic	372	3.9	No	2.8	No
Cloverfield/Olympic	1,140	4.3	No	3.0	No
Ocean/Broadway	100	3.8	No	2.7	No
[1] CO concentration at each park-and-ride facility is added to the future one-hour ambient CO concentration of 3.7 ppm. [2] CO concentration at each park-and-ride facility is added to the future one-hour ambient CO concentration of 2.6 ppm. ppm = parts per million.					
Source: Terry A. Hayes Associates, 2000.					

As shown in Table 3.8B-18, CO emitted from the park-and-ride facilities is not anticipated to exceed State one- and eight-hour standards. The Cloverfield/Olympic park-and-ride facility would emit the highest one- and eight-hour CO concentrations. The maximum one- and eight-hour CO concentrations at the Cloverfield/Olympic park-and-ride facility are anticipated to be approximately

4.3 and 3.0 ppm, respectively. Because CO is a gas that disperses quickly, concentrations at sensitive receptor locations are expected to be much lower than at the park-and-ride facilities, modeled in this analysis. Thus, no significant increase in carbon monoxide concentrations at sensitive receptor locations is expected and no significant impacts are anticipated.

Alternative 3A: Wilshire BRT and Exposition LRT (MOS)

Regional Emissions. Criteria pollutant emissions for the Wilshire BRT and Exposition LRT MOS are shown in Table 3.8B-19. The regional VMT for the MOS was estimated using the Los Angeles County Metropolitan Transit Authority (LACMTA) transportation model.

TABLE 3.8B-19
ESTIMATED CHANGE IN CRITERIA POLLUTANT EMISSIONS FOR WILSHIRE BRT AND EXPOSITION LRT MOS

Vehicular Class	Annual VMT (millions)	Criteria Pollutant Emissions (tons per year)			
		CO	NO_X	ROG	PM_{10}
Passenger Vehicle (Light duty Auto/Light duty trucks)	141,632.1	491,786	70,255	26,541	3,122
Bus/CNG	234.8	320	1,548	432	5
Commuter Rail/Diesel	4.9	41	122	1,097	28
BRT Total	141,871.8	492,128	71,937	28,071	3,155
BRT vs. No Action	-35.6 (-0.03 change)	-120 (-0.02% change)	-14 (-0.02% change)	1 (0.004% change)	-1 (-0.03% change)
BRT vs. TSM	-33.2 (-0.02% change)	-112 (-0.02% change)	-14 (-0.02% change)	-3 (-0.01% change)	-1 (-0.03% change)

VMT = vehicle miles traveled.

Source: Terry A. Hayes Associates, 2000.

Annual regional VMT is anticipated to decrease by approximately 0.03 percent annually over the No Action Alternative and 0.02 percent over the TSM Alternative. CO and PM_{10} emissions are each projected to decrease by approximately 0.02 percent annually over No Action and TSM Alternatives. Additionally, NO_X emission is projected to decrease by approximately 0.03 percent over No Action and TSM Alternatives. ROG is expected to decrease by approximately 0.01 percent when compared to the TSM Alternative. However, ROG emissions are projected to increase by approximately 0.004 percent over the No Action Alternative. ROG emissions would not increase by over 50 tons per year when compared to No Action conditions. Thus, this alternative complies with CFR 40 Part 51, and a conformity analysis would not be required. Consequently, a less than significant impact is anticipated.

Maintenance Yard

The proposed candidate maintenance yards will be a source of air pollutants, largely due to morning warm-up of a large number of vehicles. The warm-up of approximately 70 to 80 double articulate vehicles is expected to generate emissions of carbon monoxide, nitrogen oxides, reactive organic gas, and particulate matter (PM_{10}).

As discussed below, air quality impacts for the six candidate sites will differ depending on the circumstances at each of the yard sites:

Chavez and Mission. It is anticipated that there would be a negligible increase in emissions from this site due to the existing amount of truck activity associated with the salvage yard and auto uses, as well as because of the extensive number of trucks hauling and dumping spoil and soil on the site. It is possible that the conversion of the site to a bus maintenance facility would represent a net decrease in emissions from the site. In addition, no sensitive receptors are located adjacent to the site. No significant impacts are anticipated.

Alameda and 6th Street. Because this site is an existing MTA bus maintenance facility, the overall net change in emissions would be negligible. The 80 CNG-powered buses would likely represent fewer emissions than the current fleet of diesel and CNG buses maintained at the site. There are no sensitive facilities or residential neighborhoods adjacent to the site, however there are several single room occupant residential hotels several blocks away. The incremental impact on these residences is not expected to be significant.

Washington and Alameda Northeast Corner. This site is currently used as a truck trailer transfer area. Diesel trucks bring trailers to the site on a regular basis. The introduction of a bus maintenance facility at this site would also result in either a negligible amount or represent a reduction in emissions from the site. There are no adjacent sensitive receptors, and no significant impacts are anticipated.

Washington and Alameda Southeast Corner. Because the largest portion of this site is vacant it is expected that there would be a net increase in emissions from the site. There are, however, no adjacent sensitive receptors. The nearest residential areas are located south almost a quarter of a mile south of the site. Given that prevailing wind patterns blow from south to north, it is not expected that pollutants from the site would be transported toward the residential area. No significant impacts are anticipated.

Exposition Right-of-Way (Hooper to Central). This candidate site is largely vacant and the introduction of a bus maintenance facility would add new emission sources to the area. Although surrounding land uses are industrial in nature, sensitive residential uses are located within 1/4 mile of the site. High population density, and the proximity of residences, as well as several parks and recreation centers would suggest that air quality of this yard site would have relatively greater significance than the yard sites situated in industrial areas.

South Park Shops (54th and Avalon). Although an MTA facility is currently located on the site, bus storage capacity and activity on this facility is relatively low. The introduction of a maintenance yard for 80 vehicles would likely represent a substantial change from current conditions. Most importantly, the site is located in a South Central Los Angeles residential neighborhood that is extremely dense. Additionally, an elementary school is located less than 500 feet to the west of the site. Although air pollutant emissions would represent an incremental increase above existing conditions, the proximity of numerous sensitive land uses strongly suggests that the increased emissions would be significant.

Mitigation

Given that air quality operation impacts are less than significant, no mitigation is proposed.

3.8B.4 Cumulative Impacts

The proposed project or project alternatives would contribute to an increase in transit ridership, which would reduce criteria pollutant emissions from passenger vehicles. The proposed project or project alternatives would reduce daily regional emissions, thereby decreasing regional negative air quality impacts overall. Thus, each of the build alternatives would contribute to a beneficial cumulative effect on regional air quality.

The three build alternatives would not violate the State CO standards nor would the three build alternatives cause or exacerbate an existing violation of the State CO concentration. However, CO concentrations at several study intersections for each of the three build alternatives were found to be slightly higher than the No Action Alternative. Although the three build alternatives would add to the quantity of CO being produced in the SCAB on a cumulative basis, this increase would not be significant because each of the three build alternatives would not result in additional violations of the State CO standards.

Conformity Analysis

The Regional Transportation Plan (RTP) is a 20-year transportation plan for six counties within the Southern California region (Ventura, Los Angeles, Orange, San Bernardino, Riverside, and Imperial counties). The RTP provides long-term solutions to the region's transportation needs under a framework that meets mobility, air quality regulations, and other regional goals. It is aimed at significantly reducing emissions and pollution, as well as improving air quality in the region. The RTP is revised every three years by the Southern California Association of Governments (SCAG). The last updated plan was adopted by SCAG in April 1998, and reflects changes in regional demographics, environmental factors, land-use forecasts, technology, and subregional planning. Increased public transportation and reduced vehicle trips are an integral part of the RTP. The proposed project or project alternatives are included in the RTP.

The federal conformity only pertains to operational emissions of criteria pollutants. It is not applicable to construction emissions. As discussed above, the incremental increase of ROG concentrations under each of the build alternatives when compared to the No Action Alternative would not exceed the levels listed in Table 3.8B-5. CO, NO_X, and PM_{10} emissions are anticipated to decrease. The three build alternatives would comply with CFR 40 Part 51. Thus, a conformity analysis would not be required. Additionally, the three build alternatives would not result in criteria pollutant concentrations that would exceed the CAAQS. The three build alternatives conform to the RTP.

3.9 Noise and Vibration

3.9.1 Introduction

This section summarizes the analysis of potential airborne noise and ground-borne vibration impacts from the Mid City/Westside Transit Corridor Project.

The potential sources of noise or vibration impact from this project include:

- *Airborne noise from Bus Rapid Transit (BRT) operations.* The major noise sources on a typical fossil-fueled bus include tire-roadway interaction, which increases with speed, and the engine exhaust, which typically has a high source height for buses used in Los Angeles. Additional bus noise sources include ancillary systems such as engine cooling fans, generally located on the roadway side of the vehicle, and air conditioning systems, typically located near the top or rear of the vehicle.

- *Airborne noise from Light Rail Transit (LRT) train operations.* This is the typical noise from electric-powered transit trains passing through communities. Train operations do not cause airborne noise when operating in subway, except for localized areas near vent shafts and tunnel portals. The primary source of airborne noise is steel wheels rolling on steel rails. This rolling noise increases in direct proportion to increases in train speed, and also increases substantially when impacts occur as train wheels traverse the rail gaps and joints of special trackwork for crossovers and turnouts. In addition, noise from transit vehicle auxiliary equipment, such as the air conditioning and traction motor ventilation systems, will sometimes be significant.

- *Audible warning signal noise.* For light rail systems, the standard procedure at grade crossings is for the bells to ring while the gates are lowered, and for the train operator to sound a warning signal as the train approaches the crossing. For this project, it is assumed that bells at grade crossings will ring for a total of 10 seconds for each train, and that the train operator will sound a chime so that use of the substantially louder train horn will not be required except in emergency situations. As such, the noise effects of audible warning signals near grade crossings will be limited, to homes within about 50 feet of grade crossings in quiet areas. For bus operations, no audible warning systems are anticipated for street crossings, and the bus horn would only be used in emergency situations. Audible warning signal noise will be analyzed during preliminary engineering when more detailed design information is available.

- *Appurtenant facility noise.* Appurtenant facility noise can include noise from electric substations, subway ventilation fans and shafts, vehicle maintenance facilities and park and ride lots. Impacts from these sources are limited to localized areas around specific equipment or activities. Noise impacts from appurtenant facilities have not been evaluated as part of this study since the system design is still at a conceptual stage and specific locations for such facilities are not well defined. Appurtenant facility noise will be analyzed during preliminary engineering.

- *Ground-borne vibration and noise from train operations.* The interaction of steel wheels rolling on rails creates vibration that propagates through the track support system and the intervening ground to nearby buildings. The resulting building vibration is referred to as ground-borne or *structure-borne vibration*. The ground-borne vibration may be perceived by building occupants as the vibration of the floors or the rattling of windows, items on shelves or items hanging on the walls. The vibration may also result in ground-borne noise inside buildings, a low-frequency "rumble" radiated by vibrating room surfaces.

- Construction noise and vibration. Construction noise and vibration are temporary impacts that do not have any long-term effects on communities. The potential noise and vibration impacts from construction activities are discussed in Section 3.9.5.

3.9.2 Affected Environment

General descriptions of the land use and existing noise sources along the Wilshire and Exposition project routes are given below:

Wilshire Route. Although the land use along Wilshire Boulevard is predominantly commercial, there are a number of noise-sensitive receptors including residences, hotels, schools, places of worship, parks, and museums and theaters. The greatest concentration of residences is in the Westwood area near Beverly Glen Boulevard, where there are numerous high-rise residential buildings; smaller pockets of single-family or multi-family residences are located in West Los Angeles, Beverly Hills and Hancock Park. Overall, the existing noise levels along Wilshire Boulevard are relatively high, due to the heavy volume of traffic on this major arterial road.

Exposition Route. Summary descriptions of the land use and noise environment along the route, from east to west, are as follows:

- The eastern-most segment, running along Figueroa Street for the BRT alternative and along either Hill Street or Flower Street for the LRT alternative, traverses a primarily commercial and industrial area. Noise-sensitive land use is limited to a hospital, a school and a few buildings that include residential units. The noise environment in this area is dominated by local street traffic, Harbor Freeway traffic and commercial activities.

- The route turns west at Exposition Boulevard, passing The University of Southern California (USC) and Exposition Park. West of Vermont Avenue, the route continues along Exposition Boulevard to La Brea Avenue through a predominantly single-family residential area with schools and parks. Between Vermont Avenue and Arlington Avenue, the noise environment is dominated by high volumes of traffic on the lanes of Exposition Boulevard located both north and south of the alignment. West of Arlington Avenue, Exposition Boulevard runs along the north side of the route, and thus noise levels are higher on the north side than on the south side of the route.

- From La Brea Avenue to Venice Boulevard, the route runs along the south side of first Jefferson Boulevard and then National Boulevard, continuing through a predominantly single-family residential area. Traffic on these streets is the dominant noise source in the area, with higher noise levels on the north side of the route.

- Continuing west, the route follows Venice Boulevard from National Boulevard to Sepulveda Boulevard. The land use along this segment is primarily commercial, with some single-family and multi-family residential buildings as well as one church. Existing noise levels are fairly high in this area due to traffic on Venice Boulevard.

- At Sepulveda Boulevard, the route turns north and follows Sepulveda Boulevard to Exposition Boulevard through a mixed commercial and residential area with one school. The residential land use primarily includes large, multi-family buildings, with some single-family units near the north end of this segment where the route passes under the Santa Monica Freeway. Existing noise levels are fairly high in this area due to traffic on Sepulveda Boulevard.

- At Exposition Boulevard, the route turns west again, crossing under the San Diego Freeway and following Exposition Boulevard along the north side of a single-family residential neighborhood of West Los Angeles. Because this section of Exposition Boulevard is lightly traveled, the existing noise levels are relatively low.

- Crossing into Santa Monica, the route transitions to the western-most segment along and parallel to Olympic Boulevard. Land use in this area is primarily commercial, and noise-sensitive receptors are limited to one park and one school. The existing noise environment in this area is dominated by traffic on Olympic Boulevard.

A noise-monitoring program was performed in July and August 2000 to determine existing levels of noise exposure at noise-sensitive receptors along the routes. Estimating existing noise exposure is an important step in the noise impact assessment since, as discussed below in Section 3.9.3, the thresholds for noise impact are based on the existing levels of noise exposure. Most of the noise monitoring was performed using unattended monitors that were left in place for 24 hours at representative sites to document the variation of noise exposure over a complete day. The 24-hour monitoring was supplemented with short-term noise measurements using a sound level meter. Most of the short-term measurements were made along busy arterial streets, and traffic counts were made at the same time to provide a means of correlating traffic volumes with ambient noise levels.

All of the measurement sites were located in noise-sensitive areas, and were selected to represent the range of existing noise conditions along the routes. Figure 3.9-1 shows the general locations of the monitoring sites.

The noise monitors sample the A-weighted sound level one or more times per second and can be programmed to provide a wide variety of statistics. For this study, the monitors were programmed to collect hourly and daily noise statistics along with information about particularly loud noise events. The daily results are summarized in Table 3.9-1 in terms of the Day-Night Sound Level and the Equivalent Sound Level over the daytime and nighttime hours. The short-term noise survey results are summarized in Table 3.9-2 in terms of 30 to 60-minute equivalent sound levels. These terms are defined below:

- *A-Weighted Sound Level:* To approximate the way the humans respond to sound, a filter circuit with frequency characteristics similar to the human hearing system is built into sound measurement equipment. Measurements with this filter enabled are referred to as *A-weighted sound levels*, expressed in decibels (dBA). Community noise is almost always characterized in terms of A-weighted levels. In relative terms, a noise increase of 3 decibels would be only barely perceptible outside the laboratory, whereas a noise increase of 10 decibels would generally be perceived as an approximate "doubling" of loudness.

Insert Figure 3.9-1 Noise Monitoring Sites

TABLE 3.9-1
LONG-TERM (24-HR) NOISE SURVEY RESULTS

Site No.+	Location (East to West)++	Start		Ldn (dBA)	Leq (dBA)	
		Date	Time		Day*	Night**
WILSHIRE ROUTE						
LT-12	602 Trenton Drive, Beverly Hills			65	61	58
EXPOSITION ROUTE						
LT-13	2400 S. Flower St (Orthopedic Hospital)	08/03/00	15:00	70	66	62
LT-4	1250 Exposition Blvd	07/10/00	16:00	69	67	61
LT-8	1647 Exposition Blvd	07/11/00	18:00	67	67	58
LT-7	2531 Exposition Place***	07/11/00	17:00	58	57	49
LT-11	3719 Exposition Blvd	07/12/00	19:00	65	64	57
LT-10	3500 Muirfield Road	07/12/00	18:00	60	58	52
LT-3	3420 Sycamore Ave	07/10/00	14:00	59	55	53
LT-6	5539 Jefferson Blvd	07/11/00	16:00	68	66	60
LT-2	3437 Caroline Ave, Culver City	07/10/00	13:00	62	60	54
LT-9	10316 Venice Blvd	07/12/00	17:00	73	71	66
LT-5	3251/3261 Sepulveda Blvd	07/11/00	15:00	67	66	58
LT-1	11808 Exposition Blvd, W. Los Angeles	07/10/00	12:00	58	57	49

* Day: 7 am to 10 pm
** Night: 10 pm to 7 am
*** Ldn and Leq values estimated from L33 to exclude non-representative intermittent noise.
+ Sites are shown on Figure 3.9-1.
++ Land uses of these survey locations are shown in the impact tables in Section 3.9.3.

Source: Harris Miller Miller & Hanson Inc., 2000

TABLE 3.9-2
SHORT-TERM (30-60 MIN) NOISE SURVEY RESULTS

Site No.+	Location (East to West)++	Start		Leq dBA)
		Date	Time	
WILSHIRE ROUTE				
ST-6	Wilshire United Methodist Church – Wilshire & Plymouth Blvd	07/12/00	12:30	72
ST-5	Rancho La Brea Tar Pits – Page Museum, Wilshire Blvd	07/12/00	11:20	63
ST-7	Westwood United Methodist Church – Wilshire & Warner Ave	07/13/00	10:45	71
ST-4	Douglas Park – Wilshire Blvd & Chelsea Ave, Santa Monica	07/12/00	09:25	70
EXPOSITION CORRIDOR				
ST-8	2400 S. Flower St (Orthopedic Hospital)	07/13/00	15:15	68
ST-9	John Adams Junior High School – Hill Street, 28th – 30th St	07/13/00	16:25	66
ST-1	USC, Marshall School of Business – 701 Exposition Blvd	07/10/00	17:20	63
ST-10	Dorsey High School – South of Exposition Blvd	07/13/00	17:45	56
ST-3	Charnock Road School – Sepulveda Blvd & Charnock Rd	07/11/00	10:55	68
ST-2	Memorial Park – Olympic Blvd & 14th St, Santa Monica	07/11/00	09:45	62

+ Sites are shown in Figure 3.9-1.
++ Land uses of these survey locations are shown in the impact tables in Section 3.9.3.

Source: Harris Miller Miller & Hanson Inc., 2000

- *Equivalent Sound Level (Leq)*: Leq is a measure of sound energy over a period of time. It is referred to as the *equivalent sound level* because it is equivalent to the level of a steady sound, which, over a referenced duration and location, has the same A-weighted sound energy as the fluctuating sound. Leq's for periods of one hour, the daytime or nighttime hours, and 24 hours are commonly used in environmental assessments. Because Leq is a measure of the total sound energy, any new community noise source will cause Leq to increase. To estimate how transit operations in the Mid-City/Westside Corridor will increase Leq, it is necessary to know the existing Leq and to add in the sound energy that would be generated by all of the transit operations. The more transit operations and the louder the vehicles, the more sound energy is added to the existing Leq.

- *Day-Night Sound Level (Ldn):* Ldn, also abbreviated DNL, is a 24-hour Leq, but with a 10-decibel penalty added to noise events occurring at night. Nighttime is defined as 10 pm to 7 am. The effect of this penalty is that, in the calculation of Ldn, an event during nighttime hours is equivalent to an event during the daytime hours that is 10 decibels louder, or to 10 events at the same sound level during the daytime hours. This strongly weights Ldn toward nighttime noise, since most people are more easily annoyed by noise during the nighttime hours when both background noise is lower and most people are sleeping. Ldn is often used to characterize community noise when assessing community noise impacts. Almost all urban and suburban neighborhoods are in the range of Ldn 50 to 70. An Ldn of 70 dBA represents a relatively noisy area, which might be found near a freeway or a busy surface street. Residential neighborhoods that are not near major sound sources are usually in the range of Ldn 50 to 60 dBA. If there is a freeway or moderately busy arterial nearby, or any substantial nighttime noise, Ldn is usually in the range of 60 to 65 dBA.

The 24-hour noise monitoring results were generalized to estimate the existing Ldn at all residences and noise-sensitive receptors where people normally sleep, and the short-term measurement results were used to estimate the existing Leq at specific institutional land uses with primarily daytime use. The results serve as a basis for the noise impact assessment described below in Section 3.9.3.

With regard to vibration, the primary existing sources along the routes are trucks and buses. Except for sensitive receptors located very close to rough roads, ground-borne vibration from these sources is generally below the threshold of human perception. As described below in Section 3.9.4, the vibration impact assessment is based on absolute criteria, and does not depend on existing levels of ground-borne vibration.

3.9.3 Noise Impact Assessment and Mitigation Measures

Standards of Significance

Noise impact for this project is based on the criteria as defined in the U. S. Federal Transit Administration (FTA) guidance manual *Transit Noise and Vibration Impact Assessment* (FTA Report DOT-T-95-16, April 1995). The FTA noise impact criteria are founded on well-documented research on community reaction to noise and are based on change in noise exposure using a sliding scale. Although more transit noise is allowed in neighborhoods with high levels of existing noise, smaller increases in total noise exposure are allowed with increasing levels of existing noise.

The FTA Noise Impact Criteria group noise sensitive land uses into the following three categories:

- Category 1: Buildings or parks where quiet is an essential element of their purpose.
- Category 2: Residences and buildings where people normally sleep. This includes residences, hospitals, and hotels where nighttime sensitivity is assumed to be of utmost importance.
- Category 3: Institutional land uses with primarily daytime and evening use. This category includes schools, libraries, and churches.

Ldn is used to characterize noise exposure for residential areas (Category 2). For other noise sensitive land uses such as parks and school buildings (Categories 1 and 3), the maximum 1-hour Leq during the facility's operating period is used.

There are two levels of impact included in the FTA criteria. The interpretation of these two levels of impact are summarized below:

- Severe: Severe noise impacts are considered "significant" as this term is used in the National Environmental Policy Act (NEPA) and implementing regulations. Noise mitigation will normally be specified for severe impact areas unless there is no practical method of mitigating the noise.
- Impact: Sometimes referred to as moderate impact, in this range of noise impact, other project-specific factors must be considered to determine the magnitude of the impact and the need for mitigation. These other factors can include the predicted increase over existing noise levels, the types and number of noise-sensitive land uses affected, existing outdoor-indoor sound insulation, and the cost effectiveness of mitigating noise to more acceptable levels.

The noise impact criteria are summarized in Table 3.9-3. The first column shows the existing noise exposure and the remaining columns show the additional noise exposure from the transit project that would cause either moderate or severe impact. The future noise exposure would be the combination of the existing noise exposure and the additional noise exposure caused by the transit project.

TABLE 3.9-3
FTA NOISE IMPACT CRITERIA

Existing Noise Exposure Leq or Ldn	Noise Exposure Impact Thresholds, Ldn or Leq, (1) dBA			
	Category 1 or 2 Sites		Category 3 Sites	
	Impact	Severe Impact	Impact	Severe Impact
<43	Amb.+10	Amb.+15	Amb.+15	Amb.+20
43	52	58	57	63
44	52	59	57	64
45	52	59	57	64
46	52	59	57	64
47	52	59	57	64
48	53	59	58	64
49	53	59	58	64
50	53	60	58	65

TABLE 3.9-3
FTA NOISE IMPACT CRITERIA

Existing Noise Exposure Leq or Ldn	Noise Exposure Impact Thresholds, Ldn or Leq, (1) dBA			
	Category 1 or 2 Sites		Category 3 Sites	
	Impact	Severe Impact	Impact	Severe Impact
51	54	60	59	65
52	54	60	59	65
53	54	60	59	65
54	55	61	60	66
55	55	61	60	66
56	56	62	61	67
57	56	62	61	67
58	57	62	62	67
59	57	63	62	68
60	58	63	63	68
61	58	64	63	69
62	59	64	64	69
63	60	65	65	70
64	60	66	65	71
65	61	66	66	71
66	61	67	66	72
67	62	67	67	72
68	63	68	68	73
69	64	69	69	74
70	64	69	69	74
71	65	70	70	75
72	65	71	70	76
73	65	72	70	77
74	65	72	70	77
75	65	73	70	78
76	65	74	70	79
77	65	75	70	80
>77	65	75	70	80

(1) Ldn is used for land uses where nighttime sensitivity is a factor; maximum 1-hour Leq is used for land use involving only daytime activities.

Category Definitions:

Cat 1: Buildings or parks where quiet is an essential element of their purpose.

Cat 2: Residences and buildings where people normally sleep. This includes residences, hospitals, and hotels where nighttime sensitivity is assumed to be of utmost importance.

Cat 3: Institutional land uses with primarily daytime and evening use. This category includes schools, libraries, and churches.

Source: FTA, 1995.

Methodology for Impact Evaluation

Approach

The approach used to assess the noise impact consists of combining the available data on the project design and planned operational characteristics with models of bus and train noise to project future noise levels. Then, for sensitive receptors, the projections are compared with estimates of existing noise exposure. The steps in the assessment are:

- Determine Study Area Characteristics
- Determine Existing Noise Environment
- Develop Noise Projection Models
- Perform Noise Impact Assessment
- Inventory Impact and Assess Mitigation Options

The final product of the noise assessment is a tabulation of impacts and a list of mitigation measures required to minimize the impacts.

Prediction Model for Bus Noise

The prediction of bus noise is a "worst case" analysis based on source noise measurements of MTA Compressed Natural Gas (CNG) buses on the Ventura Boulevard (Line 750) Metro Rapid bus route, performed in August 2000. The results of the measurements indicated that these buses are louder than the average bus represented by the FHWA Traffic Noise Model (TNM), particularly on the left (exhaust) side of the buses. Actual buses used at the time that the Wilshire or Exposition BRT project is opened for service would most probably generate less noise.

Based on the measurement results, an average reference Sound Exposure Level (SEL) of 81.5 dBA at 50 feet and 24 mph was determined. The SEL is a measure of the sound energy at reference conditions, and is the basis for the prediction of Leq and Ldn. For the purpose of the noise projections, the reference SEL was adjusted for speed, the number of buses per day and the distribution of buses between daytime and nighttime hours. Ldn was calculated based on the bus schedule information summarized in Table 3.9-4. In the calculation of Ldn, buses during the nighttime hours are considered equivalent to ten daytime buses. This reflects the enhanced human sensitivity to noise during the nighttime hours when the noise may disturb sleep or relaxation.

TABLE 3.9-4
BUS SCHEDULES USED FOR NOISE PROJECTIONS

Route	Alternative	Route Segment	Number of Buses	
			Daytime	Nighttime
Wilshire	No Project	Wilshire Boulevard	276	90
	TSM		384	130
	BRT		384	130
Exposition	BRT	7th St/Flower St – Crenshaw Bl	704	220
		Crenshaw Bl – La Cienega Bl	544	164
		La Cienega Bl–Venice/Washington Bl	520	160
		Venice/Washington Bl–Venice/Sepulveda Bl	432	138
		Venice/Sepulveda Bl–Ocean Ave	312	96

Daytime is defined as 7 am to 10 pm; Nighttime is defined as 10 pm to 7 am

Source: Manual Padron & Associates, 2000.

Prediction Model for Train Noise

The train noise prediction model is based on formulas given in the FTA guidance manual, and on measurements of Siemens P2000 light rail vehicles performed by MTA in June 1999 (Los Angeles P2000 Light Rail Vehicle Noise and Vibration Measurement Results," Wilson, Ihrig & Associates, July 1999). The noise projections assume that a two-car consist of 95-ft long light rail vehicles, operating at 40 mph on tangent ballast and tie track, generates a maximum sound level of 75 dBA at 50 feet from the track centerline (over soft ground).

The other components of the noise projections are the schedule (number of trains per day during daytime and nighttime hours), train speed, distance and track configuration. In the calculation of Ldn, trains during the nighttime hours (10 pm to 7 am) are considered equivalent to ten daytime trains. This reflects most people's increased sensitivity to noise at night when it may disturb their sleep or relaxation. The projections assume a total of 224 two-car trains during the daytime and 74 two-car trains during the nighttime. As discussed in Section 3.9.1, noise effects from audible warning signals near grade crossings will be limited, and have not been specifically evaluated for this study.

Comparing the projections for the LRT alternative with the projections for the BRT under similar conditions, it is clear that greater noise exposure is projected for the BRT alternative than for the LRT alternative. This occurs because (1) the buses are noisier than the trains on an individual basis, particularly at lower speeds, and (2) more buses than trains are required for comparable passenger capacity. Significant reductions in bus noise could be incorporated into the project if newly emerging hybrid electric vehicles were to be utilized.

Impacts and Mitigation

No Action Alternative (Baseline)

Under the No Action Alternative, which reflects conditions anticipated for the year 2020 with no major transit improvements, changes in traffic would be limited to normal growth on the existing transit network. As such, noise increases are likely to be less than significant and thus noise impact is not anticipated for the No Action Alternative.

Transportation System Management (TSM) Alternative

Under the TSM Alternative, which includes enhancement of the existing bus system, increased bus traffic and noise are likely to be insignificant relative to the existing traffic conditions on major arterial routes. Thus, noise impact is not anticipated for the TSM Alternative.

Alternative 1: Wilshire BRT (Baseline Median-Running)

Because the land use along Wilshire Boulevard is predominantly commercial, noise impact for the Wilshire BRT alternative was evaluated based on site-specific assessments at the representative noise-sensitive receptors where measurements of existing noise levels were performed. The model of bus noise described above was used to project future bus noise levels, and the FTA criteria were applied to assess the degree of noise impact at these sites.

The results of the noise impact assessment are summarized in Table 3.9-5 for representative noise-sensitive sites with FTA Category 2 and Category 3 land use. These results indicate that no noise impact is projected at these representative locations. Due to the high existing traffic volumes on Wilshire Boulevard, the effect of the added buses is expected to be minimal, with overall noise exposure increases of one decibel or less. Therefore, less than significant noise impacts are anticipated for the Wilshire BRT, and mitigation is not required.

TABLE 3.9-5
SUMMARY OF SITE-SPECIFIC NOISE IMPACT ASSESSMENT FOR THE WILSHIRE BRT

Representative FTA Category 2 Land Use Site								
Site Description	**Dist. (ft)**	**Bus Speed (mph)**	**Exist. Ldn (dBA)**	**Project Ldn (dBA)**			**Future Ldn (dBA)**	**Impact**
				Impact Threshold		**Bus Noise**		
				Impact	**Severe**			
LT-12: S. F. Residence – 602 Trenton Drive, Beverly Hills	140	35	65	61	66	57	66	None
Representative FTA Category 3 Land Use Sites								
Site Description	**Dist. (ft)**	**Bus Speed (mph)**	**Exist. Leq (h) (dBA)**	**Project Leq (h) (dBA)**			**Future Leq (h) (dBA)**	**Impact**
				Impact Threshold		**Bus Noise**		
				Impact	**Severe**			
ST-4: Douglas Park, - Wilshire Blvd & Chelsea Ave, Santa Monica	65	35	70	70	74	60	70	None
ST-5: Rancho La Brea Tar Pits – Page Museum, Wilshire Blvd	110	35	63	65	70	58	64	None
ST-6: Wilshire United Methodist Church – Wilshire & Plymouth Blvd	75	35	72	71	76	59	72	None
ST-7: Westwood United Methodist Church – Wilshire & Warner Ave	120	35	71	71	75	57	71	None
Source: Harris Miller Miller & Hanson Inc., 2000								

<u>Alternative 1A: Wilshire BRT (Median Adjacent Design Option)</u>

The median adjacent design option would not result in a substantial change from noise levels estimated for Alternative 1 shown in Table 3.9-5. As a result, no significant impacts are anticipated. Specifically, the Alternative 1 sound level estimate is based on the two-way BRT operations within a center median guideway on Wilshire Boulevard. The bus noise values in Table 3.9-5 would increase by 1 to 2 dB for Alternative 1A, but they would still be well below the impact threshold.

In the case of a 100-foot Wilshire Boulevard cross section with a receiver located 69 feet from the edge of the curb the equivalent lane distance for the BRT guideway is approximately 99 feet. For Alternative 1A where the medians on Wilshire are retained and bus lanes in either direction are constructed outside the median, the equivalent lane distance for the same receiver as Alternative 1 would increase to approximately 104 feet (a 5-foot increase distance). This increase of 5 feet in the equivalent lane distance would result in a less than one decibel decrease in sound level compared to Alternative 1.

Alternative 1B: Wilshire BRT (Curb Adjacent Design Option)

This option would place BRT operations in the curb lane on either side of Wilshire Boulevard. Compared to Alternative 1, one BRT lane of travel would be moved substantially closer to the noise receiver, and the other substantially further away. The equivalent lane distance of the curb lane operation would represent a 5-foot decrease compared to Alternative 1. This decrease would represent less than a one-decibel increase, and would also not represent a substantial change from the noise levels shown in Table 3.9-5. Thus, similar to Alternative 1, no significant impacts are anticipated.

Alternative 2: Wilshire BRT and Exposition BRT (Full Length)

Alternative 2 includes the impacts associated with the Wilshire BRT and the Exposition BRT. The impacts associated with the Wilshire BRT are described above. For the Exposition BRT alternative, the bus noise model and FTA criteria described above were applied to identify noise-sensitive receptors where alternative noise could cause either moderate or severe noise impact. The results of the noise impact assessment are summarized in Table 3.9-6 in terms of the number of moderate and severe noise impacts for single-family and multi-family residential land uses. The results are broken down by area, including representative distances, bus speeds, impact thresholds and bus noise projections.

The results in Table 3.9-6 indicate that without mitigation, 681 residential noise impacts are anticipated for the Exposition BRT, including 597 with moderate impact and 84 with severe impact. Of the moderate impacts, 459 are at single-family residences and 138 are at multi-family buildings; of the severe impacts, 81 are at single-family residences and only 3 are at multi-family buildings. Most of the severe impacts are anticipated to occur along the south side of the Exposition Boulevard between Arlington Avenue and Crenshaw Boulevard, where the backyards of residences directly abut the route.

TABLE 3.9-6
SUMMARY OF RESIDENTIAL NOISE IMPACT ASSESSMENT FOR THE EXPOSITION BRT (ALTERNATIVES 2 AND 2A)

BRT Alignment Segment	Rep. Distance (ft)	Bus Speed (mph)	Exist Ldn (dBA)	Project Ldn (dBA)			Future Ldn (dBA)	Number of Impacts			
				Impact Threshold		Bus Noise		Impact		Severe	
				Impact	Severe			SF	MF	SF	MF
Exposition Blvd, Vermont Ave to Western Ave	58	40	69	64	69	66	71	102	20	0	0
Exposition Blvd, Western Ave to 2nd Ave	74	30	67	62	68	63	69	81	7	0	0
North side of Exposition Blvd, 2nd Ave to 10th Ave	74	50	67	62	68	65	69	3	2	0	0

TABLE 3.9-6
SUMMARY OF RESIDENTIAL NOISE IMPACT ASSESSMENT FOR THE EXPOSITION BRT (ALTERNATIVES 2 AND 2A)

BRT Alignment Segment	Rep. Distance (ft)	Bus Speed (mph)	Exist Ldn (dBA)	Project Ldn (dBA)			Future Ldn (dBA)	Number of Impacts			
				Impact Threshold		Bus Noise		Impact		Severe	
				Impact	Severe			SF	MF	SF	MF
South side of Exposition Blvd, 2nd Ave to 10th Ave	68	50	58	57	62	66	67	21	0	54	0
North side of Exposition Blvd, Crenshaw Blvd to Field Ave	94	50	65	61	66	62	67	49	6	0	0
South side of Exposition Blvd, Crenshaw Blvd to Farmdale Ave	68	50	60	58	63	65	66	24	1	14	1
South side of Jefferson Blvd, La Brea Ave to Cloverdale Ave	78	50	59	57	63	64	65	12	1	5	0
North side of Jefferson Blvd, La Brea Ave to La Cienega Blvd	162	50	68	63	68	59	68	0	0	0	0
South side of Jefferson Blvd, Cloverdale Ave to Carmona Ave	36	50	63	60	65	70	70	5	1	1	2
North side of National Blvd, Fay Ave to Helms Ave	50	30	62	59	64	65	67	11	0	7	0
Subtotal of impacts (for Alternative 2A only):								**308**	**38**	**81**	**3**
Venice Blvd, Canfield Ave to Sepulveda Blvd	76	50	73	65	72	66	74	17	21	0	0
Sepulveda Blvd, Venice Blvd to Exposition Blvd	78	50	67	62	67	64	69	90	61	0	0
South side of Exposition Blvd, I-405 to Wellesley Ave	126	50	58	57	62	58	61	44	18	0	0
Total of impact (for Alternative 2 only):								**459**	**138**	**81**	**3**

SF = single-family residence, MF = multi-family residential building.

Source: Harris Miller Miller & Hanson Inc., 2000

For non-residential, noise-sensitive sites that fall under FTA Land Use Category 3, site-specific noise impact assessments were performed. The results of this analysis are summarized in Table 3.9-7 for each of the short-term measurement sites along the Exposition route. The results indicate impact at only one site, namely Dorsey High School, located south of the route between Crenshaw Boulevard and La Brea Avenue. However, it should be noted that this impact is limited to the classroom buildings that are closest to the route at the rear of the school grounds.

TABLE 3.9-7
SUMMARY OF NON-RESIDENTIAL NOISE IMPACT ASSESSMENT FOR THE EXPOSITION BRT (ALTERNATIVES 2 AND 2A)

Site Description	Distance (ft)	Bus Speed (mph)	Exist Leq (h) (dBA)	Project Leq (h) (dBA)			Future Leq (h)(dBA)	Impact
				Impact Threshold		Bus Noise		
				Impact	Severe			
ST-8: 2400 S. Flower St. (Orthopedic Hospital)	44	30	68	68	73	64	69	None
ST-9: John Adams Junior High School – Hill Street, 28th-30th St	50	30	66	68	72	63	68	None
ST-1: USC, Marshall School of Business – 701 Exposition Blvd	100	30	63	65	70	57	64	None
ST-10: Dorsey High School – South of Exposition Blvd	62	50	56	61	67	61	62	Impact
The four sites above apply to both Alternatives 2 and 2A.								
ST-3: Charnock Road School - Sepulveda Blvd & Charnock Rd	66	50	68	68	73	61	69	None
ST-2: Memorial Park – Olympic Blvd & 14th St, Santa Monica	38	35	62	64	69	61	65	None
The two sites above apply only to Alternative 2.								
Source: Harris Miller Miller & Hanson Inc., 2000								

<u>Alternative 2A: Wilshire BRT and Exposition BRT (MOS)</u>

Alternative 2A includes the impacts associated with the Wilshire BRT and the Exposition BRT MOS. The impacts associated with the Wilshire BRT are described above. For the Exposition BRT MOS, the impacts are similar, but not as extensive, as those described above for the Exposition BRT alternative. The results in Table 3.9-6 indicate that without mitigation, 430 residential noise impacts are anticipated for the Exposition BRT MOS, including 346 with moderate impact and 84 with severe impact. Of the moderate impacts, 308 are at single-family residences and 38 are at multi-family buildings; of the severe impacts, 81 are at single-family residences and only 3 are at multi-family buildings. Most of the severe impacts are anticipated to occur along the south side of the Exposition Boulevard between Arlington Avenue and Crenshaw Boulevard, where the backyards of residences directly abut the route.

For non-residential, noise-sensitive sites that fall under FTA Land Use Category 3, site-specific noise impact assessments were performed. The results of this analysis are summarized in Table 3.9-7 for each of the short-term measurement sites along the Exposition route. The results indicate impact at only one site, namely Dorsey High School, located south of the route between Crenshaw Boulevard and La Brea Avenue. However, it should be noted that this impact is limited to the classroom buildings that are closest to the route at the rear of the school grounds.

Mitigation

Potentially significant impact could be mitigated with application of the following mitigation options:

- *Mitigation Measure 3.9-1*. Potential noise mitigation approaches for the Exposition BRT (Alternatives 2 and 2A) include the following source, path and receiver options:

  - Quieter Vehicles: Whenever practical, noise control at the source is the most desirable approach. In this case, it would be possible to include noise limits in the vehicle specifications that would require the bus supplier to minimize vehicle noise emissions. The present noise assessment was based on measurements of existing MTA Metro Rapid CNG buses, which were found to generate about 3 dBA more sound energy than the national average for buses. Thus, it would be reasonable to specify noise limits that are at least 3 dBA lower than for these existing buses; greater reductions will likely be feasible in the future when new technology buses become available. Although such limits could add to the vehicle cost, this approach would provide system-wide noise benefit and reduce the need for the path and receiver mitigation measures described below.

  - Sound Barriers: In many cases, noise impacts can be reduced or eliminated by blocking the sound path between the source and receiver by using sound walls and/or berms located along the sides of the alignment. Such barriers are most effective when located close to either the source (bus) or the noise-sensitive receiver. To be effective, sound barriers must also break the direct line of sight from the source to the receiver, have a minimum surface density of 4 lb/sq. ft, and have no holes, drainage gaps or access openings that act as "sound leaks." Barriers can be walls composed of masonry blocks, pre-cast concrete, wood, or metal, depending on aesthetic and cost factors. Where space permits, a barrier may also consist of a wall on top of an earth berm to reduce the amount of wall required. However, due to the height of some of the major bus noise sources (e.g. the exhaust and air-conditioning), the total sound barrier height would need to be on the order of 12 feet to provide a significant noise reduction (in the range of 5 to 10 dBA). The actual noise reduction will depend on the specific site geometry.

  - Sound Insulation: Although noise control at the receiver is typically the least desirable approach, improving the exterior-to-interior sound insulation of buildings is an option that may be applied in areas where other alternatives for noise mitigation are either impractical or not cost effective. This usually requires replacing or improving windows, weather stripping doors, and installing central air-conditioning systems. Central air-conditioning is needed because opening windows or using wall units for ventilation short-circuits the sound insulation improvements.

The results of the noise impact assessment indicate that a noise reduction of 11-12 dBA would be required to eliminate all severe significant noise impacts from the Exposition BRT (Alternatives 2 and 2A). This amount of noise reduction could be achieved with a combination of the above source and path mitigation options, assuming that (1) noise limits are included in the vehicle specification requiring the buses to be 3 dBA quieter than the current MTA Metro Rapid buses and (2) sound barriers are constructed at the locations specified in Table 3.9-8. As shown in this table, a total of 21,750 lineal feet (4.1 miles) of 12-ft high sound wall would be required, at an estimated cost of $5.2 million. Table 3.9-8 shows that this mitigation approach will also eliminate most of the moderate impacts, with residual impacts limited to 22 single-family residences and one multi-family building. To eliminate all noise impacts, building sound insulation would be required at these locations. During preliminary engineering, pre-construction surveys will be carried out to identify site-specific sound insulation measures for properties with residual severe noise impacts that cannot be mitigated by vehicle noise control or construction of sound barriers.

TABLE 3.9-8
SUMMARY OF MITIGATION REQUIRED TO ELIMINATE ALL SEVERE IMPACTS FOR THE EXPOSITION BRT (ALTERNATIVES 2 AND 2A)

Location	Sound Barrier Wall Description			Approx.	Residual Impacts	
	Side	Civil Stations	Length (ft)	Cost	Impact	Severe
Catalina St to Budlong Ave	S	216+50 to 219+50	300	$72,000	0	0
Budlong Ave to Normandie Ave	S	221+00 to 233+00	1200	$288,000	0	0
Normandie Ave to Denker Ave	S	234+ 00 to 246+50	1250	$300,000	0	0
Denker Ave to La Salle Ave	S	247+50 to 250+00	250	$60,000	0	0
Cimmaron St. to Arlington Ave	N	280+00 to 287+00	700	$168,000	0	0
Arlington Ave to 2nd Ave	N	287+50 to 290+50	300	$72,000	0	0
2nd Ave to 3rd Ave	N	291+50 to 294+50	300	$72,000	0	0
2nd Ave to 3rd Ave	S	291+50 to 294+50	300	$72,000	1 SF	0
3rd Ave to 4th Ave	N	295+00 to 298+00	300	$72,000	0	0
3rd Ave to 4th Ave	S	295+00 to 298+01	300	$72,000	4 SF	0
4th Ave to 5th Ave	N	299+00 to 302+50	350	$84,000	0	0
4th Ave to 7th Ave	S	299+00 to 309+00	1000	$240,000	9 SF	0
6th Ave to 7th Ave	N	305+00 to 309+00	400	$96,000	0	0
7th Ave to 9th Ave	S	309+50 to 316+00	650	$156,000	7 SF	0
9th Ave to 10th Ave	N	316+00 to 321+00	500	$120,000	0	0
Crenshaw Blvd to Muirfield Rd	S	342+00 to 363+00	2100	$504,000	0	0
West Blvd	N	360+00 to 363+50	350	$84,000	0	0
Muirfield Rd to Vineyard Ave	S	364+00 to 382+50	1850	$444,000	0	0
Chesapeake Ave to Farmdale Ave	N	372+00 to 375+00	350	$84,000	0	0
Farmdale Ave to Field Ave	N	375+50 to 379+50	400	$96,000	0	0
La Brea Ave to Jefferson Blvd	S	403+50 to 428+00	2450	$588,000	0	0
Hauser Blvd	S	432+00 to 436+50	450	$108,000	1 SF, 1 MF	0
Fay Ave to Helms Ave	N	474+00 to 490+50	1650	$396,000	0	0
Subtotal for Alternative 2A only:			**17700**	**$4,248,000**	**22 SF, 1MF**	**0**
Charnock Rd	S	621+50 to 625+00	350	$84,000	0	0
Palms Blvd	N	340+00 to 347+00	700	$168,000	0	0

TABLE 3.9-8
SUMMARY OF MITIGATION REQUIRED TO ELIMINATE ALL SEVERE IMPACTS FOR THE EXPOSITION BRT (ALTERNATIVES 2 AND 2A)

Location	Sound Barrier Wall Description			Approx.	Residual Impacts	
	Side	Civil Stations	Length (ft)	Cost	Impact	Severe
National Blvd	S	675+00 to 684+00	900	$216,000	0	0
National Blvd	N	681+50 to 684+00	250	$60,000	0	0
I-10 to Richland Ave	N	687+00 to 693+50	650	$156,000	0	0
Richland Ave	N	694+00 to 697+00	300	$720,00	0	0
Sepulveda/Exposition	N	701+00 to 704+00	300	$720,00	0	0
Federal Ave to Barry Ave	S	733+50 to 739+50	600	$144,000	0	0
Total for Alternative 2 only:			**21750**	**$5,220,000**	**22 SF, 1 MF**	**0**

1. Mitigation includes a 3-dBA vehicle noise reduction, plus 12-ft high sound barriers at $20/sq. ft at the locations indicated.
2 SF = single-family residence, MF = multi-family residential building.

Source: Harris Miller Miller & Hanson Inc., 2000

Alternative 3: Wilshire BRT and Exposition LRT (Full Length)

Alternative 3 includes the impacts associated with the Wilshire BRT and the Exposition LRT. The impacts associated with the Wilshire BRT are described above. For the Exposition LRT, the FTA train noise model and criteria described above were applied to identify noise-sensitive receptors where project noise could cause either moderate or severe noise impact. The results of the noise impact assessment are summarized in Table 3.9-9 in terms of the number of moderate and severe noise impacts at single-family and multi-family residences. The results are broken down by area, including representative distances, train speeds, impact thresholds and train noise projections.

The results in Table 3.9-9 indicate that without mitigation, 135 residential noise impacts are anticipated for the Exposition LRT, including 108 with moderate impact and 27 with severe impact. Of the moderate impacts, 97 are at single-family residences and 11 are at multi-family buildings; of the severe impacts, 25 are at single-family residences and only 2 are at multi-family buildings. Most of the severe impacts are projected to occur along the south side of the Exposition Boulevard between Arlington Avenue and Crenshaw Boulevard, where the backyards of residences directly abut the alignment.

TABLE 3.9-9
SUMMARY OF NOISE IMPACT ASSESSMENT FOR THE EXPOSITION LRT (ALTERNATIVES 3 AND 3A)

LRT Alignment Segment	Rep. Distance (ft)	Train Speed (mph)	Exist Ldn (dBA)	Project Ldn (dBA)			Future Ldn (dBA)	Number Impacts			
				Impact Threshold		Train Noise		Impact		Severe	
				Impact	Severe			SF	MF	SF	MF
Flower St, Washington Blvd To Exposition Blvd	20	35	70	64	69	65	71	0	2	0	0
Hill St, Washington Blvd To Exposition Blvd	50	35	70	64	69	60	70	0	0	0	0
Exposition Blvd, Vermont Ave to Western Ave	158	35	69	64	69	47	69	0	0	0	0

TABLE 3.9-9
SUMMARY OF NOISE IMPACT ASSESSMENT FOR THE EXPOSITION LRT (ALTERNATIVES 3 AND 3A)

LRT Alignment Segment	Rep. Distance (ft)	Train Speed (mph)	Exist Ldn (dBA)	Project Ldn (dBA)			Future Ldn (dBA)	Number Impacts			
				Impact Threshold		Train Noise		Impact		Severe	
				Impact	Severe			SF	MF	SF	MF
Exposition Blvd, Western Ave to 2nd Ave	100	55	67	62	68	59	68	0	0	0	0
North side of Exposition Blvd, 2nd Ave to 10th Ave	68	55	67	62	68	61	68	0	0	0	0
South side of Exposition Blvd, 2nd Ave to 10th Ave	32	55	58	57	62	66	67	40	0	23	0
North side of Exposition Blvd, Crenshaw Blvd to Field Ave	68	55	65	61	66	61	67	0	2	0	0
South side of Exposition Blvd, Crenshaw Blvd to Farmdale Ave	62	55	60	58	63	62	64	20	2	0	0
South side of Jefferson Blvd, La Brea Ave to Cloverdale Ave	76	55	59	57	63	61	63	5	0	0	0
North side of Jefferson Blvd, La Brea Ave to La Cienega	188	30	68	63	68	54	68	0	0	0	0
South side of Jefferson Blvd, Cloverdale Ave to Carmona Ave	26	55	63	60	65	67	69	5	0	1	2
North side of National Blvd, Fay Ave to Helms Ave	36	55	62	59	64	66	67	15	0	1	0
Subtotal of impacts (for Alternative 3A only):								**85**	**6**	**25**	**2**
Venice Blvd, Canfield Ave to Sepulveda Blvd	66	35	73	65	72	59	73	0	0	0	0
Sepulveda Blvd, Venice Blvd to Exposition Blvd	64	35	67	62	67	59	68	0	0	0	0
South side of Exposition Blvd, I-405 to Wellesley Ave	150	55	58	57	62	60	62	12	7	0	0
Total of impact (for Alternative 3 only):								**97**	**11**	**25**	**2**
SF = single-family residence, MF = multi-family residential building.											
Source: Harris Miller Miller & Hanson Inc., 2000											

For non-residential, noise-sensitive sites that fall under FTA Land Use Category 3, site-specific noise impact assessments were performed. The results of this analysis are summarized in Table 3.9-10 for each of the short-term measurement sites along the Exposition Corridor. The results indicate that no noise impacts from LRT operations are projected at any of these non-residential sites.

TABLE 3.9-10
SUMMARY OF NON-RESIDENTIAL NOISE IMPACT FOR THE EXPOSITION LRT (ALTERNATIVES 3 AND 3A)

Site Description	Distance (ft)	Train Speed (mph)	Exist Leq(h) (dBA)	Project Leq(h) (dBA)			Future Leq(h) (dBA)	Impact
				Impact Threshold		Train		
				Impact	Severe	Noise		
ST-8: 2400 S. Flower St. (Orthopedic Hospital)	44	35	68	68	73	60	68	None
ST-9: John Adams Junior High School - Hill Street, 28^{th}-30^{th} St	50	35	66	68	72	59	66	None
ST-1: USC, Marshall School of Business – 701 Exposition Blvd	100	30	63	65	70	49	63	None
ST-10: Dorsey High School - South of Exposition Blvd	62	50	56	61	67	58	59	None
The four sites above apply to both Alternatives 3 and 3A.								
ST-3: Charnock Road School - Sepulveda Blvd & Charnock Rd	66	55	68	68	73	59	68	None
ST-2: Memorial Park – Olympic Blvd & 14th St, Santa Monica	38	35	62	64	69	58	63	None
The two sites above apply to Alternative 3 only.								
Source: Hanson Miller MIller Hanson Inc., 2000								

Alternative 3A: Wilshire BRT and Exposition LRT (MOS)

Alternative 3A includes the impacts associated with the Wilshire BRT and the Exposition LRT MOS. The impacts associated with the Wilshire BRT are described above. For the Exposition LRT MOS, the results in Table 3.9-9 indicate that without mitigation, 118 residential noise impacts are anticipated for the Exposition LRT MOS, including 91 with moderate impact and 27 with severe impact. Of the moderate impacts, 85 are at single-family residences and 6 are at multi-family buildings; of the severe impacts, 25 are at single-family residences and only 2 are at multi-family buildings. Most of the severe impacts are anticipated to occur along the south side of the Exposition Boulevard between Arlington Avenue and Crenshaw Boulevard, where the backyards of residences directly abut the route.

For non-residential, noise-sensitive sites that fall under FTA Land Use Category 3, site-specific noise impact assessments were performed. The results of this analysis are summarized in Table 3.9-10 for each of the short-term measurement sites along the Exposition route. The results indicate that no noise impacts from LRT operations are projected at any of these non-residential sites.

Mitigation

- *Mitigation Measure 3.9-2.* Potential noise mitigation approaches for the Exposition LRT (Alternatives 3 and 3A) include the following source, path and receiver options:

  - Improved Wheel and Rail Maintenance: The noise projections assume ongoing programs of wheel and rail maintenance that will keep wheel and rail surfaces in good condition. Although it is possible that modified maintenance procedures could further reduce noise emissions, the effectiveness of any proposed maintenance procedure would need to be demonstrated before it could be considered as a mitigation option.

  - Sound Barriers: In many cases, noise impacts can be reduced or eliminated by blocking the sound path between the source and receiver by using sound walls adjacent to at-grade track sections or located along the outer edges of aerial structures. To be effective, sound barriers must also break the direct line of sight from the source to the receiver, have a minimum surface density of 4 lb/sq. ft, and have no holes, drainage gaps or access openings that act as "sound leaks." Barriers can be walls composed of masonry blocks, pre-cast concrete, wood, or metal, depending on structural, aesthetic and cost factors. Where space permits, a barrier may also consist of a wall on top of an earth berm to reduce the amount of wall required. To provide a significant noise reduction (in the range of 5 to 10 dBA), barriers usually must be about 4 feet high on aerial structure and 8 feet high for at-grade track; the actual noise reduction will depend on the specific site geometry.

  - Sound Insulation: Although noise control at the receiver is typically the least desirable approach, improving the exterior-to-interior sound insulation of buildings is an option that may be applied in areas where other alternatives for noise mitigation are either impractical or not cost effective. This usually requires replacing or improving windows, weather stripping doors, and installing central air-conditioning systems. Central air-conditioning is needed because opening windows or using wall units for ventilation short-circuits the sound insulation improvements.

The results of the noise impact assessment indicate that a noise reduction of 6 dBA would be required to eliminate all severe impacts from the Exposition LRT (Alternatives 3 and 3A). This amount of noise reduction could be easily achieved by constructing 4-ft to 8-ft high sound barrier walls at the locations specified in Table 3.9-11. As shown in this table, a total of 12,750 lineal feet (2.4 miles) of 4-ft to 8-ft high sound wall would be required, at an estimated cost of $2.0 million. Table 3.9-11 shows that this mitigation approach will also eliminate most of the moderate impacts, with residual impacts at only 15 single-family residences. To eliminate all noise impacts, building sound insulation or higher sound walls would be required at these locations. During preliminary engineering, pre-construction surveys will be carried out to identify site-specific sound insulation measures for properties with residual severe noise impacts that cannot be mitigated by vehicle noise control or construction of sound barriers.

TABLE 3.9-11
SUMMARY OF MITIGATION REQUIRED TO ELIMINATE SEVERE IMPACTS FOR THE EXPOSITION LRT (ALTERNATIVES 3 AND 3A)

Location	Sound Barrier Wall Description				Residual Impacts	
	Side	Civil Stations	Length (feet)	Approx. Cost	Impact	Severe
Flower St, 29th St. to 30th St	N	101+00 to 104+50	350	$56,000	0	0
2nd Ave to 3rd Ave	S	291+50 to 294+50	300	$48,000	1 SF	0
3rd Ave to 4thAve	S	295+00 to 298+01	300	$48,000	4 SF	0
4th Ave to 7th Ave	S	299+00 to 309+00	1000	$160,000	8 SF	0
7th Ave to 9th Ave	S	309+50 to 316+00	650	$104,000	1 SF	0
Crenshaw Blvd to Muirfield Rd	S	342+00 to 363+00	2100	$336,000	0	0
Muirfield Rd to Farmdale Ave	S	364+00 to 375+00	1850	$296,000	0	0
Farmdale Ave to Field Ave	N	375+50 to 379+50	400	$64,000	0	0
Alsace Ave to Dunsmuir Ave	S	411+00 to 428+00	1700	$272,000	0	0
Hauser Blvd to Carmona Ave	S	432+00 to 436+00	400	$64,000	1 SF	0
Fay Ave to Helms Ave	N	474+00 to 490+50	1650	$264,000	0	0
Subtotal for Alternative 3A only:			**10700**	**$1,712,000**	**15 SF**	**0**
Sawtelle Blvd	S	714+00 to 718+00	Aerial: 400	$32,000	0	0
Purdue Ave to Gateway Blvd	S	722+00 to 726+00	Aerial: 400	$32,000	0	0
Federal Ave to Barry Ave	S	733+50 to 739+50	600	$96,000	0	0
Granville Ave to Bundy Dr	S	749+00 to 759+00	1000	$160,000	0	0
Total for Alternative 3 only:			**12750**	**$1,976,000**	**15 SF**	**0**

1. Mitigation includes 8-ft high sound barriers at grade and 4 ft. high sound barriers on aerial structures, at a cost of $20/sq. ft at the locations indicated.
2. SF = single-family residence, MF = multi-family residential building.

Source: Harris Miller Miller & Hanson Inc., 2000

Maintenance Yards

As discussed in Section 2, the maintenance yards needed for the BRT operations would accommodate approximately 80 vehicles. Using the FTA General Transit Noise Assessment Methodology (DTIUM60-92-C-41008), the greatest hour of activity (presumably in the early morning hours when buses are leaving the yard to be deployed prior to the rush hour) would result in an Leq of approximately 69 decibels within 50 feet of the facility, and at 300 feet from the yard the Leq would fall off to approximately to 50 decibels.

For candidate yards located in industrial and/or commercial areas (Chavez and Mission, Alameda and 6th, Washington and Alameda Northeast, and Washington and Alameda Southeast the expected noise levels would not affect sensitive land uses and no significant impacts would be anticipated. However, noise levels from the two yard sites near residential areas (Exposition Right-of-Way and South Park Shops) would exceed FTA criteria, particularly in the early morning hours when the ambient noise in these residential areas is typically 50 to 55 decibels. At both yard locations, residential land uses are within 100 feet of the yard site, and significant impact would therefore be anticipated. Measures to mitigate such impact will be developed during preliminary engineering if either of the latter sites is selected.

Subway Design Option at USC/Exposition Park (for Alternatives 2, 2A, 3, and 3A)

With the exception of the use of heavy excavating equipment during the period of construction, no long-term noise impacts affecting either the University of Southern California or Exposition Park/Museums are anticipated from BRT or LRT operations within a subway tunnel between Figueroa and Vermont.

3.9.4 Vibration Impact Assessment and Mitigation Measures

Standards of Significance

Although there has been relatively little research into human response to building vibration, there is considerable experience with ground-borne vibration from rail systems and other common vibration sources. Some conclusions are:

- Ground-borne vibration from transit trains should be characterized in terms of the RMS vibration velocity amplitude, with a one-second time constant. This is in contrast to vibration from blasting and other construction activities that have the potential to cause building damage. For building damage criteria, ground-borne vibration is almost always expressed in terms of the peak particle velocity (PPV).

- The threshold of vibration perception for most humans is around 65 VdB, levels in the 70 to 75 VdB range are often noticeable but acceptable, and levels in excess of 80 VdB are often considered unacceptable.

- For urban transit systems with 10-20 trains per hour over a day, limits for acceptable levels of residential ground-borne vibration are usually between 70 and 75 VdB.

- For human annoyance, there is some relationship between the number of events and the degree of annoyance caused by the vibration. It is intuitive to expect that more frequent vibration events, or events that last longer, will be more annoying to building occupants. Because of the limited amount of information available, there is no clear basis for defining this tradeoff. To account for most commuter rail systems having many fewer daily operations than the typical urban transit line, the criteria in the FTA Guidance Manual include an 8 VdB higher impact threshold if there are fewer than 70 trains per day.

- It is very rare that ground-borne vibration from any type of train operations will be high enough to cause any sort of building damage, even minor cosmetic damage. The only real concern is that the vibration will be intrusive to building occupants or interfere with vibration sensitive equipment.

Tables 3.9-12 and 3.9-13 summarize the FTA impact criteria for ground-borne vibration. These criteria are based on previous standards, criteria, and design goals including ANSI S3.29 (*American National Standard: Guide to the Evaluation of Human Exposure to Vibration in Buildings*, ANSI S3.29-

1983), and the vibration guidelines of the American Public Transit Association (*Guidelines for Design of Rail Transit Facilities*, APTA, 1981).

There are some buildings, such as concert halls, TV and recording studios, and theaters that can be very sensitive to vibration but do not fit into any of the three categories listed in Table 3.9-12. Because of the sensitivity of these buildings, they usually warrant special attention during the environmental assessment of a transit project. Table 3.9-13 gives criteria for acceptable levels of ground-borne vibration for various types of special buildings.

TABLE 3.9-12
GROUND-BORNE VIBRATION IMPACT CRITERIA

Land Use Category	Ground-Borne Vibration Impact (VdB re 1 micro inch/sec)	
	Frequent Events[1]	Infrequent Events[2]
Category 1: Buildings where low ambient vibration is essential for interior operations.	65 VdB[3]	65 VdB[3]
Category 2: Residences and buildings where people normally sleep.	72 VdB	80 VdB
Category 3: Institutional land uses with primarily daytime use.	75 VdB	83 VdB

1. "Frequent Events" is defined as more than 70 vibration events per day. Most rapid transit projects fall into this category.
2. "Infrequent Events" is defined as fewer than 70 vibration events per day. This category includes most commuter rail systems.
3. This criterion limit is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. Vibration sensitive manufacturing or research will require detailed evaluation to define the acceptable vibration levels. Ensuring lower vibration levels in a building often requires special design of the HVAC systems and stiffened floors.

Source: FTA, 1995

TABLE 3.9-13
GROUND-BORNE VIBRATION IMPACT CRITERIA FOR SPECIAL BUILDINGS

Type of Building or Room	Ground-Borne Vibration Impact Levels (VdB re 1 micro-inch/sec)	
	Frequent Events[1]	Infrequent Events[2]
Concert Halls	65 VdB	65 VdB
TV Studios	65 VdB	65 VdB
Recording Studios	65 VdB	65 VdB
Auditoriums	72 VdB	80 VdB
Theaters	72 VdB	80 VdB

1. "Frequent Events" is defined as more than 70 vibration events per day. Most transit projects fall into this category.
2. "Infrequent Events" is defined as fewer than 70 vibration events per day. This category includes most commuter rail systems.
3. If the building will rarely be occupied when the trains are operating, there is no need to consider impact. As an example consider locating a commuter rail line next to a concert hall. If no commuter trains will operate after 7 pm, it should be rare that the trains interfere with the use of the hall.

Source: FTA, 1995

It should also be noted that there are separate FTA criteria for ground-borne noise, the "rumble" that can be radiated from the motion of room surfaces in buildings due to ground-borne vibration from train operations. However, because the effects of airborne noise and ground-borne vibration tend to predominate for above ground (at-grade or elevated) rail systems, ground-borne noise criteria are not applied to this project.

Methodology for Impact Evaluation

Approach

The approach used to assess vibration impact consists of combining the available data on the project design and planned operational characteristics with models of train vibration to project future vibration levels. Then, for sensitive receptors, the projections are compared with applicable vibration criteria. The steps in the assessment are:

- Determine Study Area Characteristics
- Determine Vibration Propagation Characteristics of the Ground
- Develop Vibration Projection Models
- Perform Vibration Impact Assessment
- Inventory Impact and Assess Mitigation Options

The final product of the noise assessment is a tabulation of impacts and a list of mitigation measures required to minimize the impacts.

Prediction Model for Train Vibration

The projection of ground-borne vibration from LRT operations on the Exposition route was based on vibration source data for the proposed Siemens Transportation Systems P2000 light rail vehicle, obtained from tests carried out in April 2000. These data, representing the vibration forces generated by the interaction of the steel wheels rolling on the steel rails, were combined with the vibration propagation characteristics of the ground to provide estimates of ground-borne vibration at sensitive receptor locations. The ground vibration propagation characteristics are based on tests carried out in July 2000 at the following five representative sites:

- *Site V-1:* Site V-1 was located Exposition Place and Fourth Avenue south of the Exposition alignment and west of Arlington Avenue.
- *Site V-2:* Site V-2 was located at Sycamore Avenue and Exposition south of the existing railroad tracks. Sycamore Avenue is located one block west of La Brea.
- *Site V-3:* Site V-3 was located in a small park north of National Boulevard and west of the Ballona Creek culvert.

- *Site V-4:* Site V-4 was located at Corinth and Exposition just west of I-405. The accelerometer line was run south from Exposition along the sidewalk of Corinth.
- *Site V-5:* Site V-5 was the furthest west vibration test site. It was located at Westgate and Exposition in the residential area east of Bundy Drive.

The results at the above sites were used to divide the corridor into three regions with similar ground-borne vibration propagation characteristics as follows:

- *Region A:* Region A includes all areas along the Exposition route to the east of Crenshaw Boulevard.
- *Region B:* Region B includes all areas along the Exposition route between Crenshaw Boulevard and the San Diego Freeway (I-405).
- *Region C:* Region C includes all areas along the Exposition route to the west of the San Diego Freeway (I-405).

The locations of the vibration propagation test sites and regions are shown in Figure 3.9-2.

Impacts

No Action Alternative (Baseline)

Under the No Action Alternative, which reflects conditions anticipated for the year 2020 with no major transit improvements, changes would be limited to normal traffic growth on the existing transit network. As such, vibration impact is not anticipated for the No Action Alternative.

Transportation System Management (TSM) Alternative

The TSM Alternative includes enhancement of the existing bus system. As such, vibration impact is not anticipated for this alternative.

Alternative 1: Wilshire BRT (Baseline Median-Running)

Because this alternative is limited to rubber-tire bus operations, no significant vibration impact is anticipated for the Wilshire BRT. Buses operating on surface streets rarely cause perceptible vibration unless there are potholes or other irregularities in the street surface. Low frequency noise may rattle windows or shake rooms and is sometimes mistaken for vibration. However, this is an airborne noise effect and not a ground-borne vibration effect.

Alternative 1A: Wilshire BRT (Median Adjacent Design Option)

Similar to Alternative 1, because this alternative is limited to rubber-tire bus operations, no significant vibration impact is anticipated for the Wilshire BRT.

Figure 3.9-2 Vibration Propagation Test Sites and Regions

Alternative 1B: Wilshire BRT (Curb Adjacent Design Option)

Similar to Alternative 1, because this alternative is limited to rubber-tire bus operations, no significant vibration impact is anticipated for the Wilshire BRT.

Alternative 2: Wilshire BRT and Exposition BRT (Full Length)

This alternative includes the impacts associated with the Wilshire BRT Alternative and the Exposition BRT. The Wilshire BRT is discussed above. In addition, because this alternative is limited to rubber-tire bus operations, no significant vibration impact is anticipated for the Exposition BRT.

Alternative 2A: Wilshire BRT and Exposition BRT (MOS)

This alternative includes the impacts associated with the Wilshire BRT Alternative and the Exposition BRT MOS. The Wilshire BRT is discussed above. In addition, because this alternative is limited to rubber-tire bus operations, no significant vibration impact is anticipated for the Exposition BRT MOS.

Alternative 3: Wilshire BRT and Exposition LRT (Full Length)

This alternative includes the impacts associated with the Wilshire BRT Alternative and the Exposition LRT. The Wilshire BRT is discussed above. In addition, for the Exposition LRT, the train vibration model and FTA criteria described above were applied to identify sensitive receptors where vibration impact is projected. The results of the vibration impact assessment is summarized in Table 3.9-14 in terms of the number of projected impacts at single-family residences, multi-family buildings and other sensitive receptors. The results are broken down by corridor area, including representative train speeds, distances and train vibration projections.

The results in Table 3.9-14 indicate that without mitigation, vibration impacts are projected at 138 single-family residences, 22 multi-family buildings, one hospital and one school. For the alignment variation that includes Flower Street, the total number of projected impacts is the same except that the hospital and school, located on Hill Street, would not be affected. As shown in the table, approximately 85 percent of the vibration impacts are projected to occur at residences along Exposition Boulevard between Vermont Avenue and Crenshaw Boulevard. Within this area, the greatest concentration of impacts are projected to occur at single-family residences on the south side of the corridor between Arlington Avenue and Crenshaw Boulevard, where residential properties directly abut the route. Impacts to sensitive receptors would be potentially significant.

As discussed above, the test site used to characterize vibration propagation in this area may not be representative of the area. More detailed testing and analysis would be likely to demonstrate that the actual impacts would be lower than the projections in Table 3.9-14.

TABLE 3.9-14
SUMMARY OF GROUND-BORNE VIBRATION IMPACT ASSESSMENT

Track Segment	Train Speed (mph)	Dist. from Near Track Centerline (feet)	Proj. Levels (VdB)	No. of Vibration Impacts		
				SF	MF	Other
Hill St, from Washington Blvd to Exposition Blvd	35	50	93	0	2	1 Hosp. 1 Sch
Flower St, from Washington Blvd to Exposition Blvd	35	20	77	0	2	0
Exposition Blvd, from Vermont Ave to Western Ave	35	48	75	44	17	0
Exposition Blvd, from Western Ave to Arlington Ave	55	62	74	25	0	0
Exposition Blvd, from Arlington Ave to Crenshaw Blvd	55	24	79	59	0	0
Exposition Blvd, from Crenshaw Blvd to La Brea Ave	55	68	58	0	0	0
Jefferson Blvd, from La Brea Ave to La Cienega Blvd	50	20	84	5	3	0
National Blvd, from La Cienega Blvd to Venice Blvd	55	36	75	7	0	0
Subtotal for Alternative 3A only:				**140**	**24**	**2**
Venice Blvd, from National Blvd to Sepulveda Blvd	35	36	75	0	3	0
Sepulveda Blvd, from Venice Blvd to Exposition Blvd	35	50	57	0	0	0
Exposition Blvd, from Sepulveda Blvd to Centinela	55	96	73	4	0	0
Total for Alternative 3 only (Hill Street Option):				**138**	**22**	**1 Hosp.1 Sch**
Total for Alternative 3 only (Flower Street Option):				**138**	**22**	**0**

SF = single-family residence, MF = multi-family residential building.

Source: Harris Miller Miller & Hanson Inc., 2000

Alternative 3A: Wilshire BRT and Exposition LRT (MOS)

This alternative includes the impacts associated with the Wilshire BRT Alternative and the Exposition LRT MOS. The Wilshire BRT is discussed above. The results in Table 3.9-14 indicate that without mitigation, vibration impacts are projected at 140 single-family residences, 24 multi-family buildings, one hospital and one school. For the alignment variation that includes Flower Street, the total number of projected impacts is the same except that the hospital and school, located on Hill Street, would not be affected. As shown in the table, approximately 85 percent of the vibration impacts are projected to occur at residences along Exposition Boulevard between Vermont Avenue and Crenshaw Boulevard. Within this area, the greatest concentration of impacts are projected to occur at single-family residences on the south side of the corridor between Arlington Avenue and Crenshaw Boulevard, where residential properties directly abut the route. Impacts to sensitive receptors would be potentially significant.

Mitigation

As discussed above, the test site used to characterize vibration propagation in this area may not be representative of the area. More detailed testing and analysis would be likely to demonstrate that the actual impacts would be lower than the projections in Table 3.9-14.

- *Mitigation Measure 3.9-3.* The vibration impact assessment assumes that the LRT vehicle wheels and track are maintained in good condition with regular wheel truing and rail grinding. Beyond this, there are several potential mitigation approaches for the Exposition LRT Alternative as follows:

  - LRT Speed Reductions in Sensitive Areas: Speed reductions will always lower ground-borne vibration levels, but they are not always a feasible vibration control measure because of the negative impact on the LRT operating schedule.

  - Ballast Mats: A ballast mat consists of a pad made of rubber or rubber-like material placed on an asphalt or concrete base with the normal ballast, ties and rail on top. The reduction in ground-borne vibration provided by a ballast mat is strongly dependent on the frequency content of the vibration and on the design and support of the mat. However, the field tests and analysis suggest that ballast mats would provide a vibration reduction of 3 to 6 VdB along the Exposition Corridor.

  - Floating Slabs: Floating slabs consist of thick concrete slabs supported by resilient pads on a concrete foundation; the tracks are mounted on top of the floating slab. Most successful floating slab installations are in subways, and their use for at-grade track is rare. Although floating slabs are designed to provide vibration reduction at lower frequencies than ballast mats, they are extremely expensive and are not likely to be a viable mitigation option.

  - Relocation of Turnouts: Because the impacts of LRT wheels over rail gaps at turnout locations can increase LRT ground vibration by as much as 10 VdB, turnouts are a major source of vibration impact when they are located in sensitive areas. Thus, relocating such turnouts away from residential areas to the extent possible can be an effective vibration mitigation measure.

  - Spring-Rail Frogs: Another approach for mitigating vibration impact at turnouts is to use spring-rail frogs in place of standard rigid frogs. These devices close the flangeway gap in the main traffic direction, eliminating the wheel impacts that cause higher vibration levels. Spring-rail frogs can be a cost-effective mitigation measure when traffic is moving in the main direction most of the time.

  - Alignment Modifications: Shifting the alignment further away from sensitive areas can potentially reduce vibration impacts. However, the right-of-way limits typically do not allow shifts that are sufficient to significantly reduce vibration levels. This approach is also limited where sensitive receptors are located on both sides of the alignment. Thus, this approach is not likely to be an effective vibration mitigation measure.

- Property Acquisitions or Easements: Additional options for avoiding vibration impacts are for the transportation agency to purchase residential property likely to be impacted by train operations, or to acquire easements for such properties by paying the homeowners to accept the future train vibration conditions. These approaches are usually taken only in isolated cases where other mitigation options are either impractical or too costly.

Of the above measures, the use of ballast mats is likely to be the most feasible. The recommended locations for ballast mats and the vibration impacts that would remain after the mats are installed are indicated in Table 3.9-15. As shown in the table, with ballast mats installed near vibration-sensitive receptors along 15,700 feet (3.0 miles) of the corridor, there would be residual impacts at 31 single family residences and 3 multi-family buildings for the Hill Street option. For the Flower Street option, there would be residual impacts at 31 single-family residences and 5 multi-family buildings with ballast mats installed near vibration-sensitive receptors along 14,900 feet (2.8 miles) of the corridor. For both options, the estimated cost for vibration mitigation using ballast mats is approximately $5 million. The feasibility of applying additional measures to mitigate the potentially significant residual impacts would need to be investigated during the design phase of the project.

TABLE 3.9-15
SUMMARY OF VIBRATION MITIGATION USING BALLAST MATS

Track Segment	Ballast Mat Description			Residual Impacts		
	Civil Stations	Length (feet)	Approx. Cost	SF	MF	Other
Hill St, from Washington Blvd to Exposition Blvd	129+00 to 143+00	1400	$462,000	0	0	0
Flower St, from Washington Blvd to Exposition Blvd	98+00 to 104+00	600	$198,000	0	2	0
Exposition Blvd, from Vermont Ave to Western Ave	207+00 to 250+00 256+00 to 261+00	4300 500	$1,419,000 $165,000	0	0	0
Exposition Blvd, from Western Ave to Arlington Ave	268+00 to 284+00	1600	$528,000	0	0	0
Exposition Blvd, from Arlington Ave to Crenshaw Blvd	286+00 to 321+00	3500	$1,155,000	23	0	0
Exposition Blvd, from Crenshaw Blvd to La Brea Ave	--	--	--	0	0	0
Jefferson Blvd, from La Brea Ave to La Cienega Blvd	402+50 to 418+00 431+00 to 436+50	1550 550	$511,500 $181,500	5	3	0
National Blvd, from La Cienega Blvd to Venice Blvd	480+50 to 490+00	950	$313,500	1	0	0
Venice Blvd, from National Blvd to Sepulveda Blvd	607+00 to 612+00	500	$165,000	0	0	0
Sepulveda Blvd, from Venice Blvd to Exposition Blvd				0	0	0
Exposition Blvd, from Sepulveda Blvd to Centinela Ave	734+00 to 742+50	850	$280,500	2	0	0
Total (Hill Street Option):		**15700**	**$5,181,000**	**31**	**3**	**0**
Total (Flower Street Option):		**14900**	**$4,917,000**	**31**	**5**	**0**

1. Cost estimate assumes 11-ft wide ballast mats under both tracks at $15/sq. ft at the locations indicated.
2. SF = single-family residence, MF = multi-family residential building.

Source: Harris Miller Miller & Hanson Inc., 2000

These projections of the vibration mitigation requirements should be considered a worst case since the projections have built in safety factors to ensure that no potential vibration impacts are over looked. Should LRT be the preferred alternative, more detailed testing and analysis will be performed during preliminary engineering to more precisely define the mitigation requirements. The additional analysis and testing would include:

- Review of the buildings where impact is projected to make sure they are vibration sensitive and not garages or other non-residential buildings;
- Consideration of the properties that would be acquired as part of the project;
- Making projections for specific buildings including information about the building construction and type of foundation; and
- Vibration propagation tests at specific buildings.

Although not always the case, more detailed vibration projections at later stages of a project usually result in fewer vibration impacts and reducing the amount of vibration mitigation that is required.

Maintenance Yards

Vehicle cleaning and maintenance activities would not result in significant vibration. No vibration impacts are anticipated at the candidate yard locations.

Subway Design Option at USC/Exposition Park (for Alternatives 2, 2A, 3, and 3A)

Neither rubber-tire or light rail vehicle operations within the tunnel would result in vibration impacts on adjacent land uses within the Exposition Park area.

3.9.5 Construction Noise and Vibration

Construction noise and vibration are temporary impacts that do not have any long-term effects on the environment. However, since transit system construction usually extends over several years and will sometimes require nighttime activity, without special control measures, the resulting noise and vibration can be a significant intrusion on nearby communities. It is standard practice to leave specific decisions about construction procedures and equipment to the contractor's discretion, allowing the contractors to develop their most cost effective approach. This means that only a general evaluation of construction noise and vibration can be made during the environmental assessment phase.

Construction Noise Impacts and Mitigation

Impacts from construction noise are likely when ever a construction site would be located within about 300 feet of residences, schools, or places of worship. The impact distances increase substantially for any construction that must be performed during nighttime hours. Based on the preliminary construction plans, there is the potential for short-term impact from construction noise, particularly for the Wilshire BRT alternatives where nighttime construction must be carried out near residential areas.

Construction of the Mid-City/Westside Transit Project will need to be in compliance with the requirements Sections 112.03 and 41.40 of the City of Los Angeles Municipal Code and any variances to the Code issued by the City. The City regulations basically prohibit construction between 9 pm and 7 am without a variance. Although the regulations do not include specific daytime noise limits, they do state that construction or repair work shall not be performed "... in such a manner that the noise created thereby is loud, unnecessary and unusual and substantially exceeds the noise customarily and necessarily attendant to the reasonable and efficient performance of such work."

As discussed above, nighttime construction will require that the City of Los Angeles issue a variance for the proposed nighttime construction on Wilshire Boulevard. As an example, the City of Los Angeles previously issued a noise variance for Metro Red Line construction along Wilshire Boulevard that allowed construction between 9 pm and 7 am as long as: (1) construction noise did not exceed ambient noise level plus 5 decibels, and (2) construction noise did not result in substantial community complaints being registered with the City.

During preliminary engineering, a detailed analysis of construction noise impact will be carried out, and mitigation measures will be developed for inclusion in the construction contract documents. Typical methods to control construction noise include requiring the contractor to construct sound walls, placing restrictions on construction during nighttime hours, limiting the use of particularly noisy activities such as impact pile driving and jack- hammering, and requiring construction to be performed in compliance with specific equipment and property line noise limits. Approaches to ensure that construction is performed in compliance with specified requirements include:

1. *Noise monitoring by the construction management firm*. Regular noise monitoring should be performed in areas where it is expected that the contractor will have difficulty meeting the property line noise limits. This type of monitoring is sometimes the contractor's responsibility, although communities may put more credence in monitoring performed by, or under the direction of, the construction management firm. The monitoring can be weekly spot checks supplemented by monitoring to respond to complaints. Continuous monitoring using automated, unattended monitors is sometimes justified in particularly sensitive areas.

2. *Requiring contractors to retain acoustical engineers to prepare noise control plans*. The goal of the noise control plan is to ensure that contractors consider community noise when designing construction sites, selecting construction procedures and equipment, and determining work schedules.

3. *Limiting the noisy construction activities, particularly during nighttime hours*. Sample restrictions are: requiring pre-drilled piles, limiting pile driving to daytime hours, restricting the use of jackhammers and other pneumatic and impact devices, and limiting muck removal in residential areas to daytime hours.

4. *Requiring contractors to have temporary barriers stockpiled*. Such barriers can be used at the Resident Engineer's discretion to immediately address any noise complaints or noise limit violations.

In addition to the above measures, general procedures that contractors should be required to employ to minimize noise impacts are:

1. *Perform all construction in a manner to minimize noise.* The contractor should be required to select construction processes and techniques that create the lowest noise levels. Examples are using predrilled piles in place of pile driving, mixing concrete off site instead on onsite, and using hydraulic tools instead of pneumatic tools.

2. *Use equipment with effective mufflers.* Diesel engines are often the major source of noise on construction sites. All equipment should be required to have the most effective commercially available mufflers installed.

3. *Minimize the use of backup alarms.* Because of the intrusive nature of backup alarms, they are often the primary source of complaints about construction noise even though they are not the loudest noise. Approaches to reducing annoyance caused by backup alarms are: lay out construction sites to minimize the need for backup alarms; use strobe lights in place of backup alarms at night; use flagmen to keep the area behind maneuvering vehicles clear; and use self-adjusting backup alarms that adjust the alarm loudness up and down depending on ambient noise. The safety implications of any procedure for reducing backup alarm noise will need to be carefully reviewed before the procedure is implemented.

4. *Select haul routes and schedules that minimize intrusion to residential areas*.

5. *Layout construction sites such that the noisiest activities are as far as possible from noise sensitive receptors.* Sometimes it is even possible to gain acoustical benefits by locating temporary construction offices or other barriers between construction activities and residential areas. There are even examples of locating muck storage piles so they act as sound barriers.

Construction Vibration Impacts and Mitigation

The potential for impact from construction vibration is much more limited than for noise, and it is expected that ground-borne vibration from construction activities would cause only intermittent, localized intrusion along the corridor. The construction activities most likely to cause vibration impacts are:

1. *Heavy construction equipment.* Although all heavy, mobile construction equipment has the potential of causing at least some perceptible vibration when operating close to buildings, the vibration is usually short term and is not of sufficient magnitude to cause building damage. It is not expected that heavy equipment such as bulldozers, front end loaders or cranes would operate close enough to any residences to cause vibration impact.

2. *Jackhammers and vibratory compaction equipment.* This type of equipment would be used for relatively short periods of time during the demolition phase, preparation of the subgrade, and during final site restoration. If residents complain about intrusive vibration, the contractor will be required to modify the procedure or arrange to complete the task in a manner that will cause the minimum amount of hardship for the affected residents.

3. *Impact pile driving.* Impact pile driving should be avoided at distances less than 250 feet from any residence. If no other approach is acceptable, the contractor will be required to monitor vibration levels at the residence and modify the procedures if the vibration exceeds a safe threshold.

4. *Tunnel boring machines*. Measurements of Red Line tunneling under Wilshire Boulevard taken in 1993 showed that: (1) all vibration related to tunneling was well below any damage criterion, and (2) tunnel boring machine created low-frequency vibration that would probably be perceived inside some buildings, but did not exceed typical acceptability criteria. Since tunnel boring machines constantly move forward, the vibration is rarely perceptible for more than one or two days.

5. *Muck trains*. The trains used to haul muck (excavated material) from the tunnel face to portals cause ground-borne vibration or ground-borne noise in buildings above the tunnel that residents will sometimes find intrusive, particularly when the muck trains operate at night. Although it is feasible to reduce levels of muck train vibration through use of elastomeric supports or rubber mats under the track, a more common mitigation measure is to limit the hours that muck trains can operate.

6. *Blasting*. Of all construction activities, blasting is the one most often associated with potential building damage. It is not anticipated that blasting would be required for construction of any of the Mid-City/Westside Project alternatives.

7. *Trucks*. Trucks hauling excavated material from construction sites can be sources of vibration intrusion if the haul routes pass through residential neighborhoods on streets with bumps or potholes. Repairing the bumps and potholes can almost always eliminate the problem.

During preliminary engineering, a detailed analysis of construction noise impact will be carried out and pre-construction surveys will be conducted at properties where the potential for significant vibration impact has been identified. In addition, measures to mitigate any anticipated vibration impacts will be developed for inclusion in the construction contract documents. Typical methods to control construction vibration include: (1) specifying vibration limits, (2) placing restrictions on where and when high vibration activities such as pile driving can take place, and (3) requiring vibration monitoring for any construction process that is could cause intrusive or damaging vibration.

3.9.6 Cumulative Impacts

The noise impact analysis presented above has taken into account ambient noise levels as well as noise levels expected from future traffic growth. No additional cumulative impacts are anticipated. In addition, it is not expected that other land development or public works projects within the vicinity of the alternatives being considered would result any combined or cumulative vibration impact on adjacent land uses.

3.10 Geology, Soils, and Seismicity

3.10.1 Introduction

Geology, soils and seismicity are factors that often present constraints to the development of transit improvements, particularly when subsurface or aerial stations or structures are involved. The discussion below presents the relative geotechnical implications of the alternatives under consideration.

3.10.2 Affected Environment

Active and Potentially Active Faults

The Mid-City/Westside Corridor Area (corridor area) is located within a geological area called the Los Angeles Basin. The basin is surrounded by the Santa Monica Mountains, the Simi Hills, and the Santa Susana Mountains on the west, the San Gabriel Mountains on the north, and the Santa Ana Mountains, San Joaquin and Puente Hills to the east. The Pacific Ocean and the Palos Verdes Hills make up the southern border of the basin. Within the basin there are a range of landforms. There are high mountains, for example, the San Gabriel Mountains. There are broad valleys, low hills and coastal plains.

The Los Angeles Basin is an area known to be seismically active and there are a number of active and potentially active faults within the corridor area. Active faults are those that are believed to have moved within the last 11,000 years, while potentially active faults are believed to have moved between 11,000 and 2 million years ago. The faults of particular concern are the Hollywood-Santa Monica fault and the Newport-Inglewood fault. Figure 3.10-1 illustrates the generalized fault zones within the corridor area. Characteristics of these faults are described below:

- Hollywood-Santa Monica Fault. This fault is oriented in an east-west direction. Approximately 24 kilometers in length, it is a left-reverse north-dipping fault. Its slip rate may be greatest at its western end. The slip rate is estimated to be between 0.27 and 0.39 millimeters per year. The probable magnitude of a seismic event on this fault is projected to range from 6.0 to 7.0 on the Richter Scale.

- Newport-Inglewood Fault Zone. The surface trace of this 75-kilometer fault is discontinuous in the Los Angeles Basin, but the fault zone can easily be noted there by the existence of a chain of low hills extending from Culver City to Signal Hill. The fault complex is oriented in a northwest to southeast diagonal direction. South of Signal Hill, it roughly parallels the coastline until just south of Newport Bay, where it heads offshore and becomes the Newport-Inglewood -Rose Canyon fault zone. The fault is characterized as a right lateral, local reverse slip associated with fault steps. The slip rate of the fault is 0.6mm per year. The probable magnitude of a seismic event would range from 6.7 to 7.4 on the Richter Scale.

Figure 3.10-1: Active Fault Zones

Alquist-priolo Fault Hazard Zones

The Alquist-Priolo Earthquake Fault Zoning Act was passed in 1972 to mitigate the hazard of surface faulting to structures for human occupancy. This state law was a direct result of the 1971

San Fernando Earthquake, which was associated with extensive surface fault ruptures that damaged numerous homes, commercial buildings, and other structures. Surface rupture is the most easily avoided seismic hazard. The Alquist-Priolo Earthquake Fault Zoning Act's main purpose is to prevent the construction of buildings used for human occupancy on the surface trace of active faults. The Act only addresses the hazard of surface fault rupture and is not directed toward other earthquake hazards. A review of Alquist-Priolo Fault Hazard maps from the California Department of Conservation (Division of Mines and Geology) indicates that there are several fault hazard zones designated within the corridor as shown in Figure 3.10-2. These zones are located primarily southeast of the La Cienega Boulevard and Washington Boulevard intersection. One of the designated zones crosses the Exposition Railroad right-of-way at National Boulevard and Fay Street in Culver City.

Liquefaction Potential and Other Soil Considerations

In addition to faults, the corridor area is also characterized by soils that are subject to liquefaction. Liquefaction takes places during a seismic event when soils combined with a high water table are unable to support the load bearing weight from structures or foundations. Figure 3.10-3 illustrates that about two-thirds of the corridor area is located within areas of potential liquefaction. Soils classified by the U.S. Soil Conservation Service are generally designated as alluvial deposits from the Los Angeles River (which in the past ran in a northeast to southwest direction through the southern part of the corridor area. Major soil associations found in the corridor area include: Chino Silt Loam, Hanford Clay Loam, Hanford Fine Sandy Loam, Montezuma Clay Adobe, Ramona Clay Loam, Ramona Loam, Ramona Sandy Loam, Yolo Clay Loam, and Yolo Loam.

Other Subsurface Conditions

As disclosed in previous environmental studies of the corridor area, there are hazardous subsurface gas conditions in portions of the corridor north of Interstate 10 and east of Fairfax Avenue. The City of Los Angeles has designated a Methane Hazard Zone as shown in Figure 3.10-4. Exposure to Methane should not exceed the lower explosive limit of 5% volume per volume in air. Previous MTA Metro Red Line environmental studies have also disclosed that that there are high (sometimes) lethal levels of Hydrogen Sulfide captured within the San Pedro geologic formation about 40 feet below the surface. The Occupational Safety and Health Association (OSHA) has established a Hydrogen Sulfide exposure limit for workers to not exceed an exposure of 10ppm personal exposure and the State threshold for public exposure is not to exceed 0.03 ppm. The primary area of the hydrogen sulfide appears to be centered near the Pico Boulevard and San Vicente Boulevard intersection. Borings conducted by the City of Los Angeles Bureau of Engineering as part of the North Outfall Interceptor Sewer Project further suggest that there are few, if any, subsurface gas concerns (methane or hydrogen sulfide) in the southern portions of the corridor centering along Exposition Boulevard (from the Exposition Park Area to Culver City).

Figure 3.10-2: Alquist-Priolo Earthquake Fault Zones

Figure 3.10-3: Potential Liquefaction Areas

Figure 3.10-4: Methane Hazard Zone

3.10.3 Impact Assessment and Mitigation Measures

Standards of Significance

The proposed project and project alternatives would have a significant adverse effect if one or more of the following conditions are met:

- The proposed project or project alternatives would expose people or structures to adverse effects, including the risk of loss, injury or death involving rupture of known earthquake faults, strong seismic ground shaking, landslides or liquefaction; and/or

- The proposed project or project alternatives would expose people to adverse effects of subsurface toxic or explosive gases.

Methodology for Impact Evaluation

The method for assessing the potential for a significant impact involves overlaying the proposed project or project alternatives with known geologic hazards within the corridor. If stations or structures are located within or directly adjacent to a geologic hazard area there would be a potential for a significant impact that would require additional geotechnical studies and enhanced design to eliminate or reduce the potential impact to a level of insignificance.

Impacts

No Action Alternative (Baseline)

The No Action Alternative would not involve the construction of subsurface or aerial transit structures and no exposure to known geologic hazards would be expected. No impacts would occur.

Transportation System Management (TSM) Alternative

The TSM Alternative would be similar to the No Action Alternative. No construction of subsurface or aerial structures is anticipated and no significant geotechnical-related impacts are anticipated.

Alternative 1: Wilshire BRT (Baseline Median-Running)

Although this alternative would traverse areas identified as hazardous, including methane gas and liquefaction, this option would not require the construction of major subsurface or aerial structures and no impacts are anticipated.

Alternative 1A: Wilshire BRT (Median Adjacent Design Option)

Impacts would be similar to Alternative 1, which is discussed above.

Alternative 1B: Wilshire BRT (Curb Adjacent Design Option)

Impacts would be similar to Alternative 1, which is discussed above.

Alternative 2: Wilshire BRT and Exposition BRT (Full Length)

As discussed above, no geotechnical impacts are associated with the Wilshire Boulevard portion of this alternative. Along the Exposition portion, the alignment would create exposure to the following geotechnical hazards:

- The route alignment would traverse the Newport-Inglewood Fault Zone. The aerial structure proposed for La Cienega Boulevard would be located within this zone. Without structure design mitigation, significant impacts would be anticipated.

- The route alignment would traverse an Alquist-priolo Fault Hazard Zone near the intersection of Fay Avenue and National Boulevard in Culver City. However, no subsurface or aerial structures are proposed in this location.

- Approximately 50 percent of the route would traverse areas with high liquefaction potential. Aerial structures at La Cienega, Ballona Creek, Sawtelle and Bundy would be located in these areas. Station platform areas would be located at La Cienega, Sawtelle and Bundy. Without structure design mitigation, significant impacts would be anticipated.

Mitigation Measure 3.10-1 is recommended to reduce geological impacts to a less-than-significant level:

- *Mitigation Measure 3.10-1:* Because the Exposition BRT/MOS proposes structures and aerial stations to be constructed in areas that traverse or adjacent to active or potentially active faults, as well as areas subject to liquefaction during a seismic event, a geotechnical study (prepared by a Registered Geologist) for each affected transit structure shall be required. This technical study shall further assess the potential for seismically related structural failures and identify design requirements for structures and foundations, which will maintain structural integrity under design earthquake conditions.

Alternative 2A: Wilshire BRT and Exposition BRT (MOS)

As discussed above, no geotechnical impacts are associated with the Wilshire Boulevard portion of this alternative. Along the Exposition portion, the alignment would have create exposure to the following geotechnical hazards:

- The route alignment would traverse the Newport-Inglewood Fault Zone. The aerial structure proposed for La Cienega Boulevard would be located within this zone. Without structure design mitigation, significant impacts would be anticipated.

- The route alignment would traverse an Alquist-priolo Fault Hazard Zone near the intersection of Fay Avenue and National Boulevard in Culver City. However, no subsurface or aerial structures are proposed in this location.

- Approximately 70 percent of the route would traverse areas with high liquefaction potential. Aerial structures at La Cienega and Ballona Creek would be located in these areas. The proposed aerial station at La Cienega Boulevard would be located in an area designated with liquefaction potential and would require specific design measures to avoid significant impacts.

Mitigation Measure 3.10-1 would reduce these impacts to a less than significant level.

Alternative 3: Wilshire BRT and Exposition LRT (Full Length)

The geotechnical impacts associated with this alternative would be essentially the same as the Wilshire BRT and Exposition BRT (Alternative 2) discussed above because the same generally route alignment would be followed. The exception would be the eastern portion of the LRT route that would be located on Hill Street between Washington Boulevard and the Exposition railroad right-of-way, and the western portion of the route that would follow Olympic Boulevard west of Cloverfield and then pass over Interstate 10 and 4th Street near the Santa Monica Civic Center. Neither segment is considered to be geotechnically sensitive. The route alignments do not traverse liquefaction areas, Alquist-priolo Fault zones or active or potentially active faults. Thus no additional significant impacts are anticipated.

Mitigation Measure 3.10-2 is recommended to reduce geological impacts to a less-than-significant level:

- *Mitigation Measure 3.10-2:* Because the Exposition LRT/MOS proposes structures and aerial stations to be constructed in areas that traverse or adjacent to active or potentially active faults, as well as areas subject to liquefaction during a seismic event, a geotechnical study (prepared by a Registered Geologist) for each affected transit structure shall be required. This technical study shall further assess the potential for seismically related structural failures and identify design requirements for structures and foundations, which will maintain structural integrity under design earthquake conditions.

Alternative 3A: Wilshire BRT and Exposition LRT (MOS)

Geological and seismic impacts associated with this MOS would be similar to the Wilshire BRT and Exposition BRT MOS (Alternative 2A). Significant impacts would be expected at the aerial structure at La Cienega as well as the portion of the route that traverses the Alquist-priolo Fault Hazard Zone at National Boulevard and Fay Avenue in Culver City.

Mitigation Measure 3.10-2 would reduce these impacts to a less-than-significant level.

Maintenance Yard

As discussed in Section 2 of this report, the MTA is considering candidate maintenance yard site locations for BRT operations. Six candidate sites are under consideration. Geotechnical concerns associated with each of these sites are discussed below.

Northwest Corner of Chavez and Mission. The site is located in an area subject to liquefaction. The site is not located in a Fault Hazard Zone. Without structure design mitigation, impacts would be considered significant for this site.

Existing MTA Division 1 (Alameda and 6th). The yard is not located in an area subject to liquefaction nor is it located in a Fault Hazard Zone. No significant impacts are anticipated.

Northeast Corner of Alameda and Washington. The yard is not located in an area subject to liquefaction nor is it located in a Fault Hazard Zone. No significant impacts are anticipated.

Southeast Corner of Alameda and Washington. The yard is not located in an area subject to liquefaction nor is it located in a Fault Hazard Zone. No significant impacts are anticipated.

Exposition ROW (Hooper to Central). The yard is not located in an area subject to liquefaction nor is it located in a Fault Hazard Zone. No significant impacts are anticipated.

Existing MTA South Park Shops (54th and Avalon). The site is located in an area subject to liquefaction. The site is not located in a Fault Hazard Zone. Without structure design mitigation, impacts would be considered significant for this site.

Mitigation Measure 3.10-3 is recommended to reduce geological impacts to a less-than-significant level:

- *Mitigation Measure 3.10-3:* Prior to the final selection of a maintenance yard site, a geotechnical study shall be prepared by a Registered Geologist indicating the design requirements for yards sites that may be located in areas of liquefaction. Identified requirements shall be incorporated into the specifications for the maintenance yard project.

Subway Design Option at USC/Exposition Park (for Alternatives 2, 2A, 3, and 3A)

As discussed in Section 2, a design option is being considered in the Exposition Park area, where a tunnel would be constructed for either BRT or LRT in the area between Figueroa Street and Vermont Avenue. The tunnel would be constructed at a depth of approximately 40 feet. According to maps available from the California Department of Mines and Geology, the tunnel location is in an area that may be subject to liquefaction, particularly the western most part of the tunnel near Vermont. The tunnel is not located within or adjacent to any other known geologic or seismic hazard.

3.10.4 Cumulative Impacts

Geotechnical and seismic constraint impacts are site specific. The transit alternatives under consideration would affect construction and excavation in limited areas and would not likely combine with other commercial or non-commercial building construction to create a combined impact that would adversely affect the geological integrity or slope stability of adjacent areas.

3.11 Water Resources

3.11.1 Introduction

This section provides a discussion of the existing local surface water bodies, local drainage patterns, and water quality conditions within the Study Area.

3.11.2 Affected Environment

Municipal Water Supply

The Los Angeles Department of Power and Water (LADWP) supplies water for the City of Los Angeles. LADWP is entitled to draw from three main water sources for its supply: the San Fernando Groundwater Basin, the Los Angeles aqueduct, and the Metropolitan Water District (MWD). Other water supply agencies in the Study Area include the City of Santa Monica and the West Basin MWD. The MWD is a wholesale distributor of water from the Colorado River and the State Water Project, and also provides the entire water supply of the City of Beverly Hills, and 80 to 85% of the City of Santa Monica's water supply. The remainder of Santa Monica's water supply is drawn from groundwater. The majority of Culver City's water is supplied by the Southern California Water Company, with a small area on the west side of the City supplied by LADWP.

Flooding

Los Angeles County is subject to a wide range of flood hazards, including those caused by earthquakes, intense storms, and failure of man-made structures. Two damaging regional tsunamis caused by the 1812 Santa Barbara and the 1927 Point Arguello earthquakes indicate that faults off the coast of Southern California are capable of producing large local tsunamis. The tsunami concern is heightened because the short historical record does not adequately characterize the long-term tsunami risk.

The Federal Emergency Management Agency (FEMA) has prepared flood maps identifying areas in Los Angeles County that would be subject to flooding during 100-year and 500-year storms events. These maps indicate that a portion of the project routes are located within these flood zones, although the risk for flood is not any greater than that for most areas in the Central Los Angeles Basin. Portions of the existing Exposition railroad right-of-way (ROW) is below grade and some flooding is possible during storm events.

Local Surface Water Bodies

The project routes stretch ten miles to the east of Santa Monica Bay and the Pacific Ocean, the ultimate receiving water body in the region. No other surface water bodies are located near the Study Area. Santa Monica Bay is considered by both Federal and State governments to be a natural resource of national significance that must be preserved and protected under the Natural Estuary Program. Santa Monica Bay is a United States Federal navigable water body, and is listed as an impaired water body in the Federal listing established under the Clean Water Act, Sections 131.1, 303, 304, and 319.

The project routes are located within the Los Angeles-San Gabriel Hydrologic Unit and more specifically fall within the Ballona Creek Watershed Management Area. Beneficial uses of Ballona Creek include: contact and non-contact water recreation; warm freshwater habitat; wildlife habitat; rare and endangered species preservation, marine habitat; ocean, commercial, and sport fishing; and saline water habitat.

Groundwater

Along the Wilshire route, the regional groundwater table exists at depths in excess of 60 feet. However, areas of shallow and perched water do occur relatively close to the surface in alluvial sediments and channel deposits of Ballona Creek and its tributaries. Perched water tables have been rising since the late 1970s; preliminary engineering studies have confirmed the presence of groundwater close to the surface in areas between Wilshire and Olympic Boulevards. Groundwater along the Exposition route is estimated to be between 60 and 90 feet below the surface. Groundwater may contain high levels of hydrogen sulfide.

Local Drainage Patterns

The surface of the Study Area is substantially impervious (paved), thus the infiltration of surface water into groundwater is currently negligible. Major storm drains in the vicinity of the project routes include two major storm drains in the Mid-City area that collect and convey runoff from the Mid-City area to Ballona Creek. The Los Angeles County Department of Public Works, Hydrologic and Water Conservation Division, maintains the northernmost storm drain. The City of Los Angeles Department of Public Works, Bureau of Engineering, maintains the southernmost storm drain. The portion of the County storm drain located in the Mid-City area is currently estimated to provide about a one-year level of flood protection, well below the 10-year capacity considered by the County to provide a basic level of flood protection. The City storm drain located in the Mid-City area is estimated to provide at least a 10-year level of flood protection. Other storm drain facilities include drains along portions of Windsor Boulevard and Bronson Avenue. In addition, there is an existing 18 by 13.6-foot storm drain along Venice Boulevard.

Within the Study Area, Ballona Creek (East Segment) and the Sepulveda Flood Channel (Central segment) are major sources of drainage. The easterly terminus of Ballona Creek is located about 1.5 miles west of Crenshaw Boulevard, near the intersection of Pickford Street and South Cochran Avenue. Ballona Creek is a concrete flood control channel designed to pass local runoff and floodwaters into the Santa Monica Bay. Flows from Ballona Creek originate from many sources, including point-source discharges from industrial sources and storm water. In addition, irrigation runoff, residential car washing, fire fighting, waterline flushing, swimming pool draining, groundwater denaturing at construction sites, and miscellaneous materials from illegal dumping are discharged into the Creek.

Along the Exposition route, surface drainage flows easterly from Flower Street to the Los Angeles River. Surface drainage north of Exposition Boulevard flows in a northeasterly pattern towards Ballona Creek. South of Exposition Boulevard, drainage flows in a western and southern pattern towards Dominguez Channel.

The rate of surface flow is heavily influenced by the impervious character of the underlying land in which there is little opportunity for percolation down to groundwater tables. Paved streets and buildings cover most of the Study Area. However, the Exposition Boulevard route has a greater percentage of pervious surfaces due to the presence of Exposition Park.

Water Quality

The *Water Quality Control Plan, Los Angeles Region (Basin Plan)*, prepared by the California Regional Water Quality Control Board, Los Angles Region (RWQCB), notes that the major contributors to impaired water in Ballona Creek are pollutants from industrial and municipal effluent, and urban non-point runoff. In addition, untreated sewage overflows discharged into Ballona Creek during the rainy season historically have caused beach closures along Santa Monica Bay. Specific pollutants include high levels of dissolved solids (e.g. chlorides, sulfates, heavy metals), bacteria, nutrients from fertilizers and other sources, petroleum hydrocarbons, sediment, solid waste and debris. Rainfall results in these contaminants entering municipal storm drains, which subsequently convey the contaminants to surface waters. In addition, high concentrations of DDT in sediments at the mouth of Ballona Creek and in Marina del Rey provide evidence of past discharges that have resulted in long-term water quality issues.

Point sources of discharges to surface waters, such as those from industrial facilities, contain a broad range of potential contaminants. Locally, these discharges are regulated by the RWQCB under National Pollutant Discharge Elimination System (NPDES) permit regulations, which have been in effect since the 1970s. The quality of base flow waters in Ballona Creek is defined by these discharges.

The quality of water in Ballona Creek is monitored monthly by the Los Angeles County Department of Public Works, Flood Control Division. Water sampling stations near the Study Area are located along Ballona Creek at Fairfax Avenue and Sawtelle Boulevard. The Fairfax Avenue station collects dry weather flow samples only, while the Sawtelle Boulevard station collects both dry weather and storm flow samples. Presently, storm water in Ballona Creek is not treated prior to discharge into the Santa Monica Bay. A solid waste flap gate in Ballona Creek detains debris contained in dry weather flows.

The water quality data for storm flows from the Sawtelle Boulevard station do not indicate a clear trend in mineral concentrations over the past few years. However, there has been a general increase in concentrations of some bacteria. The variability of the data can be attributed to the intensity of a given storm, the timing of the grab sample, and the unpredictable constituents that may be present in storm water runoff at any particular time. The water quality data for the two station's dry weather lows do not indicate a clear trend based on geographical location.

Regulatory Framework

Federal

Clean Water Act. The primary federal law governing water quality is the Federal Water Pollution Control Act of 1972, amended as the Clean Water Act in 1977. This landmark legislation established the NPDES permit process to regulate point source discharges to surface waters. The 1987 amendment to the Clean Water Act added Section 402(p) which requires the United States Environmental Protection Agency (USEPA) to develop regulations for the control of non-point source discharges, such as urban storm water runoff.

Regulation of Industrial Waste Discharges (Point Source Control). All point source waste dischargers to waters in the Los Angeles region, including Ballona Creek, must be permitted in accordance with the NPDES permitting system administered by the RWQCB. Discharge limits include, if required, effluent and receiving water limits. These limits are set to meet the *Basin Plan* water quality objectives (the *Basin Plan* is described in the Regional Regulation Framework). Each discharger must monitor its discharges, and in some cases receiving waters, and submit monitoring reports to the RWQCB according to a prescribed schedule.

Storm Water Regulations. Federal storm water regulations require municipalities to obtain NPDES permits for storm water discharges from municipal storm drains to surface waters. In 1990, the EPA published final regulations for storm water discharges to implement Section 402(p) of the Clean Water Act. These regulations addressed storm water discharges from industrial storm water collection systems. In November 1991, California issued the NPDES General Permit for Storm Water Discharges Associated with Industrial Activities (General Industrial Permit), which requires industrial facilities to prepare and implement a Storm Water Pollution Prevention Plan (SWPPP) and a monitoring program to control and evaluate the quality of storm runoff discharging off-site, and to eliminate non-storm water discharges to the storm drain system. On April 17, 1997, the State Water Resources Control Board adopted a revised General Industrial Storm Water Permit under Water Quality Order No. 97-03-DWQ. The general permit replaces the previously issued industrial storm water permits, and is mandated under the Federal Clean Water Act Section 402(p).33 U.S.C. Section 1251 et seq.

In addition to the General Industrial Permit, the State Water Resources Control Board (SWRCB) issued a General Construction Activities Storm Water Permit (Construction Permit) in September 1992, which requires applicable construction projects to file a Notice of Intent (NOI) to comply with the requirements of the Permit. The Construction Permit requires construction-site operators to implement a SWPPP to control sediment and other construction-related pollutants from entering the storm drain system.

These two storm water permitting programs – the General Industrial Permit and the General Construction Permit - are a major attempt to control non-point source pollutants in urban runoff that discharge to the local storm drain system and into receiving waters, such as Ballona Creek.

State

Porter-Cologne Act. The Porter-Cologne Water Quality Act of 1969 established the principal California program for water quality control. This Act authorizes the SWRCB to implement the provisions of the Federal Clean Water Act, and divides the State of California into nine RWQCB areas. Each RWQCB implements and enforces provisions of the Clean Water Act, subject to policy guidance and review by the SWRCB. The Study Area is located in RWQCB Region 4.

In addition, the SWRCB has adopted a General Construction permit, requiring that discharges of storm water from construction activities (e.g., clearing, grading, or excavation of land) on five acres or more must be regulated as an industrial activity and must be covered by a NPDES permit. The General Construction permit is implemented and enforced by the nine California Regional Water Quality Control Boards.

The General Construction permit requires dischargers to eliminate/reduce non-storm water discharges to storm water systems, develop and implement a storm water pollution prevention plan (SWPPP), and inspect storm water control structures and pollution prevention measures. According to permit requirements, the SWPPP shall be implemented with the start of construction activities and be kept on-site for projects commencing on and after October 1, 1992. A Best Management Plan (BMP) shall also be prepared for review and approval by the City. The Best Management Plan, also known as a Water Quality Management Plan (WQMP), identifies all appropriate routine and minimum structural and non-structural controls found in the County's Drainage Area Management Plan (DAMP) Appendix G.

Management of water quality typically includes many BMPs to achieve the best possible water quality. BMPs are required by local authorities, and with proper implementation, protect receiving waters from degradation and can correct for existing problems associated with water quality.

Common BMPs include structural controls and non-structural controls. Structural controls used in storm water management describe engineering solutions to water quality problems, such as detention basins, oil/grit separators, grassed swales, filter strips, and porous pavement. The catch basins included with the project are examples of structural controls. Non-structural controls emphasize controlling the source of pollutants, generally by policy or by public education programs.

In order to obtain coverage under the General Construction Permit, the Applicant is required to submit a NOI prior to construction. The NPDES and SWPPP processes are intended to reduce potential water quality impacts to less than significant levels.

Section 402(p) of the Clean Water Act: National Pollutant Discharge Elimination System Program

Control of Construction-Related Erosion and Sedimentation. In order to control and monitor the water quality of waters of the United States, Congress enacted Section 402(p) of the Clean Water Act. Section 402(p) of the Clean Water Act, also termed the NPDES program, requires a storm water discharge permit to control both point and non-point sources of pollutants. Because of the nature of the alternatives considered, urban runoff (a non-point source of pollutants) is of primary concern. Specifically, two types of non-point source discharges are controlled by the NPDES Program – non-point source discharges caused by general construction activities, and the quality of storm water in municipally separate storm sewer systems.

To minimize the potential effects of construction runoff on receiving water quality, the State requires that any construction activity affecting five acres or more must obtain a General Construction Activity Storm Water Permit. Permit applicants are required to prepare a Storm Water Pollution Prevention Plan (SWPPP) and implement BMPs to reduce construction effects on receiving water quality. In 1997, the USEPA proposed revisions to the 1992 General Permit to clarify that all construction activities, even small construction sites that are part of a larger common plan, must be covered under the revised permit. The SWRCB has not yet developed a revised State permit that reflects the new USEPA requirements. Because development of the transit system would collectively disturb more than five acres, any construction would be subject to existing permit requirements and may be subject to the revised permit requirements if, or when, they are adopted by the SWRCB.

Examples of typical BMPs included in SWPPPs are the use of temporary mulching, seeding, or other suitable stabilization measures to protect uncovered soils; storing materials and equipment in a manner that reduces the potential for spills or leaks to enter the storm drain system or surface water system; developing and implementing a spill prevention and cleanup plan; installing traps, filters, or other devices at drop inlets to prevent contaminants from entering storm drains; and using barriers, such as straw bales or plastic, to minimize the amount of uncontrolled runoff that could enter drains or surface waters.

Groundwater Resources. The State of California is not authorized by the California State Water Code to manage groundwater use; instead, case law from various court decisions regulates groundwater use. California landowners have a correlative right to extract as much groundwater as they can put to beneficial use. In some basins, a court has defined that correlative right. In other basins, the correlative right has not yet been defined. Groundwater management programs have usually been developed on an *ad hoc* basis through local agencies, adjudication, and groundwater management districts formed by special legislation. Two additional methods have recently become available: (1) Assembly Bill 3030 (Water Code Section 1750 et seq) allows certain existing local agencies to manage groundwater (i.e., groundwater management districts); and (2) city and county ordinances. The Study Area is neither regulated by a groundwater management district or by city or county ordinance; furthermore, none of the local water districts have been granted statutory authority to regulate groundwater extraction or groundwater recharge.

Maintenance of the Water Quality of Municipally Separate Storm Drainage Systems. Municipal storm water runoff is regulated by municipal permits for a city, county, or groups of cities and counties. The County of Los Angeles received an "early" permit in 1990, prior to the promulgation of the USEPA storm water regulations. The Los Angeles County Municipal Storm Water Permit covers drainage basins associated with the Santa Clara River, Upper and Lower Los Angeles River, Santa Monica Bay, and Upper and Lower San Gabriel River. In summary, the purpose of the municipal storm water runoff permit is to provide a mechanism for monitoring the discharge of pollutants to "waters of the United States" and for establishing appropriate controls for municipally separate storm sewer systems located in municipalities with populations of 100,000 or more.

The City currently operates under the Los Angeles NPDES Municipal Storm Water Permit; as such, the City must ensure that discharges to the storm drain system comply with certain minimum water quality requirements. In order to accomplish this, the City must compile existing data regarding the storm drain system, identify and implement BMPs, and implement a monitoring program for non-point source pollutants.

Waste Discharge Requirements (WDRs)

WDRs for the Discharge of Non-Hazardous Contaminated Soils and Other Wastes in Los Angeles River and Santa Clara River Basins (Order No. 91-93). The afore-referenced WDR allows the disposal of up to 100,000 cubic yards of non-hazardous contaminated soils and other wastes for a maximum period of 90 days. This WDR is not expected to apply to the development of a transit system because there are no known contaminated soils on-site, and any stockpiling of construction-related soils would not occur in a manner that would affect the quality of any waters of the United States.

WDRs for Land Treatment of Petroleum Hydrocarbon Contaminated Soil in Los Angeles and Santa Clara River Basins (Order No. 90-148). The afore-referenced WDR allows the disposal of up to 100,000 cubic yards of petroleum hydrocarbon contaminated soil for a maximum period of 365 days. This WDR is not expected to apply to the proposed project because there is no known contaminated soil on-site, and any stockpiling of construction-related soils would not occur in a manner that would affect the quality of any waters of the United States.

WDRs for Specified Discharges to Groundwater in Santa Clara River and Los Angeles River Basins (Order No. 93-010). The afore-referenced WDR allows the discharge of water resulting from the following activities: hydrostatic testing of tanks, pipes, and storage vessels; construction dewatering; dust control application; water irrigation storage systems; subterranean storage systems; subterranean seepage dewatering; well development and test pumping; aquifer testing, and monitoring well construction. This WDR is expected to apply to the proposed project due to the potential for construction dewatering activities.

Regional

Basin Plan. Under the Clean Water Act, the State was originally required to develop comprehensive basin plans as a prerequisite to receiving federal funding for the construction of municipal waste water treatment plants. The Los Angeles RWQCB developed the *Basin Plan* for Region 4 in 1975, and this plan was most recently updated in 1994. The Basin Plan is designed to preserve and enhance water quality and protect the beneficial uses of all regional waters. Specifically, the Basin Plan (1) designates beneficial uses for surface and groundwater; (2) sets narrative and numerical objectives that must be attained or maintained to protect the designated beneficial uses and conform to the State's anti-degradation policy; and (3) describes implementation programs to protect all waters in the Region. In addition, the Basin Plan incorporates (by reference) all applicable State and Regional plans and policies, as well as other pertinent water quality policies and regulations.

SCAG Regional Comprehensive Plan and Guide

The Southern California Association of Governments (SCAG) adopted a Water Quality Chapter in January 1995 for its *Regional Comprehensive Plan and Guide* (SCAG 1995). The Water Quality Chapter provides a regional perspective on current water quality issues, and has no direct application to the proposed transit alternatives.

3.11.3 Impact Assessment and Mitigation Measures

Standards of Significance

The alternatives considered would result in a significant hydrology and water quality impact if they would:

- Conflict with applicable legal requirements related to hydrology or water quality, including a violation of state water quality standards or waste discharge requirements;
- Substantially degrade groundwater quality or interfere with groundwater recharge, or deplete groundwater resources in a manner that would cause water-related hazards, such as subsidence;
- Alter the existing drainage pattern of the site or area in a manner that would cause substantial flooding, erosion, or siltation;

- Create or contribute to runoff that would exceed the drainage and flood control capacity of existing or planned storm water drainage systems; or
- Place within a 100-year flood hazard area structures that would impede or redirect flood flows, or otherwise expose people and/or property to water-related hazards, such as flooding.

Methodology for Impact Evaluation

The methodology for the evaluation of impacts to hydrology and/or water quality involves an analysis of existing data related to flooding, drainage, and water quality, and an assessment of whether the proposed action would substantially degrade surface or ground water quality; alter drainage patterns in a manner that would cause flooding, erosion, or siltation; result in exposure of people and/or property to water-related hazards; or otherwise conflict with applicable laws related to hydrology and water quality. This analysis does not rely upon a detailed drainage study or a hydrologic flow analysis.

Impacts

No Action Alternative (Baseline)

Impacts related to storm water runoff, flooding, and groundwater resources. As discussed in Section 2.0 of this report, the No Action Alternative would not entail physical changes to the project routes. Instead, the No Action Alternative would focus on operational bus improvements, such as an increase in fleet size, and buses would continue to operate along city streets. This alternative would not result in any impacts to storm water runoff (e.g., direction, rate, or flow), flood hazards, or groundwater resources (e.g., direction, rate, flow, or quality). However, an increase in the bus fleet could result in a negligible impact on surface water quality; this impact would be considered less than significant.

Transportation System Management (TSM) Alternative

Impacts related to storm water runoff, flooding, and groundwater resources. Similar to the No Action Alternative, this alternative would focus on enhancements to and/or restructuring of transit service within the Study Area. MTA local service buses, as well as MTA Rapid Bus service, would continue to operate along city streets. This alternative would not result in any impacts to storm water runoff (e.g., direction, rate, or flow), flood hazards, or groundwater resources (e.g., direction, rate, flow, or quality). However, an increase in the bus fleet could result in a negligible impact on surface water quality; this impact would be considered less than significant.

Alternative 1: Wilshire BRT(Baseline Median-Running)

Impacts related to storm water runoff. The Wilshire BRT Alternative would be limited to the provision of BRT service within the existing Wilshire Boulevard ROW. This alternative would not require any grading, and all surface water would continue to drain to the existing storm drain systems at the existing volumes and velocities. No significant impacts to the direction, rate, or flow of surface water is anticipated with implementation of Alternative 1. However, an increase in the bus fleet, as well as the provision of additional parking areas (i.e., park-and-ride lots), could result in a negligible impact on surface water quality; however, this impact would be considered less than significant.

Impacts related to flooding. As illustrated by Figure 3.11-1, a portion of the Wilshire BRT would be subject to flooding during 100-year and 500-year storm events. During these storm events, portions of Wilshire Boulevard are, and will continue to be, subject to limited flooding of short duration. Implementation of this alternative would neither create nor contribute to runoff that would exceed the drainage and flood control capacity of the storm drain system, nor would it impede or redirect flood flows. Furthermore, because the transit stops are located outside of the street systems, where a majority, if not all, of the drainage occurs, implementation of this alternative would also not expose people and/or property to water-related hazards. Impacts resulting from flood hazards with implementation of Alternative 1 are considered to be less than significant.

Impacts related to groundwater resources. Because this alternative would not require any grading, and the entire Wilshire Boulevard route is currently paved, implementation of this alternative would also not result in an increase in the amount of impervious surfaces; therefore, there would be no impact to groundwater resources (direction, rate, flow, or quality). Further, this alternative will not draw from any groundwater aquifer. Impacts to groundwater resources would be less than significant.

Alternative 1A: Wilshire BRT (Median Adjacent Design Option)

With this design option, all components of the Wilshire BRT would be the same, except the BRT would operate exclusively in the existing lanes adjacent to the median. Therefore, the hydrology and water quality impacts resulting from construction and implementation of Alternative 1A would be identical to Alternative 1, and less than significant impacts would occur.

Alternative 1B: Wilshire BRT (Curb Adjacent Design Option)

With this design option, all components of the Wilshire BRT would be the same, except the BRT would operate exclusively in the existing lanes adjacent to the curb. Therefore, the long-term hydrology and water quality impacts resulting from construction and implementation of Alternative 1B would be identical to Alternative 1, and less than significant impacts would occur. However, in order to provide an improved curb-lane running surface for buses, some of the existing storm drains must be reconstructed as part of the resurfacing process. Al reconstruction activities will occur with the review and approval of the Engineering Bureau of each City through which the alignment traverses; as such, less-than-significant impacts are anticipated.

Alternative 2: Wilshire BRT and Exposition BRT (Full Length)

Impacts related to storm water runoff. As previously discussed, the Wilshire BRT would be limited to the ROW of Wilshire Boulevard. The Exposition BRT also follows existing public ROWs and is largely contained within the limits of city streets or a former railroad ROW now owned by the MTA. Implementation of this alternative would result in limited grading (to replace the dirt railroad ROW with asphalt to accommodate buses) and a slight increase in impermeable surface area. Therefore, runoff volumes, flows, and velocities would be slightly altered; however, surface runoff would be directed into a constructed drainage system, and impacts would be considered less than significant.

Impacts related to flooding. As illustrated by Figure 3.11-1, a portion of the Wilshire Boulevard route and Exposition Boulevard route would be subject to flooding during the 100-year and 500-year storm events. During these storm events, portions of both routes are, and will continue to be, subject to limited flooding of short duration. Implementation of this alternative would neither

Figure 3.11-1 100-Year and 500-Year Floodplains create nor contribute to runoff that would exceed the drainage and flood control capacity of the storm drain system, nor would it impede or redirect flood flows. Furthermore, because the transit stops are located outside of the street systems, where a majority, if not all, of the drainage occurs, implementation of this alternative would also not expose people and/or property to water-related hazards. Impacts as a result of flood hazards with implementation of Alternative 2 are considered to be less than significant.

Impacts related to groundwater resources. An increase in impervious surfaces would also result in a limited reduction in local groundwater recharge opportunities due to the decreased percolation of rainwater through the soil. Precipitation in the Study Area, however, is characterized by infrequent storms during a brief rainy season, and surface water infiltration is minimal, particularly along the narrow railroad ROW. The majority of recharge to the groundwater supply in Los Angeles County comes from large, natural stream systems or constructed groundwater recharge basins. Therefore, the reduced recharge potential associated with additional impermeable surfaces proposed for the Exposition BRT would be considered less than significant.

Alternative 2A: Wilshire BRT and Exposition BRT (MOS)

The Exposition BRT MOS component of Alternative 2 would terminate at the Venice/Washington Station. Given that the Wilshire BRT impacts have been disclosed above, and the MOS option of the Exposition BRT is only a shorter route of the full-length alternative, the hydrology and water quality impacts resulting from construction and operation of Alternative 2A would be similar to Alternative 2. No hydrology and water quality impacts would occur west of the Venice/Washington Station, and no increased hydrology and water quality impacts would occur at the westernmost MOS station location. Impacts would be less than significant.

Alternative 3: Wilshire BRT and Exposition LRT (Full Length)

Impacts related to storm water runoff, flooding, and groundwater resources. As previously discussed, the Wilshire BRT would be limited to the ROW of Wilshire Boulevard. The Exposition LRT also follows existing public ROWs and is largely contained within the limits of city streets or a former railroad ROW now owned by the MTA. Implementation of this alternative would result in limited grading (to replace the dirt railroad ROW with light rail tracks) and a slight increase in impermeable surface area. Therefore, the potential impacts to hydrology and water quality that would result from implementation of Alternative 3 would be substantially similar to the hydrology and water quality impacts that are anticipated to result from implementation of Alternative 2. No significant impacts to local or regional surface water quality, storm water runoff and flood hazards, or groundwater resources are anticipated to occur. Impacts as a result of implementation of Alternative 3 are considered to be less than significant.

Alternative 3A: Wilshire BRT and Exposition LRT (MOS)

The Exposition LRT MOS component of Alternative 2 would terminate at the Venice/Washington Station. Given that the Wilshire LRT impacts have been disclosed above, and the MOS option of the Exposition LRT is only a shorter route of the full-length alternative, the hydrology and water quality impacts resulting from construction and operation of Alternative 3A would be similar to Alternative 3. No hydrology and water quality impacts would occur west of the Venice/Washington

Station, and no increased hydrology and water quality impacts would occur at the westernmost MOS station location. Impacts would be less than significant.

Maintenance Yard

Alternatives 1 through 3 (including the design options and the MOS options) would require storage and maintenance facilities. A new maintenance yard(s) would provide maintenance for both the BRT/Rapid Bus Systems and/or LRT system and, as such, must be centrally located to both systems (i.e., the downtown Los Angeles area). Section 2.0 (Alternatives Considered) provides a detailed description of the location of maintenance yard sites, including the screening process that was used to identify the six potentially feasible sites. In summary, the six maintenance yard sites that are currently being considered by the MTA include:

- NW Corner of Chavez/Mission;
- Existing MTA Division I Area;
- NE Corner Alameda/Washington;
- SE Corner Alameda/Washington;
- Exposition ROW Hooper to Central; and
- Existing MTA South Park Shops.

Figures 2-16 through 2-19 in Section 2.0 (Alternatives Considered) shows the locations and physical layout of the proposed maintenance facilities. These locations are all contained within lands currently owned and operated by the MTA, and are predominately located within industrial areas. The provision of maintenance facilities could result in water quality impacts. A source of contaminated water will be runoff from the maintenance yard where buses will be washed. Chemicals used for vehicle cleaning include solvents, detergents, and surfactants. The wash area will be constructed to drain into a designated collection area, where all effluents will be contained for treatment before discharge. The Industrial Waste Section of the Los Angeles County Sanitation Districts has evaluated Metro Rail's proposed rail carwashing system, which uses water recycling and water treatment through clarification. The Industrial Waste Section staff has concluded that the proposed system is appropriate and will meet existing and proposed water quality standards. Therefore, impacts related to storm water runoff and water quality (caused by operation of the maintenance facilities) would be considered less than significant. Furthermore, because the candidate maintenance facility sites are located within urbanized areas, no grading will be necessary. Therefore, there will be no increase in impervious surfaces, and no impacts related to flooding or groundwater resources are anticipated.

Subway Design Option at USC/Exposition Park (for Alternatives 2, 2A, 3, and 3A)

The subway design option would provide a subterranean travel corridor for either the bus or light rail alternatives of the Exposition Corridor in the USC/Exposition Park area. In order to implement this design option, MTA must apply for an NPDES permit prior to the start of construction. The NPDES permit would require the preparation and implementation of a SWPPP to control sediment and other construction-related pollutants from entering the storm drain system. This permit would list water quality standards and effluent limits set forth by the RWQCB to protect the beneficial uses of any receiving waters. In addition, this design option would also include a water treatment system during construction of the subway segment to collect surface, ground, and construction cleaning water prior to discharge in storm drains that empty into Ballona Creek. The treated water (effluent) would be regulated by the RWQCB under MTA's NDPES permit for the project, as well as all applicable Waste Discharge Regulations, and would be designed to remove contaminants to a level that meets the NPDES Permit requirements.

Construction activities associated with construction of the subway design option would also generate substantial levels of sediment, dust, and other construction-related pollutants, such as building materials and debris. Since construction surface water would be treated prior to release to sensitive receiving waters (such as Ballona Creek), no impacts to beneficial uses are anticipated. Furthermore, preparation of an SWPPP, as well as compliance with all requirements of the NPDES Program, including monitoring activities to assess the effectiveness of the Best Management Practices (BMPs), would ensure that a less than significant impact occurs with respect to water quality.

3.11.4 Cumulative Impacts

The 1998 RTP Draft Master EIR (SCAG, 1997), which is hereby incorporated by reference, provides the cumulative context for analysis of the Mid-City/Westside Transit Corridor Project. The 1998 RTP Draft Master EIR provides a programmatic analysis of hydrologic and water quality impacts resulting from implementation of all projects contemplated in the RTP (SCAG, 1998), including the Mid-City/Westside Transit Corridor project, and provides the basis for this cumulative impact analysis.

Cumulative hydrologic and water quality impacts could result from a degradation of water quality by roadway pollutants. Projects contemplated in the RTP that do not require the construction of new facilities (e.g., optimization of the existing transportation system) would not have a direct physical effect on water resources. The indirect effects of reducing traffic congestion would be beneficial to water quality in the region, because reductions in air emissions and accident-related roadway surface pollutants would reduce the level of water-borne pollutants that could migrate to surface and groundwater. Those projects that require construction of new or expanded facilities (e.g., new freeways or expanded roadways or additional parking facilities) would potentially have the greatest adverse impacts, because increased traffic-carrying capacity and increases in surface parking areas could cause increases in surface water pollutants related to tire wear, oil and grease, accident-related spills, and vehicle exhaust. In addition to pollutants that would result from normal roadway/freeway operations, trash, pesticides, and accidental spills of transported materials could contaminate adjacent water bodies. The effects of additional pollutant loadings of surface water could also produce localized impacts on water resources.

Construction-related erosion and sedimentation impacts could also result during clearing and grading operations, and from cut-and-fill slopes that are exposed prior to the establishment of landscaping. The alteration of drainage patterns at stream crossings could also change erosional processes, depending on the design of bridge supports or the use of culverts.

Lastly, to the extent that projects envisioned in the RTP would be built within the urbanized portions of the SCAG region, or within existing rights-of-way, such projects would cause minimal increases in impermeable surface area, and less-than-significant impacts related to flooding would occur.

Compliance with all applicable federal, state, and local laws and regulations pertaining to hydrology and water quality, including, but not limited, to Section 401 of the Clean Water Act (Water Quality Certification), Section 402 of the Clean Water Act (the National Pollutant Discharge Elimination System Program), Section 404 of the Clean Water Act (Department of the Army Permits), Section 1600 *et seq* of the Fish and Game Code of California, the Coastal Zone Management Act, as well as the Best Management Practices specified in SCAG's Areawide Waste Treatment Management Plan (208 Plan) would minimize the discharge of pollutants, reduce construction-related erosion and sedimentation, and would ensure that projects do not expose people or structures to flood-related hazards. Cumulative hydrology and water quality impacts associated with all of the project alternatives (i.e., No Action Alternative, TSM Alternative, and Alternatives 1, 2, and 3) would be less than significant.

3.12 Biological Resources

3.12.1 Introduction

Because of the urbanized and developed character of the Study Corridor, biological resources are not expected to be substantially or significantly affected by the proposed project alternatives. The discussion below outlines the primary biological resource impacts considerations in the corridor.

3.12.2 Affected Environment

The Study Area encompasses approximately 112 square miles. This area, however, is one of the most densely developed and urbanized areas in the southern California region. As a result, open space is largely limited to man-made parks and golf courses. With the exception of the Baldwin Hills, there are no natural open space areas within the Study Area. The only surface water body within the corridor area is Ballona Creek. The creek is maintained by the Los Angeles County Flood Control District as a flood channel and flows from east to west. The surface flow (consisting largely of urban runoff) is contained within a lined channel with the exception of the estuary area in Marina del Rey.

3.12.3 Impact Assessment and Mitigation Measures

Standards of Significance

It is expected that an adverse impact to biological resources would result if development of a transit system would:

- Result in a substantial adverse effect on any federally, state, or locally designated sensitive species, including threatened, endangered, or candidate species as identified by the United States Fish and Wildlife and Service and/or the California Department of Fish and Game;
- Result in a substantial adverse effect on riparian habitat or other sensitive natural communities;
- Remove or have an adverse affect on any federally protected wetlands;
- Interfere with the movement of any native or migratory fish or wildlife species;
- Conflict with local policies or ordinances protecting biological resources; or
- Conflict with the provisions of an adopted Habitat Conservation Plan (HCP).

Methodology for Impact Evaluation

The evaluation method for impacts to biological resources entails a review of the California Natural Diversity Data Base to determine whether there are threatened or endangered plant or animal species within the study area, and a comparison of the proposed alignment/route of the transit improvements to determine whether these improvements traverse sensitive ecological areas, including rivers and streams, wetlands, wildlife migratory corridors and/or habitat conservation areas. If an alignment is located within or adjacent to one of these areas, there is a potential for an adverse impact.

Impacts

According to a search of the California Natural Diversity Database (NDDB), there are no sensitive species within the areas affected by the proposed alternatives. The alternatives would not traverse any known wildlife migration corridors or any riparian habitats or wetlands. There are no HCP's that would be affected by the proposed alternatives.

No Action Alternative (Baseline)

As discussed in Section 2.0 (Alternatives Considered) of this report, the No Action Alternative would not entail physical changes to the corridor area, and would focus on operational bus improvements, such as an increase in fleet size. Buses would continue to operate along city streets and there would be no effects outside of these rights-of-way (ROWs). The No Action Alternative would result in less than significant impacts.

Transportation System Management (TSM) Alternative

Similar to the No Action Alternative, this option would focus on enhancements and restructuring of transit service within the corridor area. MTA local service buses as well as MTA Rapid Bus service would continue to operate along city streets and highways and there would be no effects outside of these ROWs. Impacts would be less than significant.

Alternative 1: Wilshire BRT (Baseline Median-Running)

The Wilshire BRT route would be limited to the ROW of Wilshire Boulevard. The transit improvement would require the removal of existing median trees in some segments. These trees are considered to have aesthetic rather than ecological value because of their isolated location within a narrow median of a heavily traveled street. In limited circumstances, the removal of median trees could adversely affect nesting birds. However, no species within the corridor are listed as threatened or endangered. Peregrine Falcons (listed by the California Department of Fish and Game) are known to forage within the West Los Angeles/Westwood area. These species typically nest at high elevations (including office towers) and it is extremely unlikely that the removal of median trees on Wilshire Boulevard would adversely affect this species. Refer to the visual impact analysis for a further discussion of the loss and replacement of median and street trees. Implementation of the mitigation measures identified in Section 3.7 (Visual Quality), such as those requiring additional landscaping, would result in less than significant impacts to street trees along the Wilshire BRT route.

Alternative 1A: Wilshire BRT (Median Adjacent Design Option)

Similar to Alternative 1, impacts are expected to be less than significant.

Alternative 1B: Wilshire BRT (Curb Adjacent Design Option)

Similar to Alternative 1, impacts are expected to be less than significant.

Alternative 2: Wilshire BRT and Exposition BRT (Full Length)

Similar to the Wilshire BRT (discussed above), the Exposition BRT option also follows existing public ROWs and is largely contained within existing limits of city streets or a former railroad ROW now owned by the MTA. Within the segment extending from Figueroa Street in the east to Farmdale Avenue on the west, a distance of approximately four miles, the route would require the removal of existing landscaping. Similar to the Wilshire route, this landscaping has more aesthetic than natural habitat value because of its isolated location within a street median or former railroad ROW. The Exposition BRT component would entail a crossing of Ballona Creek in east Culver City. This crossing would be accomplished on a new aerial structure at a point along Ballona Creek where the creek is in a concrete-lined flood control channel. Thus, it is not expected that the placement of columns or piers for the aerial structure in this location would affect the ecological value of the creek in any way. Impacts would be less than significant.

Alternative 2A: Wilshire BRT and Exposition BRT (MOS)

Similar to Alternative 2, impacts would be less than significant.

Alternative 3: Wilshire BRT and Exposition LRT (Full Length)

This alternative would have similar effects to the Wilshire BRT and Wilshire BRT/Exposition BRT alternative discussed above. The primary exception related to this option would be the removal of coral trees from the median of Olympic Boulevard in Santa Monica. The area affected would extend from approximately Cloverfield Boulevard to 10th Street. Over two dozen trees would be affected by the LRT alignment within a new median in Olympic Boulevard. The removal of these trees would likely affect micro-habitats for urban birds and other species. No nests of listed or endangered species would be affected. Similar to other areas, the loss of trees would have a greater visual and aesthetic impact than an effect on biological resources. See Section 3.7 for a further discussion of visual impacts.

Alternative 3A: Wilshire BRT and Exposition LRT (MOS)

Similar to Alternative 3, impacts would be less than significant.

Maintenance Yard

As discussed in Section 2 of this report, the MTA is considering candidate maintenance yard site locations for BRT operations. Six candidate sites are under consideration. Each of the sites is located in a developed and urbanized area near downtown Los Angeles. No impacts to biological resources would be expected from the construction and operation of maintenance yards at the candidate sites under consideration.

Subway Design Option at USC/Exposition Park (for Alternatives 2, 2A, 3 and 3A)

As discussed in Section 2, a design option is being considered in the Exposition Park area, where a tunnel would be constructed for either BRT or LRT in the area between Figueroa Street and Vermont Avenue. Although the tunnel would be constructed within campus and park type area. The area is highly urbanized and no threatened or endangered species are known to be located in the area. Thus, no significant biological resource impacts are expected from the tunnel design option.

Mitigation

None required.

3.12.4 Cumulative Impacts

Because there are no biological resources within the project area, no cumulative impacts are anticipated.

3.13 Energy Resources

3.13.1 Introduction

Generally, vehicles associated with transit development and improvements (i.e., buses and rail) consume energy. The discussion below illustrates the amount of energy expected to be consumed by the development of a transit system.

3.13.2 Affected Environment

The existing bus, urban rail, commuter rail, and automobiles consume a total of approximately 620,250 billion British thermal units (BTU)1 annually. Automobiles currently consume the most oil (approximately 105,243,547 barrels) and urban rail consumes the least amount of oil (approximately 53,485 barrels). Table 3.13-1 shows the existing amount of energy used annually for each vehicle class.

TABLE 3.13-1
ANNUAL ENERGY USAGE

Vehicle Class	Total BTU Consumption (Billions)	Total Barrels of Oil
Bus	9,158	1,578,968
Urban Rail	310	53,485
Commuter Rail	369	63,682
Automobiles	610,413	105,243,547
Annual Total	620,250	106,939,683

Source: Terry A. Hayes Associates, Manuel Padron & Associates.

3.13.3 Impact Assessment and Mitigation Measures

Standards of Significance

Direct energy consumption involves energy used by the operation of vehicles (automobile, truck, bus, or train) within the corridor. In assessing the direct energy impact, consideration was given to the following factors:

- Annual vehicle miles traveled (VMT) for automobiles, trucks, buses, and heavy rail vehicles;
- Variation of fuel consumption rates by vehicle type.

Methodology for Impact Evaluation

The direct energy analysis for each alternative was based on projected year 2020 corridor traffic volumes and the total VMT. The 2020 daily traffic volumes for the study corridor were provided by the MTA model and annualized based on transit statistics. The VMT fuel consumption method

1 One British thermal unit (BTU) is the quantity of energy necessary to raise one pound of water one degree Fahrenheit.

utilized for this project is outlined in the *Technical Guidance on Section 5309 New Starts Criteria* (Federal Transit Administration [FTA], 1999). Energy consumption factors for the various modes identified in Table 3.13-2 were developed by Oak Ridge Laboratory and published in the 1996 *Transportation Energy Book: Edition 16*.

TABLE 3.13-2 ENERGY CONSUMPTION FACTORS	
Mode	**Factor**
Passenger Vehicles (automobiles, vans, light trucks)	6,233 BTU/Vehicle Mile
Transit Bus (all vehicle types) /a/	41,655 BTU/Vehicle Mile
Rail (light or heavy)	77,739 BTU/Vehicle Mile
/a/ FTA recommends utilizing a transit bus energy consumption factor of 41.655 BTUs/VMT for all bus types (including alternative fueled buses). Sufficient data has not been available to develop consumption factors for alternative fuels such as CNG (compressed natural gas), LNG (liquefied natural gas), and others.	
BTU = British thermal unit.	
Source: Oak Ridge Laboratory, 1996.	

Direct energy, measured in BTU, was converted to the equivalent barrels of crude oil for comparison of alternatives. The change in annual BTUs was calculated for all alternatives.

Impacts

Change in regional energy consumption based on changes in VMT for each alternative is summarized in Table 3.13-3. Total annual VMT are anticipated to decrease under all alternatives when compared to the No Action Alternative. However, total VMT for the Wilshire BRT and Exposition LRT Alternative would decrease the most.

TABLE 3.13-3 CHANGE IN REGIONAL ENERGY CONSUMPTION – YEAR 2020					
	Passenger Vehicle	**CNG Bus**	**Light/Heavy Rail**	**Commuter Rail**	**Total Change**
TSM vs. No Action					
Change in VMT/Year	-2,468,399	189,937	-6,674	21,971	-2,263,215
Percent Change	-0.002%	0.08%	-0.07%	0.45%	-0.002%
Wilshire BRT vs. No Action					
Change in VMT/Year	-27,354,710	1,800,837	90,422	37,479	-25,425,972
Percent Change	-0.02%	0.77%	0.91%	0.74%	-0.02%
Wilshire BRT and Exposition BRT vs. No Action					
Change in VMT/Year	-43,702,396	2,750,881	191,765	34,575	-40,725,175
Percent Change	-0.03%	1.17%	1.92%	0.71%	-0.03%
Wilshire BRT and Exposition LRT vs. No Action					
Change in VMT/Year	-60,902,128	-735,645	1,669,839	-2,581	-59,970,515
Percent Change	-0.04%	-0.31%	16.72%	-0.05%	-0.04%

TABLE 3.13-3 CHANGE IN REGIONAL ENERGY CONSUMPTION – YEAR 2020					
	Passenger Vehicle	**CNG Bus**	**Light/Heavy Rail**	**Commuter Rail**	**Total Change**
Wilshire BRT vs. TSM					
Change in VMT/Year	-27,354,710	1,800,837	90,422	37,479	-23,162,757
Percent Change	-0.02%	0.68%	0.97%	0.32%	-0.02%
Wilshire BRT and Exposition BRT vs. TSM					
Change in VMT/Year	-41,233,947	2,560,944	198,439	12,604	-38,461,960
Percent Change	-0.03%	1.09%	1.99%	0.26%	-0.03%
Wilshire BRT and Exposition LRT vs. TSM					
Change in VMT/Year	-58,433,679	-925,582	1,676,513	-24,552	-57,707,300
Percent Change	-0.04%	-0.39%	16.80%	-0.50%	-0.04%
VMT = vehicle miles traveled.					
Source: Terry A. Hayes Associates, see FTA New Start Worksheets.					

Table 3.13-4 summarizes the amount of fuel each alternative consumes annually. Among all the alternatives being considered, the No Action Alternative is expected to consume the most oil, and the Wilshire BRT and Exposition BRT is anticipated to consume the least oil.

TABLE 3.13-4 ANNUAL FUEL CONSUMPTION						
			Change in Barrels of Oil Consumed vs. No Action		**Changes in Barrels of Oil Consumed vs. TSM**	
Alternative	**Total BTU Consumed (billions) /a/**	**Barrels of Oil**	**Barrels of Oil**	**Percent Change**	**Barrels of Oil**	**Percent Change**
No Action	894,086	154,152,740	N/A	N/A	N/A	N/A
TSM	894,080	154,151,741	-999	<-0.01%	N/A	N/A
Wilshire BRT	894,001	154,138,138	-14,602	-0.01%	-13,603	-0.01%
Wilshire BRT and Exposition BRT	893,946	154,128,698	-24,042	0.02%	-23,043	-0.01%
Wilshire BRT and Exposition LRT	893,805	154,104,345	-48,395	-0.03%	-47,396	-0.03%
/a/ BTU = British thermal unit.						
Source: Terry A. Hayes Associates, see FTA New Start Worksheets.						

No Action Alternative (Baseline)

Under the No Action Alternative, the annual VMT for automobiles and trucks within the region is forecasted to be approximately 141.7 billion miles in the year 2020. The annual VMT is anticipated to be approximately 235.5 million for CNG buses, 10 billion for light or heavy rail, and 4.9 million for commuter rail.

For the No Action Alternative, a total of approximately 154,152,740 barrels of oil, or approximately 894,086 billion BTU) is expected to be consumed within the region annually. The No Action

Alternative would consume the most oil among all the alternatives being considered. Impacts would be less than significant.

Transportation System Management (TSM) Alternative

The TSM Alternative would decrease annual passenger vehicle and light/heavy rail VMT by approximately 0.002 and 0.07 percent, respectively, when compared to the No Action Alternative. However, annual CNG bus and commuter rail VMT is anticipated to increase by approximately 0.08 and 0.45 percent, respectively. Overall, the TSM Alternative would reduce total annual VMT by approximately 2,263,215 miles, or 0.002 percent, when compared to the No Action Alternative. Among all the alternatives being considered, the TSM Alternative will conserve the least amount of energy when compared to the No Action Alternative.

A total of approximately 154,151,741 barrels of oil is expected to be consumed under the TSM Alternative annually. Generally, oil consumed under the TSM Alternative is anticipated to decrease by less than 0.01 percent per year when compared to the No Action Alternative. Similar to the No Action Alternative, impacts would be less than significant.

Alternative 1: Wilshire BRT (Baseline Median-Running)

Annual passenger vehicle VMT for the Wilshire BRT is anticipated to decrease by approximately 0.02 percent when compared to the No Action Alternative and the TSM Alternative. However, annual VMT for CNG buses, light/heavy rail, and commuter rail is expected to increase by approximately 0.77, 0.91, and 0.74 percent, respectively, when compared to the No Action Alternative. When compared to the TSM Alternative, annual VMT for CNG buses, light/heavy rail, and commuter rail is anticipated to increase by approximately 0.68, 0.97, and 0.32 percent, respectively. Overall, total VMT is expected to decrease by approximately 0.02 percent per year when compared to both the No Action Alternative and the TSM Alternative.

Vehicles operating within the region are anticipated to consume a total of approximately 154,138,138 barrels of oil, or approximately 894,001 billion BTU, per year. Fuel consumption under this alternative is approximately 0.01 percent less than both the No Action Alternative and the TSM Alternative. Impacts would be beneficial.

Alternative 1A: Wilshire BRT (Median Adjacent)

Impacts would be similar to Alternative 1 discussed above. Beneficial impacts would occur.

Alternative 1B: Wilshire BRT (Curb Adjacent Design Option)

Impacts would be similar to Alternative 1 discussed above. Beneficial impacts would occur.

Alternative 2: Wilshire BRT and Exposition BRT (Full Length)

Annual passenger vehicle VMT for the Wilshire BRT and Exposition BRT is anticipated to decrease by approximately 0.03 percent when compared to the No Action Alternative and the TSM Alternative. However, annual VMT for CNG buses, light/heavy rail, and commuter rail is expected to increase by approximately 1.17, 1.92, and 0.71 percent, respectively, when compared to the No Action Alternative. When compared to the TSM Alternative, annual VMT for CNG buses, light/heavy rail, and commuter rail is anticipated to increase by approximately 1.09, 1.99, and 0.26 percent, respectively. Overall, total VMT is expected to decrease by approximately 0.03 percent per year when compared to both the No Action Alternative and the TSM Alternative.

Under the Wilshire BRT and Exposition BRT, vehicles operating within the region are anticipated to consume a total of approximately 154,128,698 barrels of oil, or approximately 893,946 billion BTU, per year. Fuel consumption under this alternative is approximately 0.02 percent less than the No Action Alternative, and approximately 0.01 percent less than the TSM Alternative. Among all the alternatives being considered, the Wilshire BRT and Exposition BRT would consume the least amount of oil. Impacts would be beneficial.

Alternative 2A: Wilshire BRT and Exposition BRT (MOS)

Impacts would be similar to alternative 2. Beneficial impacts would occur.

Alternative 3: Wilshire BRT and Exposition LRT (Full Length)

Of the three build alternatives, the Wilshire BRT and Exposition LRT will have the highest increase in light/heavy rail VMT (16.72 percent annual increase over the No Action Alternative and 16.80 percent annual increase over the TSM Alternative). With the exception of light/heavy rail VMT, annual VMT for passenger vehicle, CNG bus, and commuter rail are anticipated to decrease. Among all the alternatives being considered, the Wilshire BRT and Exposition LRT would have the smallest annual VMT (0.04 percent less than both the No Action Alternative and the TSM Alternative).

Under the Wilshire BRT and Exposition LRT Alternative, vehicles operating within the region are anticipated to consume a total of approximately 154,104,345 barrels of oil, or approximately 893,805 billion BTU, per year. Fuel consumed under this alternative is approximately 0.03 percent less than the No Action Alternative, and approximately 0.03 percent less than the TSM Alternative. Impacts would be beneficial.

Alternative 3A: Wilshire BRT and Exposition LRT (MOS)

Impacts would be similar to alternative 2. Beneficial impacts would occur.

Maintenance Yard

As discussed in Section 2 of this report, the MTA is considering candidate maintenance yard site locations for BRT operations. With the exception of the South Park Shops, the remaining five candidate sites would be located in proximity to the Wilshire BRT route and would have minimal service miles to the maintenance yard. The service miles to the South Park Shops would be about 2 times greater than the average service miles from the other candidate yard site locations.

In terms of construction-related energy consumption, the existing MTA owned sites (Alameda and 6th, South Park Shops) would likely require the least amount of site work and energy consumption. Of the four remaining sites that would require demolition and new construction, the Chavez and Mission site would have the greatest energy consumption due to extensive amount of site work needed to level the site. The remaining sites such as Washington and Alameda Northeast, Washington and Alameda Southeast, Exposition ROW, would require minimal energy for site clearance and construction. Impacts would be less than significant.

Subway Design Option at USC/Exposition Park (for Alternatives 2, 2A, 3 and 3A)

The option to construct a tunnel approximately 40 feet deep and ½ mile long would require more energy resources than the primary option of constructing the BRT or LRT facilities at grade. The primary source of additional energy consumption would result from the use of earthmoving equipment for construction subway design option, as well as the extensive amount of haul trucks and haul truck travel to spoil sites to remove the excavated earthwork. The additional energy consumption required for this option would not result in a significant impact.

Mitigation

3.13-1 - The LACMTA through its vehicle procurement policy shall specify energy efficiency specifications for the double-articulated bus to be purchased and operated on the BRT routes.

3.13-2 - The LACMTA through plans and specifications shall ensure that stations and other elements of the BRT or LRT infrastructure use the most energy efficient designs and equipment.

3.13-3 – The LACMTA shall select a maintenance yard location that minimizes bus travel and minimizes the amount of site work necessary to construct the maintenance facility.

3.13.4 Cumulative Impacts

The energy consumption statistics and comparisons presented in this section represent the net effect on regional travel from the various alternatives, and represent cumulative incremental changes in the region. Although there are currently regional power supply disruptions in the marketplace due to deregulation of electricity providers in California, the majority of the project study area is served by the Los Angeles Department of Water and Power which has not experienced shortages. Significant cumulative impacts are not anticipated.

3.14 Safety and Security

3.14.1 Introduction

The purpose of this section is to characterize existing and future safety and security issues for passengers, pedestrians, motorists, and the surrounding community. This section will identify any potentially significant safety and security impacts that could occur due to the introduction of transit improvements into the Mid-City/Westside Transit Corridor. Various schools and parks are located within a ¼ of a mile of both the Wilshire and Exposition corridors (See discussion in Chapter 3.15 dealing with Community Facilities). Of concern is the potential for pedestrian/motorist conflict. Safety issues include station accidents, boarding and disembarking accidents, and right-of-way accidents. The impact on pedestrian and motorist safety in relation to those environments are considered below. Another aspect of the safety question is security, particularly whether transit station and/or parking design, location, layout would compromise the safety of transit patrons or surrounding communities making them more susceptible to criminal activity.

3.14.2 Affected Environment

Wilshire Boulevard is classified as a major arterial. As discussed in the Land Use portion of this report, Wilshire Boulevard is located within the most densely developed corridor in the Los Angeles region. For the project under consideration, Wilshire extends from Western Avenue in Los Angeles to downtown Santa Monica for a distance of 13.2 miles. The corridor is located in a dense urban environment with high volumes of pedestrian and motorist activity. Pedestrian activity is particularly high in the Wilshire Center area, Miracle Mile, downtown Beverly Hills, Westwood, West Los Angeles and in Santa Monica.

Between Western Avenue and 2nd Street in downtown Santa Monica, 90 signalized intersections are present. In addition, 40 legal pedestrian crossings that are not equipped with traffic signals exist along this corridor. A majority of the unsignalized crosswalks are unmarked. Pedestrians can legally cross a street at any signalized or unsignalized crosswalk, or at an unmarked crosswalk at an intersection. In this regard, available comparative accident statistics shows that the intersections along Wilshire Boulevard (within the project area) is not among the 50 highest accident intersection locations within the City of Los Angeles.

The Exposition corridor is comprised of approximately 17 miles. Proposed operations would occur largely within the MTA-owned (former railroad) right-of-way along Exposition Boulevard from downtown Los Angeles to downtown Santa Monica. Other portions of the corridor include use of such streets as Figueroa or Hill Street at the eastern and Venice Boulevard, Sepulveda, Olympic and Colorado Boulevard in the western portion of the corridor. These streets are also major arteries but they do not carry the level of traffic volume as Wilshire Boulevard nor do they have the same high level of pedestrian sidewalk activity.

The existing transportation right-of-way was purchased by the MTA from the Southern Pacific Railroad Company in the early 1990's to provide high capacity transit service to the Westside. The alignment is primarily surrounded by residential land use along the core of the alignment, with retail and commercial development at both ends. Along the full Exposition alignment there are 38 existing signalized intersections. There are also a large number of unsignalized local street crossings.

Existing Procedures

The MTA oversees the operation of bus and light rail transit services throughout Los Angeles County. The MTA is also responsible for implementing it own *System Safety Program Plan* to maintain and improve the safety of commuter operations, reduce the costs associated with accidents and comply with state regulations. These safety measures were established to provide worker and passenger safety, crime prevention, adequate emergency response, and emergency procedures following natural disasters. Furthermore, the MTA currently provides police surveillance, non-uniformed police inspectors on transit and at major transit nodes, closed circuit television, and an emergency radio system to provide quick response to emergencies.

Over the last 10 years the MTA has established several projects to enhance the safety of the passengers, employees and the community. These projects include:

- Photo equipment has been installed on buses, permitting live video to be observed, to increase the safety of the passengers and employees.
- Direct communication services on the buses with the Los Angeles Police Department or the Los Angeles Sheriffs Department Transit Dispatch/Emergency Response Center.
- The Transit Safety Awareness Program communicates safety information to motorists and pedestrians in an attempt to change unsafe behaviors. Safety information is communicated through transit user aids such as timetables and bus stop information signs and via the internet.
- MTA personnel are offered Community Emergency Response training (CERT) in collaboration with the Los Angeles City Fire Department. Employees are trained in earthquake awareness, disaster medical procedures, and rescue operations.
- Four quadrant gates have been installed at highway-LRT grade crossings to deter motorists from driving around the lowered gates.
- Pedestrian swing gates and pedestrian automatic gates have been installed at pedestrian crossings of the LRT trackway, to control pedestrian movement.
- Photo enforcement of grade crossing violations has been installed at various crossings along the Blue Line to discourage motorists from driving around the lowered gate arms.

The design of existing bus and rail facilities (including vehicles, stations, parking lots, etc.) provides a safe, secure, and comfortable transit system. Transit patrons along the Wilshire and Exposition alignments would be provided with station and platform amenities such as covered waiting platforms and secure lighting. In addition, the MTA is including amenities specifically designed for the project. Some of these include Advanced Traveler Information Systems (ATIS), bike lockers, map cases and weather-resistant ticket vending machines. Security related design features include emergency telephones, public announcement (PA) systems, and closed circuit monitoring systems. Landscaping and public art would also be incorporated into the project design.

The primary concern regarding security is the environment into which the transit improvements will be introduced. The addition of increased pedestrian levels and activity at transit stations raises the potential for security related problems that must be handled by either MTA security personnel or affect local police departments. In this context, the Mid-City/Westside Transit Corridor is served by police departments in the City of Los Angeles, Culver City, Beverly Hills and Santa Monica (refer to Figure 3.14-1). Key characteristics of these departments are as follows. The transit system is served in large part by MTA Security. The MTA maintains a security force with a staff of 94 security officers and 10 administrative staff. The MTA security is authorized to carry weapons. MTA security jurisdiction includes MTA properties and/or events. Primary duties include revenue pickup and MTA light rail station patrol (Blue and Green Line). Local law enforcement (local police departments and L.A. County Sheriffs) provides all other security related functions.[1]

- The Los Angeles Police Department is divided into four bureaus, which are then broken down into divisions. The proposed project area extends through six LAPD Divisions (Pacific, West Los Angeles, Wilshire, Newton, Rampart and Southwest).
- The Southwest Community Police Station covers approximately 9.8 square miles and serves a population of 165,000. Located in the South Bureau this division employs 355 sworn officers and 27 civilian personnel. The Exposition corridor falls within this division.
- Rampart Division in the Central Bureau serves the Wilshire corridor. This division encompasses 8.0 square mile area and serves a population of 375,000 people. This station employs 368 sworn officers and 33 civilians.
- Newton Community Police Station serves 9.0 square miles and a population of approximately 150,000 people. This station employs 294 sworn officers and 26 civilians.
- The Wilshire Community Police Station is comprised 14.5 square miles and has a population of nearly 233,000 residents and is under the jurisdiction of the West Bureau. This station employs 400 sworn officers and 28 civilian staff members.
- The West Los Angeles Division, which is located in the West Bureau, encompasses 65 square miles and serves over 215,000 residents. The Wilshire Corridor falls within the West Los Angeles Division Jurisdiction. This station employs 276 sworn officers and 25 civilians.
- The Pacific Division, which is located in the West Bureau and encompasses 24.1 square miles and serves over 200,000 residents. The Exposition corridor falls within the Pacific Division Jurisdiction. The Pacific Division employs 296 sworn officers and 31 civilians.
- Culver City Department serves the Exposition Corridor. This Police Department employs 124 sworn officers and 200 civilian staff members. The Culver City Police Department serves a population of approximately 38,793.
- Beverly Hills Police Department serves the Wilshire Corridor has 134 sworn officers and 62 civilian personnel. Beverly Hills has a population of approximately 33,700.

[1] 10/21/2000 conversation with MTA Systems Security Manager, Pamela Murano.

Figure 3.14-1: Police Service Areas

- The Wilshire and Exposition Corridors are served by the Santa Monica Police Department. With 196 sworn officers and 238 civilian employees this police department serves a population of approximately 96,528.

Table 3.14-1 illustrates the relative Part I crime rates and response times within the corridor. Part I Crimes include homicide, rape, aggravated assault, robbery, burglary, larceny, and vehicle theft. The data broadly suggest that the crime rate may be slightly higher in the southern portion of the transit corridor.

TABLE 3.14-1
PART I CRIME RATE AND RESPONSE TIME (YEAR 1999)

	Part I Offenses	Crime Rate (Part I offenses Per 1000 Population)	Average Response Time (minutes)
Santa Monica Police Department	4884	50.6	4.92
Culver City Police Department	1,446	37.2	3
Beverly Hills Police Department	1549	46.0	3.5
Los Angeles Police Department			
Pacific	10996	72.1	9.5
West Los Angeles	6731	22.4	10.4
Wilshire	12453	40.6	9.3
Newton	8257	60.6	9.1
Rampart	9677	52.0	9.4
Southwest	11255	56.6	9.5

In addition to crimes reported for the general population by the local police, statistics are also maintained for the MTA operations. Specifically, the Blue Line and Green Line are under the jurisdiction of the Los Angeles County Sheriff's Department. According to the Transit Services Bureau operated by the Los Angeles County Sheriff's Department4,403 incidents were reported for the 1999 year (1,281 for Metrolink and 2,913 for MTA). Of the total reported 391 of the crimes (8%) were Part I Crimes. Statistics as reported by the Los Angeles Police Department for transit crimes 2,208 offenses were reported for 1999.

3.14.3 Impact Assessment and Mitigation Measures

Standards of Significance

Appendix G of the State CEQA Guidelines draws particular attention to those projects which would "create a potential public health hazard," or "interfere with emergency response plans or emergency evacuation plans." Project effects on safety and security would normally be considered significant under CEQA if they:

- Cause or create the potential for substantial adverse safety conditions, including: station accidents, boarding and disembarking accidents, right-of-way accidents, collisions, and fires, and major structural failures; or substantially limit the delivery of community safety services, such as police, fir, or emergency services;
- Cause or create the potential for substantial adverse security conditions, including: incidents, offenses, and crimes; or
- Substantially interfere with the implementation of an emergency evacuation plan.

Methodology for Impact Evaluation

Pedestrian and motorist safety along the alternatives considered in this document are evaluated on a qualitative level based on the experience of LRT systems throughout North America with similar alignment types. In addition, pedestrian safety along the BRT alignments were evaluated based on the experience gained from LRT alignments in North America due to the similarities in alignment type and operation. Research conducted on pedestrian and motorist safety referenced in this section include *Transit Cooperative Research Program (TCRP) Report 17 – Integration of Light Rail Transit into City Streets*, *TCRP Project A-13 – Light Rail Service: Vehicular and Pedestrian Safety*, and *National Urban Transit Institute, At-Grade Busway Planning Guide.*

Safety Impacts

No Action Alternative (Baseline)

With the no project alternative, it is assumed that improvements will not be made to any of the pedestrian crossings. Based on existing trends, the number of pedestrian collisions at crosswalks may increase with the increase in vehicular volume on the Wilshire and Exposition corridors. This increase is a result of increased exposure between pedestrians and vehicles at intersections and pedestrian only crossings. Along the Wilshire corridor, under the No Project Alternative, the existing 90 signalized intersections will remain as well as the 40 legal pedestrian crossings, many of which are unmarked. Pedestrians can legally cross a street at any signalized or unsignalized crosswalk, or at an intersection with an unmarked crosswalk.

Under the No Project Alternative, student safety along the Wilshire and Exposition alignments would remain similar to current conditions. There may be an increase in student- involved collisions along the two corridors due to the increase in exposure caused by increased traffic volumes.

Under the No Project Alternative, safety at crossings near parks along the Wilshire and Exposition alignments would remain similar to current conditions. There may be an increase in pedestrian involved collisions along the two corridors due to the increase in exposure caused by increased traffic volumes. Impacts would be less than significant.

Transportation System Management (TSM) Alternative

With a TSM alternative the number of collisions involving pedestrians may increase with the increase in vehicular volume on the Wilshire and Exposition corridors. Similar to the No Action Alternative, the TSM alternative does not provide improvements to the existing pedestrian crossings in the study area. Along the Wilshire corridor, under the TSM Alternative, the existing 90 signalized intersections will remain as well as the 40 legal pedestrian crossings, many of which are unmarked.

Under the Transportation System Management Alternative, student safety along the Wilshire and Exposition alignments would remain similar to current conditions. There may be an increase in student-involved collisions along the two corridors due to the increase in exposure caused by increased traffic volumes.

Under the Transportation System Management Alternative, safety at crossings near parks along the Wilshire and Exposition alignments would remain similar to current conditions. There may be an increase in pedestrian involved collisions along the two corridors due to the increase in exposure caused by increased traffic volumes. Impacts would be less than significant.

<u>Alternative 1: Wilshire BRT (Baseline Median-Running)</u>

Pedestrian safety at existing intersections would be affected by the addition of a new BRT right-of-way. Pedestrian safety is improved by encouraging the use of well marked crosswalks at signalized locations. Pedestrian crossings of the busway along the Wilshire BRT alignment will be controlled by pedestrian signals. Existing unsignalized pedestrian crossings of Wilshire Boulevard in Santa Monica will be signalized to provide an improved level of safety for pedestrians. Along the Wilshire corridor with the Wilshire BRT Alternative, 50 new traffic signals will be installed to provide a total of 139 signalized intersections and 4 pedestrian only signalized crossings.

Pedestrian safety at highway-BRT at grade crossings focuses on the ability of a pedestrian to determine that a bus is approaching, and proceed to a safe location when the bus passes. Pedestrian "Walk/Don't Walk" signals will be installed at all of the pedestrian crosswalks that cross the busway. The crosswalks could also be equipped with an active "Bus Coming Icon" to warn pedestrians of the presence of an approaching bus. The stations will be designed to allow for a pedestrian refuge area between the exclusive busway and general roadway. If pedestrian signals are actuated, the pedestrian refuge will be equipped with a pedestrian push button to allow pedestrians to clear off the platform.

The installation of pedestrian signals at crosswalks that are not currently signalized will increase the level of safety at the crosswalks. Pedestrians can legally cross a street at any signalized or unsignalized crosswalk, or at an intersection with an unmarked crosswalk. Along the Wilshire corridor with the Wilshire BRT alternative, the number of legal crosswalks will not be reduced. Also, due to the installation of 50 new traffic signals, the level of pedestrian safety along the Wilshire corridor will be greater with the Wilshire BRT Alternative than in the No Build Alternative.

Along the Wilshire BRT alignment 18 schools exist within ½ mile of the corridor. Thirty-six (36) new traffic signals will be installed within ½ mile of a school along the Wilshire BRT alignment. All of the traffic signals will be equipped with pedestrian signals. The additional signalized pedestrian crossings of Wilshire Boulevard will increase pedestrian safety along the alignment.

Along the Wilshire BRT alignment 12 parks exist within ½ mile of the corridor. Twenty-eight (28) new traffic signals will be installed within ½ mile of a park along the Wilshire BRT alignment. All of the traffic signals will be equipped with pedestrian signals. The additional signalized pedestrian crossings of Wilshire Boulevard will increase pedestrian safety along the alignment.

Impacts would be significant at unsignalized crosswalks and in any locations where the station median platforms are too small to accommodate pedestrian queues. Safety impacts would be less than significant for motorists.

Mitigation Measures 3.14-1 through 3.14-4 would ensure that less-than-significant impacts, and even beneficial impacts, occur with respect to Alternative 1:

- *Mitigation Measure 3.14-1:* All pedestrian crossings along the Wilshire BRT route shall be signalized. Appropriate signage will be installed clearly indicating correct methods to cross.

- *Mitigation Measure 3.14-2:* All station areas shall be lighted to provide a safe environment and visibility of the station platform and parking areas from adjacent land uses.
- *Mitigation Measure 3.14-3:* For all schools and parks within one-half mile of the transit alignment, the LACMTA shall sponsor a pedestrian safety education program, explaining acceptable methods to cross the guideway lanes.
- *Mitigation Measure 3.14-4:* In all mixed flow sections of the route, where transit vehicles will operate in street traffic, appropriate warning signs shall be installed making drivers aware of the condition, particularly in those segments where LRT vehicles will operate in mixed traffic.

Implementation of Mitigation Measures 3.14-1 through 3.14-4 will ensure a less than significant impact (with respect to motorists) or beneficial impact (with respect to pedestrians) would occur.

Alternative 1A: Wilshire BRT (Median Adjacent Design Option)

Many of the same safety concerns for motorists described for the Wilshire BRT Median Reconstruction Baseline (Alternative 1) are also applicable for the Wilshire BRT Median Adjacent Design Option. The main difference from the standpoint of motorist safety is the location of the interface between the motorist and the BRT. In this alternative, a motorist intending to make a left turn must first merge into the BRT lane and then merge into the exclusive left turn lane, all in one movement. This alignment moves the conflict point between the motorist and the BRT from the signalized intersection, to the approach lanes, where the movement is not controlled. Although conducting a lane change is generally not considered a high risk movement, the motorist must cross the BRT lane into the exclusive left turn lane at a speed that may be slower than the speed of the BRT (approaching from behind). This difference in speed may cause the motorist to misjudge the speed of the BRT approaching from behind and create a potentially hazardous situation and a potentially significant safety impact. However, implementation of Mitigation Measures 3.14-1 through 3.14-4 will ensure that a less-than-significant impact (with respect to motorists) or a beneficial impact (with respect to pedestrians) would occur.

Alternative 1B: Wilshire BRT (Curb Adjacent Design Option)

Many of the same safety concerns for motorists described for the Wilshire BRT Median Reconstruction Baseline (Alternative 1) are also applicable for the Wilshire BRT Curb Adjacent Design Option. The main difference from the standpoint of motorist safety is the location of the interface between the motorist and the BRT. This alternative eliminates the possibility of a left turning motorist becoming involved in a collision with a bus approaching from behind. However, in this alternative, a motorist making a right turn has an additional conflict to consider prior to conducting the right turn. The motorist must turn into and drive in the exclusive BRT lane in order to turn right. This movement is generally not considered a high risk movement, as the motorist should have adequate visibility of a bus approaching on the right. However, the bus will be required to yield the right of way to a motorist making a right turn in the exclusive bus lane. Impacts would be less than significant (with respect to motorists) and beneficial (with respect to pedestrians).

Alternative 2: Wilshire BRT and Exposition BRT (Full Length)

In addition to the safety impact for the Wilshire BRT alternative, discussed previously, the introduction of BRT along the Exposition corridor will have various safety impacts. The alignment type and operational characteristics of the BRT in a semi-exclusive right of way creates a situation similar to light rail transit. The Exposition BRT line utilizes a similar alignment to that of the Exposition LRT and has similar operating parameters. As such, many of the safety treatments utilized for the Exposition LRT alignment can also be utilized for the Exposition BRT alignment. However, some differences do exist. The use of automatic gates at BRT crossings has not been attempted in the United States, and may require special legislation in order to install the devices.

Also, in order to detect the bus to allow for full preemption of the traffic signal and to lower the automatic gates, BRT detection must be used. Trains have this detection feature built into the tracks, but buses do not have that option. Inductive loops may be the favorable solution, but they must have a built in redundant system to provide a fail-safe grade crossing. As such, if the loops malfunction, the gates lower, not allowing motorist or pedestrians to enter the crossing. A fail-safe design is necessary when using gates, because the BRT operator is not expecting to stop at the crossing.

Another factor that must be addressed with the use of gates at grade crossings is the frequency at which the bus arrives at the crossing. It can take from 40-60 seconds for a bus to clear a grade crossing, including the time required to call and lower the gates, pass through the crossing, and raise the gates after the bus has passed. As such, if the headway for the BRT is too small, the cross street traffic could be adversely affected, resulting in a potentially significant impacts. A possible solution for this is to platoon the buses through the grade crossings that are gate controlled, so that the total delay for the cross street is minimized.

In addition to the impact on student safety of the Wilshire BRT alignment, the Exposition BRT alignment will also have a positive impact on student safety. Twenty-two (22) schools exist within ½ mile of the Exposition BRT alignment, 13 of which are in the Exposition BRT MOS. Along the Exposition BRT alignment, 13 new traffic signals will be installed within ½ mile of the existing schools. Along the Exposition BRT MOS, 4 new traffic signals will be installed within ½ mile of an existing school. All of the traffic signals will be equipped with pedestrian signals. The additional signalized pedestrian crossings of Wilshire Boulevard and the Exposition right-of-way will increase pedestrian safety along the alignment.

Another factor to be considered with the introduction of the Exposition BRT is trespassing along the BRT right-of-way. Because the BRT will be traveling at speeds up to 55 mph, trespassing along the right-of-way is a primary concern. Fencing will be provided on the outside of the busway at all locations where the BRT exceeds 35 mph. In addition, at designated pedestrian crossings along the side-running alignment of the BRT located within a school zone, pedestrian automatic gates may be utilized to increase student safety. A pedestrian automatic gate is configured and operates much in the same manner as a vehicular gate, blocking the pedestrian approach in the presence of a bus.

In addition to the impact on pedestrian safety near parks along the Wilshire BRT alignment, the Exposition BRT alignment will also have a positive impact on pedestrian safety. Thirteen (13) parks exist within ½ mile of the Exposition BRT alignment, 8 of which are in the Exposition BRT MOS. Along the Exposition BRT alignment, 10 new traffic signals will be installed within ½ mile of the existing parks. Along the Exposition BRT MOS, 3 new traffic signals will be installed within ½ mile of an existing park. All of the traffic signals will be equipped with pedestrian signals. The additional signalized pedestrian crossings of Wilshire Boulevard and the Exposition right-of-way will increase pedestrian safety along the alignment.

Implementation of Mitigation Measures 3.14-5 through 3.14-9 will ensure that less than significant impacts occur:

- *Mitigation Measure 3.14-5:* In the vicinity of all schools along the Exposition alignment, pedestrian crossing gates shall be installed.
- *Mitigation Measure 3.14-6:* All station areas shall be lighted to provide a safe environment and visibility of the station platform and parking areas from adjacent land uses.
- *Mitigation Measure 3.14-7:* For all schools and parks within one-half mile of the transit alignment, the LACMTA shall sponsor a pedestrian safety education program, explaining acceptable methods to cross the guideway lanes.
- *Mitigation Measure 3.14-8:* In all mixed flow sections of the route, where transit vehicles will operate in street traffic, appropriate warning signs shall be installed making drivers aware of the condition.
- *Mitigation Measure 3.14-9:* All stations will be equipped with monitoring equipment and/or be monitored by LACMTA security personnel on a regular periodic basis.

Alternative 2A: Wilshire BRT and Exposition BRT (MOS)

Impacts would be similar to the Alternative 2. The MOS would include the portion of the corridor that contains the greatest concentration of schools and parks that would generate safety concerns.

Alternative 3: Wilshire BRT and Exposition LRT (Full Length)

In addition to the safety impact for the Wilshire BRT alternative, discussed previously, the introduction of LRT along the Exposition corridor will have various safety impacts. A review of data from prior research, safety oversight authorities and direct surveys of LRT system staff in the western United States conducted in recent years reveals that LRV-pedestrian collisions are divided into two general location types. The first location type, at station platforms, represents the largest percentage of LRV-pedestrian collisions. This high percentage may be attributed to the inherent purpose of a station, where large numbers of people converge near light rail vehicles, and cross the trackway. Many collisions at stations are also easily preventable, through safe design, appropriate signage and public education to encourage safe behavior. The second location type is along the LRT right-of-way, away from the stations. This location type includes paths to stations, such as crossings at intersections where pedestrians cross over the light rail tracks, and right of way intrusion (trespassing).

Although the low number and unique circumstances of historic pedestrian collisions do not allow a valid quantitative projection for the Exposition LRT alignment, some trends are present in the background data of collision causes. For example, pedestrians standing too close to the edge of the platform as a light rail vehicle approaches, represent a large number of LRV-pedestrian collisions at stations. In addition, intoxicated pedestrians represent a large percentage of the collisions. Furthermore, LRV-pedestrian collisions at crossings are typically the result of pedestrians proceeding without waiting for a green signal to walk.

Achieving a low number of pedestrian involved collisions with LRV is a result of several conditions including safety orientated design, light rail operator training, train speeds, and public education that warns pedestrians of potential hazards involved with light rail transit.

Pedestrian safety at LRT grade crossings is a potentially significant impact that can be addressed through safety treatments. Signs that warn pedestrians to "Look Both Ways" and display a train icon can be placed at the grade crossing. In addition, pedestrian channelization can direct pedestrians to designated crossing locations. Pedestrian channelization controls pedestrian movement through the use of paving, delineation, and barriers. Another pedestrian treatment that will be utilized along the Exposition alignment is the use of tactile warning strips. Traditionally used at stations to warn pedestrians of the edge of the platform, tactile warning strips will be installed at all designated pedestrian crossings of the trackway where the LRT alignment is not in the median of the roadway. Tactile warning strips assist the visually impaired and also provide a visual warning of the dynamic envelope of the train.

Along the Exposition alignment there are 38 existing traffic signals. The introduction of LRT will provide 14 additional signalized intersections. In addition, nine legal pedestrian crossings that were unsignalized prior to the introduction of LRT will be closed, as the intersection will only allow for right turns into or out of the cross street. The reduced number of legal crosswalks will require pedestrians to walk longer distances to cross streets, but will allow for a greater degree of protection for pedestrians at designated crosswalks due to the installation of traffic signals.

The alignment type and operational characteristics of the LRT in a semi-exclusive right of way creates a situation similar to the Exposition BRT alternative described above. In addition to the impact on student safety of the Wilshire BRT alignment, the Exposition LRT alignment will also have a positive impact on student safety. Twenty-two (22) schools exist within ½ mile of the Exposition LRT alignment, 13 of which are in the Exposition LRT MOS. Along the Exposition LRT alignment, 13 new traffic signals will be installed within ½ mile of the existing schools. Along the Exposition LRT MOS, 4 new traffic signals will be installed within ½ mile of an existing school. All of the traffic signals will be equipped with pedestrian signals. The additional signalized pedestrian crossings of Wilshire Boulevard and the Exposition right-of-way will increase pedestrian safety along the alignment.

Another factor to be considered with the introduction of the Exposition LRT is trespassing along the LRT right-of-way. Because the LRT will be traveling at speeds up to 55 mph, trespassing along the right-of-way is a primary concern. Fencing will be provided on the outside of the trackway at all locations where the LRT exceeds 35 mph. In addition, at designated pedestrian crossings along the side-running alignment of the LRT located within a school zone, pedestrian automatic gates may be utilized to increase student safety. A pedestrian automatic gate is configured and operates much in the same manner as a vehicular gate, blocking the pedestrian approach in the presence of a train.

The alignment type and operational characteristics of the LRT in a semi-exclusive right of way creates a situation similar to the Exposition BRT alternative described above. In addition to the impact on pedestrian safety near parks along the Wilshire BRT alignment, the Exposition LRT alignment will also have a positive impact on pedestrian safety. Thirteen (13) parks exist within ½ mile of the Exposition BRT alignment, 8 of which are in the Exposition LRT MOS. Along the Exposition LRT alignment, 10 new traffic signals will be installed within ½ mile of the existing parks. Along the Exposition LRT MOS, 3 new traffic signals will be installed within ½ mile of an existing park. All of the traffic signals will be equipped with pedestrian signals. The additional signalized pedestrian crossings of Wilshire Boulevard and the Exposition right-of-way will increase pedestrian safety along the alignment.

Implementation of Mitigation Measures 3.14-10 through 3.10-14 will ensure that less-than-significant impacts occur:

- *Mitigation Measure 3.14-10:* In the vicinity of all schools along the Exposition alignment, pedestrian crossing gates shall be installed.
- *Mitigation Measure 3.14-11:* All station areas shall be lighted to provide a safe environment and visibility of the station platform and parking areas from adjacent land uses.
- *Mitigation Measure 3.14-12:* For all schools and parks within one-half mile of the transit alignment, the LACMTA shall sponsor a pedestrian safety education program, explaining acceptable methods to cross the guideway lanes.
- *Mitigation Measure 3.14-13:* In all mixed flow sections of the route, where transit vehicles will operate in street traffic, appropriate warning signs shall be installed making drivers aware of the condition, particularly in those segments where LRT vehicles will operate in mixed traffic.
- *Mitigation Measure 3.14-14:* All stations will be equipped with monitoring equipment and/or be monitored by LACMTA security personnel on a regular periodic basis.

Alternative 3A: Wilshire BRT and Exposition LRT (MOS)

Impacts would be similar to Alternative 3. The MOS would include the portion of the corridor that contains the greatest concentration of schools and parks that would generate safety concerns. Along the Exposition alignment MOS there are 20 existing traffic signals. The introduction of LRT will provide one additional signalized intersection. In addition, nine legal pedestrian crossings that were unsignalized prior to the introduction of LRT will be closed, as the intersection will only allow for right turns into or out of the cross street.

Maintenance Yard

Northwest Corner of Chavez and Mission. This facility is located in an industrial area with minimal pedestrian activity and is not adjacent to any commercial facilities or residential properties. Therefore, there are no safety issues associated with the construction of this facility. No impacts would occur.

Existing MTA Division 1 (Alameda and 6th). This facility is located in an industrial area and has discussed above there is also minimal pedestrian activity near this site. There are no not adjacent commercial facilities or residential properties. Therefore, there are no safety issues associated with the construction of this facility. No impacts would occur.

Northeast Corner Alameda and Washington. This facility is located in an industrial area. There are no safety issues associated with the construction of this facility. No impacts would occur.

Southeast Corner of Alameda and Washington. This facility is located in an industrial area. There are no safety issues associated with the construction of this facility. No impacts would occur.

Exposition Right-Of-Way Hooper to Central. The immediate vicinity of this site is industrial, however, residential neighbors are located adjacent to this area. The introduction of heavy bus activity at this location could result in potentially significant safety related impacts on pedestrians; particularly those pedestrians with walk routes that cross access points to the facility.

Existing MTA South Park Shops (54th and Avalon). This facility is located in a residential neighborhood. Further, two schools and a park have been identified within a ½ mile. The introduction of heavy bus activity at this location could result in safety related impacts on pedestrians, particularly those pedestrians with walk routes that cross access points to the facility.

Implementation of Mitigation Measure 3.14-15 will ensure that less-than-significant impacts occur with respect to operation of the maintenance yard(s).

- *Mitigation Measure 3.14-15:* Bus travel routes will be designed to avoid residential streets.

Subway Design Option at USC/Exposition Park (for Alternatives 2, 2A, 3 and 3A)

USC Vermont Station is proposed as an underground station, between Waite Way and Menlo Avenue. An underground stations raises an issue of reduced visibility creating an "isolated environment." This type of station results in increased patron susceptibility to crime, resulting in a potentially significant impact.

Implementation of Mitigation Measures 3.14-16 through 3.14-18 will ensure that less than significant safety and security impacts occur with respect to the subway design option:

- *Mitigation Measure 3.14-16:* The station will maintain security lighting, particularly at entry points and stairwells to encourage increased security.
- *Mitigation Measure 3.14-17:* Onsite MTA security shall be maintained at subway locations.
- *Mitigation Measure 3.14-18:* All entry points to the subway station shall remain unobstructed to increase visibility.

Security Impacts

No Action Alternative (Baseline)

This option entails an increase in the operating bus fleet and minor transit service restructuring. Because there are no significant changes to bus service or operating characteristics no impacts on security are anticipated other than crime increases due to increased ridership.

Transportation System Management (TSM) Alternative

The TSM Alternative would also not result in major physical changes to bus service within the corridor. More extensive transit route restructuring and introduction of new Rapid Bus corridors would also not likely change the overall security environment within the corridor. No impacts would occur.

Alternative 1: Wilshire BRT (Baseline Median-Running)

The proposed Wilshire BRT route would use a highly developed urbanized corridor that exhibits an unusually high level of pedestrian activity. It is unlikely that stations located in the median of Wilshire Boulevard or on adjacent sidewalks would induce or create an unsecure environment, and no significant impacts are anticipated. It should be noted, however, that the Replacement Parking Strategy to be implemented in concert with the Wilshire BRT Alternative may involve the acquisition of property for off-street parking that is located behind commercial buildings. The creation of these lots may raise security concerns, particularly in terms of safe passage and pathways to the lots. Without mitigation, the security of these potential rear parking lots may be considered significant.

However, implementation of Mitigation Measure 3.14-19 will ensure that less-than-significant impacts occur:

- *Mitigation Measure 3.14-19:* Additional platform lighting and some supplementary pedestrian lighting shall be required for the medians of Wilshire Boulevard in order to assure patron safety.

Alternative 1A: Wilshire BRT (Median Adjacent Design Option)

There is no significant change in condition from that discussed in Alternative 1 that would result in a potential increase in crime. This route would be located in a highly developed urbanized corridor. Station location visibility is provided on both sides of the median. The provision of off-street parking located behind commercial buildings would also be potentially significant without the implementation of Mitigation Measure 3.14-19.

Alternative 1B: Wilshire BRT (Curb Adjacent Design Option)

Station visibility for this alternative would not be as obvious as with Alternative 1 and 1A. However, as stated above, Wilshire Boulevard exhibits an unusually high level of pedestrian activity and therefore, the potential for increased crime levels or a reduction in patron security is not at issue. No impacts would occur.

Alternative 2: Wilshire BRT and Exposition BRT (Full Length)

The Exposition corridor environment is entirely different from Wilshire. The route passes largely through lower density residential areas as well as industrial and commercial areas. Because it is a former railroad right-of-way in many segments, adjacent land uses are somewhat removed from the right-of-way creating an "isolated environment. These conditions combined with the fact that traffic and pedestrian volumes in adjacent areas are relatively low and the ambient crime rate is somewhat higher than the northern part of the corridor, raise the importance of security concern for both station areas and for proposed park and ride lots. Without mitigation, security concerns along the alignment would be considered significant.

However, implementation of Mitigation Measures 3.14-20 through 3.14-23 will ensure that less-than-significant impacts would occur:

- *Mitigation Measure 3.14-20:* The MTA will implement a security plan for the routes. The plan will include both in-car and station surveillance by MTA security or other local jurisdiction security personnel.
- *Mitigation Measure 3.14-21:* All stations shall be lit to standards that avoid shadows and all pedestrian pathways leading to/from sidewalks and parking areas will be well illuminated.

- *Mitigation Measure 3.14-22:* Stations will be equipped with security cameras to assist in monitoring as part of a security plan.
- *Mitigation Measure 3.14-23:* The station design should not include design elements that obstruct visibility or observation.

Alternative 2A: Wilshire BRT and Exposition BRT (MOS)

The MOS segment does not materially alter the conclusions above regarding the full route for Alternative 2. The right-of-way environment, because of the land use isolation, requires additional security measures to avoid significant impacts.

Alternative 3: Wilshire BRT and Exposition LRT

Security concerns along the Exposition portion would be similar to those described for the Alternative 2 and would require the implementation of Mitigation Measures 3.14-20 through 3.14-23 to ensure that less than significant impacts would occur.

Alternative 3A: Wilshire BRT and Exposition LRT MOS

The MOS segment does not materially alter the conclusions discussed above regarding the full route for Alternative 3.

Maintenance Yard

Northwest Corner of Chavez and Mission. This facility would be located in a commercial/industrial area. The facility will be a secure facility closed to public access. It is not anticipated that this facility would have an effect on security. No impacts would occur.

Existing MTA Division 1 (Alameda and 6th). This facility would be located in a commercial/industrial area near the boundary of downtown Los Angeles. As discussed above there are no security issues related to the construction of a maintenance yard at this location. No impacts would occur.

Northeast Corner Alameda and Washington. This facility is located in an industrial area. There are no security issues related to the construction of a maintenance yard at this location. No impacts would occur.

Southeast Corner of Alameda and Washington. This facility is located in an industrial area south of the proposed facility above. There are no security issues related to the construction of a maintenance yard at this location. No impacts would occur.

Exposition Right-Of-Way Hooper to Central. The location of this facility is surrounded by industrial and warehouse type uses. There are no security issues related to the construction of a maintenance yard at this location. No impacts would occur.

Existing MTA South Park Shops (54th and Avalon). This site is located in a predominately residential neighborhood. It is not anticipated that the nature of the surrounding area would lead to an increase in crime. As stated above this facility would be gated, secure and closed to public access. No impacts would occur.

Implementation of Mitigation Measures 3.14-15 will ensure that less-than-significant impacts would occur.

Subway Design Option at USC/Exposition Park (for Alternatives 2, 2A, 3 and 3A)

USC Vermont Station is proposed as an underground station, Between Waite Way and Menlo Avenue. There are no concerns as to design or location that would result in security related impacts.

3.14.4 Cumulative Impacts

The safety and security impacts of the alternatives considered are not expected to be cumulatively considerable. Impacts would be less than significant.

3.15 Community Facilities

3.15.1 Introduction

The Mid-City/Westside Transit Corridor contains one of the greatest concentrations of activity centers in the Los Angeles region. On the broad scale, transit improvements often enhance accessibility to these centers and other community facilities, particularly for the transit dependent. The specific alignment and physical features of fixed guideway improvements can also have adverse affects on some of these same facilities through the taking of physical property or through the disruption of vehicular or pedestrian access to these facilities. The discussion below addresses these issues in detail.

3.15.2 Affected Environment

Figure 3.15-1 identifies community facilities within approximately one-quarter mile of the Wilshire Boulevard and Exposition right-of-ways, respectively.

As shown in Table 3.15-1, there are the following community facilities within one-quarter mile of Wilshire Boulevard:

- Parks (nine)
- Public Elementary Schools (seven)
- Public Middle Schools (two)
- Public High Schools (two)
- Colleges, Universities and Trade Schools (none)
- Private Schools (six)
- Hospitals and Health Centers (three)
- Museums (five)
- Fire Stations (eight within one-mile)
- Cemeteries (two)
- Libraries (one)

Figure 3.15-1 Community Facilities

TABLE 3.15-1 WILSHIRE BRT COMMUNITY FACILITIES			
Corridor Segment	**Type**	**Facility Name**	**Location/Address**
1 - LA - Mid-City	Fire Station	Los Angeles Station	5821 W. 3rd St.
1 - LA - Mid-City	Fire Station	Los Angeles Station	4029 W. Wilshire Blvd.
2 - LA - Mid-City	Museum	L A Craft & Folk Art	5814 Wilshire Blvd.
1 - LA - Mid-City	Museum	Page Museum	2900 Exposition Blvd.
1 - LA - Mid-City	Museum	L A County Museum of Art	5905 Wilshire Blvd.
1 - LA - Mid-City	Museum	Peterson Automotive	6060 Wilshire Blvd.
1 - LA - Mid-City	Park	Carthay Circle Park	Wilshire Blvd. & Crescent Heights
1 - LA - Mid-City	Park	La Brea Tar Pits	Wilshire Blvd. & Curson
1 - LA - Mid-City	Park	La Cienega Park	8400 Gregory Way
1 - LA - Mid-City	School	Burroughs Middle School	600 S. McCadden Pl.
1 - LA - Mid-City	School	Cathedral Chapel School	8th St., Dunsmuir Ave. & Cochran
1 - LA - Mid-City	School	Private School	6th St., Van Ness
1 - LA - Mid-City	School	Wilton Place Elementary	745 S. Wilton Place
2 - Beverly Hills	Fire Station	Beverly Hills Station	445 N. Rexford Dr.
2 - Beverly Hills	Fire Station	Beverly Hills Station	1100 Coldwater Canyon Dr.
2 - Beverly Hills	Fire Station	Beverly Hills Station	180 S. Doheny Dr.
2 - Beverly Hills	Park	Oakhurst Park	Oakhurst Dr. south of Wilshire
2 - Beverly Hills	Park	Park	Reeves Dr south of Wilshire
2 - Beverly Hills	School	Berkeley Hall School	Burton Wy. & Clark Dr.
2 - Beverly Hills	School	Beverly Vista School	Elm Dr. & Charleville Blvd.
2 - Beverly Hills	School	El Rodeo Elementary	605 N. Whittier Dr.
2 - Beverly Hills	School	Good Shepard School	Linden Dr., McCarthy Dr.
2 - Beverly Hills	School	Horace Mann School	8701 Charleville Blvd.
3 - West Los	Cemetery	Los Angeles National	950 S. Sepulveda Blvd.
3 - West Los	Cemetery	Westwood Memorial Park	1218 Glendon Ave.
3 - West Los	Fire Station	Los Angeles Station	107 S. Beverly Glen Blvd.
3 - West Los	Fire Station	Los Angeles Station	1090 Veteran Ave.
3 - West Los	Hospital	Vet Affairs Med Center	11000 Wilshire Blvd.
3 - West Los	Museum	Armand Hammer	10889 Wilshire Blvd.
3 - West Los	Park	Westwood Park	1350 S. Sepulveda Blvd.
3 - West Los	School	Brockton Elementary	1309 Armacost Ave.
3 - West Los	School	Fairburn Elementary	1403 Fairburn Ave.
3 - West Los	School	University High School	11800 Texas Ave.
4 - Santa Monica	Fire Station	Santa Monica Station	1302 19th St.
4 - Santa Monica	Hospital	Saint Johns Hospital	1328 22nd St.
4 - Santa Monica	Hospital	Santa Monica – UCLA	1250 16th St.
4 - Santa Monica	Library	Santa Monica Main	1343 6th St.
4 - Santa Monica	Park	Douglas Park	1151 Chelsea Ave.
4 - Santa Monica	Park	Palisades Park	Ocean Ave.
4 - Santa Monica	School	High School (Private)	14th Street & California Ave.
4 - Santa Monica	School	Lincoln Middle School	1501 California Ave.
4 - Santa Monica	School	McKinley Elementary	2401 Santa Monica Blvd.
4 - Santa Monica	School	Olympic Continuation	1081 Arizona Ave.

TABLE 3.15-1 WILSHIRE BRT COMMUNITY FACILITIES			
Corridor Segment	**Type**	**Facility Name**	**Location/Address**
4 - Santa Monica	School	Saint Monica High School	1030 Lincoln Blvd.
4 - Santa Monica	School	Santa Monica Elementary	1039 7th Street

Within one-quarter mile of the Exposition BRT and LRT rights-of-ways there are the following facilities (see Table 3.15-2 for specific details):

- Parks (eleven)
- Public Elementary Schools (four)
- Public Middle Schools (three)
- Public High Schools (five)
- Colleges, Universities and Trade Schools (three)
- Private Schools (three)
- Hospitals and Health Centers (three)
- Museums (four)
- Fire Stations (twelve within one-mile)
- Cemeteries (none)
- Libraries (one)

TABLE 3.15-2 EXPOSITION BRT COMMUNITY FACILITIES			
Corridor Segment	**Type**	**Facility Name**	**Location /Address**
1 - LA South	Fire Station	Los Angeles Station	1335 S. Olive St.
1 - LA South	Fire Station	Los Angeles Station	915 W. Jefferson Blvd.
1 - LA South	Fire Station	Los Angeles Station	3661 7th Ave.
1 - LA South	Fire Station	Los Angeles Station	4470 Coliseum St.
1 - LA South	Hospital	California Hospital Medical Center	1414 Grand Ave.
1 - LA South	Hospital	Orothopedic Hospital	2400 S. Flower St.
1 - LA South	Library	Exposition Park Regional Library	3665 S. Vermont
1 - LA South	Museum	Aerospace Museum	Exposition Blvd. & Kinsey Dr.
1 - LA South	Museum	Natural History Museum	Exposition Blvd. & Kinsey Dr.
1 - LA South	Museum	Museum of Science and Industry	Museum Dr. & State Dr.
1 - LA South	Museum	Afro-American Museum	600 State Dr.
1 - LA South	Park	Exposition Park	Exposition Blvd. & Figueroa
1 - LA South	Park	38th & Normandie Park	Rolland Curtis Pl. & Normandie
1 - LA South	Park	Rancho Cienega Sports Park	5001 Rodeo Rd.
1 - LA South	Park	Baldwin Hills Recreation Center	5401 Highlight Pl.
1 - LA South	Park	Westside Park	3085 S. Fairfax
1 - LA South	School	Los Angeles Trade Tech College	400 E. Washington Blvd.
1 - LA South	School	Mount Saint Mary's College	10 Chester Place
1 - LA South	School	Elementary School (Private)	Adams Blvd. & Figueroa St.
1 - LA South	School	32nd St./ USC Performing Art Mag	822W. 32nd St.
1 - LA South	School	Adams Middle School	151 W.30th Street
1 - LA South	School	University of Southern California	Exposition Blvd. & Vermont

TABLE 3.15-2 EXPOSITION BRT COMMUNITY FACILITIES			
Corridor Segment	**Type**	**Facility Name**	**Location /Address**
1 - LA South	School	Weemes Elementary School	1260 W. 36th Place
1 - LA South	School	Foshay Middle School	3751 S. Harvard Blvd.
1 - LA South	School	Dorsey High School	3537 Farmdale Avenue
1 - LA South	School	Hamilton High School	2955 Robertson Blvd.
2 - Culver City	Civic Center	Culver City, City Hall	Culver Blvd. & Dusquesne
2 - Culver City	Fire Station	Culver City Station	9600 Culver Blvd.
2 - Culver City	Fire Station	Culver City Station	11252 Washington Blvd.
2 - Culver City	Fire Station	Culver City Station	11304 Segrell Way
2 - Culver City	Hospital	Brotman Medical Center	3828 Delmas Terr.
2 - Culver City	Park	Syd Kronenthal Park	3459 McManus
2 - Culver City	School	Culver City Middle School	Irving Pl., Lindblade St.
2 - Culver City	School	La Ballona Elementary School	Matterson Ave., Girard Ave.
3 - West Los	Fire Station	Los Angeles Station	10234 National Blvd.
3 - West Los	Fire Station	Los Angeles Station	11505 Olympic Blvd.
3 - West Los	Park	Media Park	Venice Blvd. & Culver Blvd.
3 - West Los	Park	Mar Vista Recreation Center	11430 Woodbine St.
3 - West Los	School	Charnock Elementary School	11133 Charnock Road
3 - West Los	School	Clover Elementary School	11020 Clover Avenue
3 - West Los	School	Webster Middle School	1130 W. Graham Place
3 - West Los	School	Edison Elementary School	2425 Kansas Ave.
4 - Santa Monica	Civic Center	Santa Monica City Hall	1685 Main St.
4 - Santa Monica	Fire Station	Santa Monica Station	1444 7th St.
4 - Santa Monica	Fire Station	Santa Monica Station (under const)	222 Hollister Ave.
4 - Santa Monica	Fire Station	Santa Monica Station	2450 Ashland Ave.
4 - Santa Monica	Museum	Bergamot Station	2525 Michigan Ave.
4 - Santa Monica	Park	Stewart Street Park	3459 McManus Ave
4 - Santa Monica	Park	Memorial Park	Olympic Blvd. & 14th St.
4 - Santa Monica	Park	Palisades Park	Ocean Ave.
4 - Santa Monica	School	Garfield Continuation High School	Olympic Blvd. & 16th Street
4 - Santa Monica	School	Santa Monica High School	1039 7th Street
4 - Santa Monica	School	Crossroads Elementary	1714 21st Street

3.15.3 Impact Assessment and Mitigation Measures

Standards of Significance

From the standpoint of transit accessibility, it is expected that there would be a beneficial impact if a community facility were located within one-quarter mile of a transit station. With respect to adverse impacts, the taking of the facility and/or the creation of barriers or substantial disruption to pedestrian and vehicular access to a facility would constitute a significant adverse impact.

Methodology for Impact Evaluation

Potential impacts to community facilities are determined by overlaying the proposed guideway alignments, station areas, and roadway modifications to the location of community facilities. For these areas, a community facility will either be directly affected (a physical taking as described in the Land Acquisition/Displacement section of this report) or indirectly affected by the proposed transit improvements and facilities because of proposed changes to pedestrian or vehicular access. For discussion related to pedestrian safety see Section 3.14 Safety and Security of this report.

Impacts

No Action (Baseline)

Because this option involves minor changes to the bus fleet and some restructuring of transit routes, no impacts on the community facilities is expected.

Transportation Systems Management (TSM) Alternative

While the TSM Alternative anticipates greater changes to the bus fleet, more extensive route restructuring and introduction of additional rapid bus corridors, it is not expected there would be adverse impacts on community facilities.

Alternative 1: Wilshire BRT Alternative (Baseline Median-Running)

Beneficial Impacts. As shown in Table 3.15-3, 3 of the 45 community facilities along the Wilshire BRT route would be located within one-quarter mile of proposed station locations and would benefit from this improved transit access.

Adverse Impacts. Although no community facilities would be displaced by the Wilshire BRT Alternative, it is anticipated that there would be some adverse proximity impacts, particularly the loss of street parking that is partially used by patrons of such facilities as the Folk Art Museum, Page Museum, La Brea Tar Pits, and Los Angeles County Art Museum. In addition, the reduction in the number of left turn opportunities from Wilshire Boulevard could affect vehicle access and disrupt circulation patterns at approximately eight community facilities. Adverse proximity impacts (including noise and air quality) may also occur at other community facilities identified in Table 3.15-3, although none of these uses would be physically altered in a significantly adverse way. Proximity impacts related to air quality, noise, safety, and other related issues are discussed separately in the applicable sections of this report. It is not expected that the Wilshire BRT guideway would create a barrier to pedestrian access to any community facility along the BRT route. Pedestrian safety issues are discussed in Section 3.14 of this report. Significant adverse impacts would not occur.

TABLE 3.15-3
WILSHIRE BRT IMPACT TO COMMUNITY FACILITIES

Corridor Segment	Type	Facility Name	Location/Address	Within 1/4 Mile of Station	Land Acquisition	Loss of Support Street Parking	Affect Vehicle Access	Barrier to Ped Access
1 - LA - Mid-City	Fire Station	Los Angeles Station	5821 W. 3rd St.	No	No	No	No	No
1 - LA - Mid-City	Fire Station	Los Angeles Station	4029 W. Wilshire Blvd.	No	No	No	Yes	No
2 - LA - Mid-City	Museum	LA Craft & Folk Art	5814 Wilshire Blvd	Yes	No	Yes	Yes	No
1 - LA - Mid-City	Museum	Page Museum	2900 Exposition Blvd.	No	No	Yes	Yes	No
1 - LA - Mid-City	Museum	L A County Museum of Art	5905 Wilshire Blvd.	Yes	No	Yes	Yes	No
1 - LA - Mid-City	Museum	Peterson Automotive Museum	6060 Wilshire Blvd.	Yes	No	No	Yes	No
1 - LA - Mid-City	Park	Carthay Circle Park	Wilshire Blvd. & Crescent Heights Blvd.	No	No	No	No	No
1 - LA - Mid-City	Park	La Brea Tar Pits	Wilshire Blvd. & Curson	No	No	No	Yes	No
1 - LA - Mid-City	Park	La Cienega Park	8400 Gregory Way	Yes	No	No	No	No
1 - LA - Mid-City	School	Burroughs Middle School	600 S. McCadden Pl.	No	No	No	Yes	No

TABLE 3.15-3
WILSHIRE BRT IMPACT TO COMMUNITY FACILITIES

Corridor Segment	Type	Facility Name	Location/Address	Within 1/4 Mile of Station	Land Acquisition	Loss of Support Street Parking	Affect Vehicle Access	Barrier to Ped Access
1 - LA - Mid-City	School	Cathedral Chapel School	8th St., Dunsmuir Ave. & Cochran Ave.	Yes	No	No	No	No
1 - LA - Mid-City	School	Private School	6th St., Van Ness	Yes	No	No	No	No
1 - LA - Mid-City	School	Wilton Place Elementary School	745 S. Wilton Place	No	No	No	No	No
2 - Beverly Hills	Fire Station	Beverly Hills Station	445 N. Rexford Dr.	No	No	No	No	No
2 - Beverly Hills	Fire Station	Beverly Hills Station	1100 Coldwater Canyon Dr.	No	No	No	No	No
2 - Beverly Hills	Fire Station	Beverly Hills Station	180 S. Doheny Dr.	No	No	No	No	No
2 - Beverly Hills	Park	Oakhurst Park	Oakhurst Dr. south of Wilshire	No	No	No	No	No
2 - Beverly Hills	Park	Park	Reeves Dr south of Wilshire	No	No	No	No	No
2 - Beverly Hills	School	Berkeley Hall School	Burton Wy. & Clark Dr.	No	No	No	No	No
2 - Beverly Hills	School	Beverly Vista School	Elm Dr. & Charleville Blvd.	No	No	No	No	No
2 - Beverly Hills	School	El Rodeo Elementary School	605 N. Whittier Dr.	No	No	No	No	No
2 - Beverly Hills	School	Good Shepard School	Linden Dr., McCarthy Dr., & Charleville Blvd.	Yes	No	No	No	No
2 - Beverly Hills	School	Horace Mann School	8701 Charleville Blvd.	Yes	No	No	No	No
3 - West Los Angeles	Cemetery	Los Angeles National Cemetery	950 S. Sepulveda Blvd.	No	No	No	No	No
3 - West Los Angeles	Cemetery	Westwood Memorial Park	1218 Glendon Ave.	No	No	No	No	No
3 - West Los Angeles	Fire Station	Los Angeles Station	107 S. Beverly Glen Blvd.	No	No	No	No	No
3 - West Los Angeles	Fire Station	Los Angeles Station	1090 Veteran Ave.	No	No	No	No	No
3 - West Los Angeles	Hospital	Vet Affairs Med Center West Los Angeles	11000 Wilshire Blvd.	No	No	No	No	No
3 - West Los Angeles	Museum	Armand Hammer Museum	10889 Wilshire Blvd.	Yes	No	No	Yes	No
3 - West Los Angeles	Park	Westwood Park	1350 S. Sepulveda Blvd.	No	No	No	No	No
3 - West Los Angeles	School	Brockton Elementary School	1309 Armacost Ave.	No	No	No	No	No
3 - West Los Angeles	School	Fairburn Elementary School	1403 Fairburn Ave.	No	No	No	No	No
3 - West Los Angeles	School	University High School	11800 Texas Ave.	No	No	No	No	No
4 - Santa Monica	Fire Station	Santa Monica Station	1302 19th St.	No	No	No	No	No
4 - Santa Monica	Hospital	Saint Johns Hospital & Health Center	1328 22nd St.	No	No	No	No	No
4 - Santa Monica	Hospital	Santa Monica – UCLA Medical Center	1250 16th St.	Yes	No	No	No	No
4 - Santa Monica	Library	Santa Monica Main Library	1343 6th St.	No	No	No	No	No
4 - Santa Monica	Park	Douglas Park	1151 Chelsea Ave.	No	No	No	No	No
4 - Santa Monica	Park	Palisades Park	Ocean Ave.	Yes	No	No	No	No
4 - Santa Monica	School	High School (Private)	14th Street & California Ave.	Yes	No	No	No	No
4 - Santa Monica	School	Lincoln Middle	1501 California Ave.	Yes	No	No	No	No

TABLE 3.15-3 WILSHIRE BRT IMPACT TO COMMUNITY FACILITIES								
Corridor Segment	**Type**	**Facility Name**	**Location/Address**	**Within 1/4 Mile of Station**	**Land Acquisition**	**Loss of Support Street Parking**	**Affect Vehicle Access**	**Barrier to Ped Access**
		School						
4 - Santa Monica	School	McKinley Elementary School	2401 Santa Monica Blvd.	No	No	No	No	No
4 - Santa Monica	School	Olympic Continuation School	1081 Arizona Ave.	No	No	No	No	No
4 - Santa Monica	School	Saint Monica High School	1030 Lincoln Blvd.	No	No	No	No	No
4 - Santa Monica	School	Santa Monica Elementary School	1039 7th Street	No	No	No	No	No
TOTAL "Yes"				**13**	**0**	**3**	**8**	**0**
Source: Terry A. Hayes Associates, 2000.								

Alternative 1A: Wilshire BRT (Median Adjacent)

This option would have effects similar to Alternative 1. It is expected that there would continue to be adverse effects on local circulation in the vicinity of community facilities because of the restricted left turn access. No facilities would be displaced as a result of this option. No impacts would occur.

Alternative 1B: Wilshire BRT (Curb Adjacent Design Option)

In comparison to the center median baseline alternative and the median adjacent design option, this option which place the BRT operations in the curb lane, and would be less disruptive to localized circulation near community facilities because this option would not restrict left turn access along the route. Access to facilities would occur as it does now.

It should be noted that the presence of buses traveling at somewhat higher speeds than the normal traffic flow could, however, effect pedestrians perception of safe conditions along the sidewalk and would likely require a public education program, particularly for school children.

Similar to the other components of the Wilshire BRT Alternative, this design option would also not displace any existing community facilities. No impacts would occur.

Alternative 2: Wilshire BRT and Exposition BRT (Full Length)

Beneficial Impacts. In addition to the 13 facilities along the Wilshire BRT route, 21 of the 53 community facilities along the Exposition BRT route would be located within one-quarter mile of proposed station locations and would benefit from this improved transit access (Table 3.15-4). This combined option would mean that approximately 34 percent of the community facilities along both BRT routes would have convenient transit access.

Adverse Impacts. The proposed park and ride a lot near Cloverfield and Olympic would displace the Bergamot Art Center and the associated museum and art galleries in Santa Monica. The impact to this publicly owned facility would be considered significant. The displacement of the Bergamot Art Center (discussed further in Section 3.6) would be mitigated through implementation of Mitigation Measure 3.5-1, which is presented at the end of this discussion and provides for relocation assistance in compliance with the *Uniform Relocation Assistance and Real Property Acquisition Polices Act of* 1970, as amended (Uniform Act). The Uniform Act is further detailed in Section 3.6. There would also be a loss of street parking surrounding seven community facilities. Most of these impacts are concentrated in the Exposition Park area and include the University of Southern California, Exposition Park and the museums located within the park. In total, seven community facilities would be affected in this manner; however, implementation of Mitigation Measures 3.15-2 and 3.15-3 will ensure that less-than-significant impacts occur:

- *Mitigation Measure 3.15-1:* The LACMTA shall coordinate with the City of Santa Monica to find a suitable relocation site or facility, or examine other shared use opportunities for the Bergamot Station Art Center.
- *Mitigation Measure 3.15-2:* For those community facilities that rely in part on street parking, the LACMTA shall provide conveniently located off-street parking in accordance with its Replacement Parking Strategy. It is expected that loss spaces would be replaced on a one-for-one basis.
- *Mitigation Measure 3.15-3:* For all community facilities where circulation patterns have been altered because of the construction of a fixed guideway and the possible removal of left turns, the LACMTA shall coordinate with each facility to ensure that convenient vehicular access to driveways and off-street parking areas will be maintained.

It is not expected that the exclusive guideway portions of the BRT route along the Exposition right-of-way, Venice or Sepulveda would constitute a barrier to pedestrian access to nearby community facilities. Pedestrian safety concerns are discussed in Section 3.14.

Alternative 2A: Wilshire BRT and Exposition BRT (MOS)

Beneficial Impacts. In addition to the 13 facilities along the Wilshire BRT route, 14 of the 53 community facilities along the Exposition BRT route would be located within one-quarter mile of proposed station locations in the MOS and would benefit from this improved transit access (see Table 3.15-4).

Adverse Impacts. No community facility would be displaced as a result of the MOS. There would also be a loss of street parking surrounding six community facilities. Most of these impacts are concentrated in the Exposition Park area and include the University of Southern California, Exposition Park and the museums located within the park. Significant impacts would not occur.

TABLE 3.15-4
EXPOSITION BRT IMPACT TO COMMUNITY FACILITIES

Corridor Segment	Facility Name	Type	Location /Address	Within 1/4 Mile of Station	Land Acquisition	Loss of Support Street Parking	Affect Vehicle Access	Barrier to Ped Access
1 - LA South	Los Angeles Station	Fire Station	1335 S. Olive St.	No	No	No	No	No
1 - LA South	Los Angeles Station	Fire Station	915 W. Jefferson Blvd.	No	No	No	No	No
1 - LA South	Los Angeles Station	Fire Station	3661 7th Ave.	No	No	No	No	No
1 - LA South	Los Angeles Station	Fire Station	4470 Coliseum St.	No	No	No	No	No

TABLE 3.15-4
EXPOSITION BRT IMPACT TO COMMUNITY FACILITIES

Corridor Segment	Facility Name	Type	Location /Address	Within 1/4 Mile of Station	Land Acquisition	Loss of Support Street Parking	Affect Vehicle Access	Barrier to Ped Access
1 - LA South	California Hospital Medical Center	Hospitals	1414 Grand Ave.	Yes	No	No	No	No
1 - LA South	Orothopedic Hospital	Hospitals	2400 S. Flower St.	Yes	No	No	No	No
1 - LA South	Exposition Park Regional Library	Library	3665 S. Vermont	No	No	No	No	No
1 - LA South	Aerospace Museum	Museum	Exposition Blvd. & Kinsey Dr.	Yes	No	Yes	No	No
1 - LA South	Natural History Museum of Los Angeles County	Museum	Exposition Blvd. & Kinsey Dr.	Yes	No	Yes	No	No
1 - LA South	Museum of Science and Industry	Museum	Museum Dr. & State Dr.	No	No	Yes	No	No
1 - LA South	Afro-America Museum	Museum	600 State Dr.	No	No	Yes	No	No
1 - LA South	Exposition Park	Park	Exposition Blvd. & Figueroa St.	No	No	Yes	No	No
1 - LA South	38th & Normandie Park	Park	Rolland Curtis Pl. & Normandie Ave.	No	No	No	No	No
1 - LA South	Rancho Cienega Sports Park	Park	5001 Rodeo Rd.	No	No	No	Yes	No
1 - LA South	Baldwin Hills Recreation Center	Park	5401 Highlight Pl.	No	No	No	No	No
1 - LA South	Westside Park	Park	3085 S. Fairfax	Yes	No	No	No	No
1 - LA South	Los Angeles Trade Tech College	School	400 E. Washington Blvd.	Yes	No	No	No	No
1 - LA South	Mount Saint Mary's College	School	10 Chester Place	Yes	No	No	No	No
1 - LA South	Elementary School (Private)	School	Adams Blvd. & Figueroa St.	Yes	No	No	No	No
1 - LA South	32nd St./ USC Performing Art Mag School of Choice	School	822W. 32nd St.	Yes	No	No	No	No
1 - LA South	Adams Middle School	School	151 W.30th Street	No	No	No	No	No
1 - LA South	University of Southern California	School	Exposition Blvd. & Vermont Ave.	No	No	Yes	Yes	No
1 - LA South	Weemes Elementary School	School	1260 W. 36th Place	No	No	No	No	No

TABLE 3.15-4
EXPOSITION BRT IMPACT TO COMMUNITY FACILITIES

Corridor Segment	Facility Name	Type	Location /Address	Within 1/4 Mile of Station	Land Acquisition	Loss of Support Street Parking	Affect Vehicle Access	Barrier to Ped Access
1 - LA South	Foshay Middle School	School	3751 S. Harvard Blvd.	Yes	No	No	No	No
1 - LA South	Dorsey High School	School	3537 Farmdale Avenue	No	No	No	No	No
1 - LA South	Hamilton High School	School	2955 Robertson Blvd.	Yes	No	No	No	No
2 - Culver City	Culver City, City Hall	Civic Ctr	Culver Blvd. & Dusquesne Ave.	No	No	No	No	No
2 - Culver City	Culver City Station	Fire Station	9600 Culver Blvd.	No	No	No	No	No
2 - Culver City	Culver City Station	Fire Station	11252 Washington Blvd.	No	No	No	No	No
2 - Culver City	Culver City Station	Fire Station	11304 Segrell Way	No	No	No	No	No
2 - Culver City	Brotman Medical Center	Hospitals	3828 Delmas Terr.	Yes	No	No	No	No
2 - Culver City	Syd Kronenthal Park	Park	3459 McManus	Yes	No	No	No	No
2 - Culver City	Culver City Middle School	School	Irving Pl., Lindblade St.	Yes	No	No	No	No
2 - Culver City	La Ballona Elementary School	School	Matterson Ave., Girard Ave. & Washington Ave.	No	No	No	No	No
3 - West Los Angeles	Los Angeles Station	Fire Station	10234 National Blvd.	No	No	No	No	No
3 - West Los Angeles	Los Angeles Station	Fire Station	11505 Olympic Blvd.	No	No	No	No	No
3 - West Los Angeles	Media Park	Park	Venice Blvd. & Culver Blvd.	Yes	No	No	No	No
3 - West Los Angeles	Mar Vista Recreation Center	Park	11430 Woodbine St.	No	No	No	No	No
3 - West Los Angeles	Charnock Elementary School	School	11133 Charnock Road	No	No	No	Yes	No
3 - West Los Angeles	Clover Elementary School	School	11020 Clover Avenue	Yes	No	No	No	No
3 - West Los Angeles	Webster Middle School	School	1130 W. Graham Place	No	No	No	No	No
3 - West Los Angeles	Edison Elementary School	School	2425 Kansas Ave.	No	No	No	No	No
4 - Santa Monica	Santa Monica City Hall	Civic Ctr	1685 Main St.	Yes	No	No	No	No
4 - Santa Monica	Santa Monica Station	Fire Station	1444 7th St.	No	No	No	No	No
4 - Santa Monica	Santa Monica Station (under construction)	Fire Station	222 Hollister Ave.	No	No	No	No	No
4 - Santa Monica	Santa Monica Station	Fire Station	2450 Ashland Ave.	No	No	No	No	No

TABLE 3.15-4
EXPOSITION BRT IMPACT TO COMMUNITY FACILITIES

Corridor Segment	Facility Name	Type	Location /Address	Within 1/4 Mile of Station	Land Acquisition	Loss of Support Street Parking	Affect Vehicle Access	Barrier to Ped Access
4 - Santa Monica	Bergamot Station	Museum	2525 Michigan Ave.	Yes	Yes	na	na	na
4 - Santa Monica	Stewart Street Park	Park	3459 McManus Ave	No	No	No	No	No
4 - Santa Monica	Memorial Park	Park	Olympic Blvd. & 14th St.	Yes	No	Yes	No	No
4 - Santa Monica	Palisades Park	Park	Ocean Ave.	No	No	No	No	No
4 - Santa Monica	Garfield Continuation High School	School	Olympic Blvd. & 16th Street	Yes	No	No	No	No
4 - Santa Monica	Santa Monica High School	School	1039 7th Street	No	No	No	Yes	No
4 - Santa Monica	Crossroads Elementary & High School	School	1714 21st Street	Yes	No	No	Yes	No
TOTAL "Yes"				**21**	**1**	**7**	**5**	**0**

Source: Terry A. Hayes Associates, 2000.

<u>Alternative 3: Wilshire BRT and Exposition LRT (Full Length)</u>

Beneficial Impacts. In addition to the 13 facilities along the Wilshire BRT route, 23 of the 53 community facilities along the Exposition LRT route would be located within one-quarter mile of proposed station locations and would benefit from this improved transit access (Table 3.15-5). This combined option would mean that approximately 36 percent of the community facilities along both BRT routes would have convenient transit access.

Adverse Impacts. Similar to the Exposition BRT, the proposed park and ride a lot near Cloverfield and Olympic would displace the Bergamot Art Center and the associated museum and art galleries in Santa Monica. The impact to this publicly owned facility would be considered significant, without implementation of Mitigation Measure 3.15-1. The displacement of the Bergamot Art Center (discussed further in Section 3.6) would be mitigated through relocation assistance in compliance with the *Uniform Relocation Assistance and Real Property Acquisition Polices Act of* 1970, as amended (Uniform Act). The Uniform Act is detailed in Section 3.6. There would also be a similar loss of street parking surrounding community facilities largely in the Exposition Park area; however, these impacts would be reduced to less-than-significant levels with the implementation of Mitigation Measures 3.15-2 and 3.15-3.

It is not expected that the exclusive guideway portions of the LRT route along the Exposition right-of-way, Venice or Sepulveda would constitute a barrier to pedestrian access to nearby community facilities. Pedestrian safety concerns are discussed in Section 3.14.

<u>Alternative 3A: Wilshire BRT and Exposition LRT (MOS)</u>

Beneficial Impacts. In addition to the 13 facilities along the Wilshire BRT route, 16 of the 53 community facilities along the Exposition LRT route would be located within one-quarter mile of proposed station locations in the MOS and would benefit from this improved transit access.

Adverse Impacts. No community facility would be displaced as a result of the MOS. There would also be a loss of street parking surrounding six community facilities. Most of these impacts are concentrated in the Exposition Park area and include the University of Southern California, Exposition Park and the museums located within the park.

TABLE 3.15-5
EXPOSITION LRT IMPACT TO COMMUNITY FACILITIES

Corridor Segment	Type	Facility Name	Location /Address	Within 1/4 Mile of Station	Land Acquisition	Loss of Support Street Parking	Affect Vehicle Access	Barrier to Ped Access
1 - LA South	Fire Station	Los Angeles Station	1335 S. Olive St.	No	No	No	No	No
1 - LA South	Fire Station	Los Angeles Station	915 W. Jefferson Blvd.	No	No	No	No	No
1 - LA South	Fire Station	Los Angeles Station	3661 7th Ave.	No	No	No	No	No
1 - LA South	Fire Station	Los Angeles Station	4470 Coliseum St.	No	No	No	No	No
1 - LA South	Hospitals	California Hospital Medical Center	1414 Grand Ave.	Yes	No	No	No	No
1 - LA South	Hospitals	Orothopedic Hospital	2400 S. Flower St.	Yes	No	No	No	No
1 - LA South	Library	Exposition Park Regional Library	3665 S. Vermont	No	No	No	No	No
1 - LA South	Museum	Aerospace Museum	Exposition Blvd. & Kinsey Dr.	Yes	No	Yes	No	No
1 - LA South	Museum	Natural History Museum of Los Angeles County	Exposition Blvd. & Kinsey Dr.	Yes	No	Yes	No	No
1 - LA South	Museum	Museum of Science and Industry	Museum Dr. & State Dr.	Yes	No	Yes	No	No
1 - LA South	Museum	Afro-American Museum	600 State Dr.	Yes	No	Yes	No	No
1 - LA South	Park	Exposition Park	Exposition Blvd. & Figueroa St.	No	No	Yes	No	No
1 - LA South	Park	38th & Normandie Park	Rolland Curtis Pl. & Normandie Ave.	No	No	No	No	No
1 - LA South	Park	Rancho Cienega Sports Park	5001 Rodeo Rd.	No	No	No	Yes	No
1 - LA South	Park	Baldwin Hills Recreation Center	5401 Highlight Pl.	No	No	No	No	No
1 - LA South	Park	Westside Park	3085 S. Fairfax	Yes	No	No	No	No
1 - LA South	School	Los Angeles Trade Tech College	400 E. Washington Blvd.	No	No	No	No	No
1 - LA South	School	Mount Saint Mary's College	10 Chester Place	Yes	No	No	No	No

TABLE 3.15-5
EXPOSITION LRT IMPACT TO COMMUNITY FACILITIES

Corridor Segment	Type	Facility Name	Location /Address	Within 1/4 Mile of Station	Land Acquisition	Loss of Support Street Parking	Affect Vehicle Access	Barrier to Ped Access
1 - LA South	School	Elementary School (Private)	Adams Blvd. & Figueroa St.	Yes	No	No	No	No
1 - LA South	School	USC Performing Art Mag School	822W. 32nd St.	Yes	No	No	No	No
1 - LA South	School	Adams Middle School	151 W.30th Street	No	No	No	No	No
1 - LA South	School	University of Southern California	Exposition Blvd. & Vermont Ave.	Yes	No	Yes	Yes	Yes
1 - LA South	School	Weemes Elementary School	1260 W. 36th Place	No	No	No	No	No
1 - LA South	School	Foshay Middle School	3751 S. Harvard Blvd.	Yes	No	No	No	Yes
1 - LA South	School	Dorsey High School	3537 Farmdale Avenue	No	No	No	No	Yes
1 - LA South	School	Hamilton High School	2955 Robertson Blvd.	Yes	No	No	No	No
2 - Culver City	Civic Ctr	Culver City, City Hall	Culver Blvd. & Dusquesne Ave.	No	No	No	No	No
2 - Culver City	Fire Station	Culver City Station	9600 Culver Blvd.	No	No	No	No	No
2 - Culver City	Fire Station	Culver City Station	11252 Washington Blvd.	No	No	No	No	No
2 - Culver City	Fire Station	Culver City Station	11304 Segrell Way	No	No	No	No	No
2 - Culver City	Hospitals	Brotman Medical Center	3828 Delmas Terr.	Yes	No	No	No	No
2 - Culver City	Park	Syd Kronenthal Park	3459 McManus	Yes	No	No	No	No
2 - Culver City	School	Culver City Middle School	Irving Pl., Lindblade St.	Yes	No	No	No	No
2 - Culver City	School	La Ballona Elementary School	Girard Ave. & Washington Ave.	No	No	No	No	No
3 - West Los Angeles	Fire Station	Los Angeles Station	10234 National Blvd.	No	No	No	No	No
3 - West Los Angeles	Fire Station	Los Angeles Station	11505 Olympic Blvd.	No	No	No	No	No
3 - West Los Angeles	Park	Media Park	Venice Blvd. & Culver Blvd.	Yes	No	No	No	No
3 - West Los Angeles	Park	Mar Vista Recreation Center	11430 Woodbine St.	No	No	No	No	No
3 - West Los Angeles	School	Charnock Elementary School	11133 Charnock Road	No	No	No	Yes	Yes

TABLE 3.15-5
EXPOSITION LRT IMPACT TO COMMUNITY FACILITIES

Corridor Segment	Type	Facility Name	Location /Address	Within 1/4 Mile of Station	Land Acquisition	Loss of Support Street Parking	Affect Vehicle Access	Barrier to Ped Access
3 - West Los Angeles	School	Clover Elementary School	11020 Clover Avenue	Yes	No	No	No	No
3 - West Los Angeles	School	Webster Middle School	1130 W. Graham Place	No	No	No	No	No
3 - West Los Angeles	School	Edison Elementary School	2425 Kansas Ave.	No	No	No	No	No
4 - Santa Monica	Civic Ctr	Santa Monica City Hall	1685 Main St.	Yes	No	No	No	No
4 - Santa Monica	Fire Station	Santa Monica Station	1444 7th St.	No	No	No	No	No
4 - Santa Monica	Fire Station	Santa Monica Station (under const)	222 Hollister Ave.	No	No	No	No	No
4 - Santa Monica	Fire Station	Santa Monica Station	2450 Ashland Ave.	No	No	No	No	No
4 - Santa Monica	Museum	Bergamot Station	2525 Michigan Ave.	Yes	Yes	Yes	Yes	No
4 - Santa Monica	Park	Stewart Street Park	3459 McManus Ave	No	No	No	No	No
4 - Santa Monica	Park	Memorial Park	Olympic Blvd. & 14th St.	Yes	No	Yes	No	Yes
4 - Santa Monica	Park	Palisades Park	Ocean Ave.	No	No	No	No	No
4 - Santa Monica	School	Garfield Continuation High School	Olympic Blvd. & 16th Street	Yes	No	No	No	No
4 - Santa Monica	School	Santa Monica High School	1039 7th Street	No	No	No	Yes	Yes
4 - Santa Monica	School	Crossroads Elem & High School	1714 21st Street	Yes	No	No	Yes	No
TOTAL "Yes"				**23**	**1**	**8**	**6**	**6**

Source: Terry A. Hayes Associates, 2000.

Maintenance Yard

As discussed in Section 2 of this report, the MTA is considering candidate maintenance yard site locations for BRT operations. Six candidate sites are under consideration. The effects of these sites on community facilities is discussed below:

Northwest Corner of Chavez and Mission. Site is located within an industrial/commercial area. There are three public schools within ½ mile of the site. These facilities, however, are located south of the SR101 and I-10 freeways in Boyle Heights would not likely be affected by the operation of bus maintenance facility on the north side of the freeway. No Impacts would occur.

Existing MTA Division 1 (Alameda and 6th). This site is located in a commercial and industrial area along the perimeter of downtown Los Angeles. Community facilities within ½ mile of the site include a small pocket park at 6th Street and Gladys Avenue, a public school at Wilson and Decatur Place; and a public school near 9th Street and Olympic. None of these facilities are directly adjacent to the site and accessibility to these facilities would not be affected by the expanded operations on the existing maintenance yard site. No impacts would occur.

Northeast Corner of Alameda and Washington. The site is located in an industrial area. There are no community facilities within ½ mile of the site and no impacts are anticipated.

Southeast Corner of Alameda and Washington. The site is located in an industrial area. There are no community facilities within ½ mile of the site and no impacts are anticipated.

Exposition ROW (Hooper to Central). The immediate vicinity of this site is surrounded by industrial and warehouse type uses. However, beyond these directly adjacent buildings there are residential neighborhoods that contain a variety of community facilities, including two recreation centers, one high school and two elementary schools. Use of the Exposition ROW site for bus maintenance would require that buses travel a minor arterials and local streets. Increased bus activity at this site would likely be disruptive to local circulation patterns particularly walk routes to schools and the park. The residential character of the surrounding area strongly suggests that pedestrian access to nearby facilities would be impaired by the presence of increase buses from the maintenance yard. Impacts from this maintenance yard would be potentially significant.

Existing MTA South Park Shops (54th and Avalon). Although this is an existing MTA facility, only small numbers of buses are currently maintained at this site. The site is located within a residential neighborhood and it is within ½ mile of two schools and South Park. Increased bus activity at this site would likely be disruptive to local circulation patterns particularly walk routes to schools and the park. The residential character of the surrounding area strongly suggests that pedestrian access to nearby facilities would be impaired by the presence of increase buses from the maintenance yard. Impacts from this maintenance yard would be potentially significant.

Subway Design Option at USC/Exposition Park (for Alternatives 2, 2A, 3 and 3A)

The excavation of a tunnel for BRT or LRT would pass through an area between the University of Southern California on the north side of Exposition Boulevard and the museums and facilities in Exposition Park on the south side. During the period of construction, the work would likely require the removal of on-street parking in this area. This temporary loss would disrupt access to the facilities on either side of Exposition. In addition, access routes across the excavation would be limited to the areas where there are currently crosswalks or pedestrians may be forced to cross the area at either end along Figueroa or Vermont. While access would be maintenance it would likely be an inconvenience to pedestrians. Over the long term, the operation of BRT or LRT in a tunnel would not affect access to the university, museums, or park in any way.

3.15.4 Cumulative Impacts

Wilshire BRT. Community facilities located along the Wilshire BRT route (where turn access will be restricted), these facilities will be vulnerable to cumulative impacts from other public works or development projects in nearby areas that would restrict traffic flow or divert traffic flow. Driver confusion and unnecessary vehicular circulation in these areas would further disrupt access to community facilities.

Exposition BRT or LRT. It is unlikely that community facilities adjacent to or near the Exposition route would be adversely affected by any combined affects of public works or development projects. Local circulation around community facilities is expected to be maintained at current levels. No cumulative adverse changes are anticipated.

3.16 Hazards

3.16.1 Introduction

This section identifies current locations within both the Wilshire and Exposition Boulevard routes that have the potential for contamination from hazardous materials. This section also includes sites with potential contamination due to the possibility of migration of contaminants from nearby hazardous waste sites.

3.16.2 Affected Environment

Certain chemical and physical properties of a substance may cause it to be considered hazardous. As defined by the California Code of Regulations (CCR), Title 22, Section 66084, a "hazardous material" is a "substance or combination of substances which, because of its quantity, concentration, or physical, chemical, or infectious characteristics, may either (1) cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible illness; or (2) pose a substantial present or potential hazard to human health or environment when improperly treated, stored, transported or disposed of or otherwise managed."

According to the California Health and Safety Code, Section 25124, a "hazardous waste" is any hazardous material that is abandoned, discarded or in storage prior to recycling. For example, excavated soil containing hazardous materials would be a hazardous waste if the concentration of contaminants exceeded specific CCR Title 22 criteria.

Project Setting

The proposed project and project alternatives travel the Wilshire Boulevard and Exposition Boulevard right-of-ways through areas containing both commercial and single/multi-family residential properties. The Exposition corridor follows the former railroad right-of-way, which includes portions of Exposition Boulevard, Jefferson Boulevard, National Boulevard, and Olympic Boulevard. Bus alternatives would not require the removal of soil or ground excavation; however, the rail alternatives would require construction activities, which could be affected by potential contamination. Underground storage tanks are of concern because of the possibility of leaks that lead to contamination of surrounding soil and groundwater.

Regulatory Agency List Review

A review of federal and state regulatory agency lists was conducted to determine if locations within the routes contain suspected hazardous waste sites.

- *CORTESE:* The California Environmental Protection Agency Office of Environmental Information has compiled a Hazardous Waste and Substances Sites List (Cortese list) which includes sites designated by the State Water Resources Control Board, the Integrated Waste Management Board, and the Department of Toxic Substances Control. The Cortese list was reviewed for any sites located within the routes. Hazardous material locations within the Wilshire and Exposition corridors found on the April 1998 Cortese list are displayed in Table 3.16-1.

TABLE 3.16-1
SITES ON CORTESE LIST WITHIN WILSHIRE AND EXPOSITION ROUTES

Site	Location	Type of Contamination
WILSHIRE ROUTE		
804 Wilshire Boulevard	Fujita Corporation, Santa Monica	Leaking Underground Storage Tank
1111 Wilshire Boulevard	Roywood Corporation/Nakano-Kia, Los Angles	Leaking Underground Storage Tank
2730 Wilshire Boulevard	Kennedy- Wilson International, Santa Monica	Leaking Underground Storage Tank
3675 Wilshire Boulevard	Arco #5355, Los Angeles	Leaking Underground Storage Tank
3855 Wilshire Boulevard	Texaco #Alex Haagen, Los Angeles	Leaking Underground Storage Tank
4180 Wilshire Boulevard	Alright Parking Lot, Los Angeles	Leaking Underground Storage Tank
8567 Wilshire Boulevard	Mobil #11-GWX, Beverly Hills	Leaking Underground Storage Tank
8833 Wilshire Boulevard	BMW of Beverly Hills, Beverly Hills	Leaking Underground Storage Tank
9777 Wilshire Boulevard	Wilshire Triangle Center, Beverly Hills	Leaking Underground Storage Tank
10950 Wilshire Boulevard	Hertz – West LA, Los Angeles	Leaking Underground Storage Tank
11800 Wilshire Boulevard	Chevron #9-7748, Los Angeles	Leaking Underground Storage Tank
12054 Wilshire Boulevard	Mobil #11-LDM, Los Angeles	Leaking Underground Storage Tank
EXPOSITION ROUTE		
445 Figueroa Street	Library Square Construction, Los Angeles	Leaking Underground Storage Tank
610 Figueroa Street	MWD Headquarters Garage, Los Angeles	Leaking Underground Storage Tank
1201 Figueroa Street	Convention Center, Los Angeles	Leaking Underground Storage Tank
2600 Figueroa Street	Shell Station, Los Angeles	Leaking Underground Storage Tank
2601 Figueroa Street	Chevron #9-3707, Los Angeles	Leaking Underground Storage Tank
2943 Exposition	GTE Plant Yard, Santa Monica	Leaking Underground Storage Tank
8520 National Boulevard	Fredrick Smith, Culver City	Leaking Underground Storage Tank
8536 National Boulevard	Hercules Incorporated Plant #3, Culver City	Leaking Underground Storage Tank

In addition to the sites identified in the Cortese List, numerous hazardous materials studies were reviewed to determine the potential for encountering hazardous materials during construction of the proposed project or project alternatives. These hazardous studies were initially conducted as part of the purchase process by the MTA of the former Exposition railroad right-of-way. These studies included the following: Asbestos Site Assessment Facility Inspections SPTCO Properties (Santa Ana, Santa Monica, and Midway Yard Facilities) (1991); Soil Chemical Testing Study National Boulevard and Hayden Street Culver City, California, (1991); Additional Site Characterization: Santa Monica Line Sites: Cabinet 2000, Main/Jefferson, Bundy Cleaners, and Santa Monica Building Materials, (1992); and Environmental Due Diligence Survey, Santa Monica Line, California, (1990). These documents were reviewed to determine the potential for encountering hazardous materials. The findings from these documents are presented in Table 3.16-2.

TABLE 3.16-2
SUMMARY OF HAZARDOUS MATERIALS DOCUMENTS FOR EXPOSITION ROUTE

Document	Buildings	Findings	Applicability to this Study
Asbestos Site Assessment Facility Inspections SPTCo Properties (Santa Ana, Santa Monica, and Midway Yard Facilities)	- Direct Mail Advertising 2133 Bundy Dr. - Psychic Boutique Corinth Ave./Pico Ave.	No materials surveyed displayed significant ACBM damage or potential for friable material release. Trace asbestos concentrations (.1% Crysotile) were identified within vinyl floor tiles and associated mastic.	Buildings outside of Exposition right-of-way. No effect anticipated.

TABLE 3.16-2
SUMMARY OF HAZARDOUS MATERIALS DOCUMENTS FOR EXPOSITION ROUTE

Document	Buildings	Findings	Applicability to this Study
Soil Chemical Testing Study National Boulevard and Hayden Street Culver City, California	Site located at corner of National and Hayden in Culver City. Southeast corner of National & Hayden, brick warehouse with old RR spur.	Soil samples were found to contain high concentrations of TPH, toluene, and xylene. Recommend that soil be removed, manifested, and transported to a disposal facility. Some additional testing may be required for admittance into respective facilities.	Site is adjacent to where reconstruction of National Boulevard would occur and as such this reconstruction may encounter some of the contaminated soils. Study recommend that soil from this site be removed, manifested, and transported to a disposal facility and that some additional testing may be required for admittance into respective facilities.
Additional Site Characterization Santa Monica Line Sites: Cabinet 2000, Main/Jefferson, Bundy Cleaners, and Santa Monica Building Materials	Cabinet 2000 - Washington & Exposition	Based on limited extent and low levels of contamination found at site, levels of aromatic compounds discovered in single surface sample are of minor concern in regards to possible groundwater contamination. Do not recommend further investigation or remediation at this site.	Site is outside of Exposition right-of-way and not anticipated to be used for the proposed project alternatives. In addition, study concluded that further investigation or remediation was not needed at this site.
	Himco Security Products Main & Jefferson (downtown). Northeast corner of Main & Jefferson	PCE was detected. Recommend further investigations be performed at site to determine lateral and vertical extent of soil contamination. Additional borings should be drilled to a minimum depth of 20 feet and soil samples should be collected and analyzed at surface. Remediation methods or costs cannot be recommended until after additional investigations. Do not suspect groundwater contamination.	Outside of study area. No effect anticipated.
	Bundy Cleaners	No groundwater contamination at this site revealed in groundwater samples.	Site is outside of the Exposition right-of-way, therefore, no effect anticipated.

TABLE 3.16-2
SUMMARY OF HAZARDOUS MATERIALS DOCUMENTS FOR EXPOSITION ROUTE

Document	Buildings	Findings	Applicability to this Study
	SM Building Materials, Exposition & Bundy	After illegally discharging oil onto property, City of SM directed SM Building materials to remediate contaminated soil. City has stated, as of 8/3/91 that further remediation is not required. No further investigation or remediation necessary.	Some portion of tested soil may be encountered during construction of the Exposition (Full Length) Alternatives, however, since the City of Santa Monica has stated that further remediation is not required, no effects are anticipated.
	Bergamot	Two sites where groundwater contamination is considered to be present beneath the ROW and one non-operating property where groundwater contamination has been detected.	Even though this site is proposed as a park-and-ride lot, it is not anticipated that groundwater would be encountered during construction. Therefore, no effects are anticipated.
	Numerous soil stockpiles	Numerous soil stockpiles and some drums are present in ROW. Many of the drums are located in fenced areas, which are most likely leased properties. Stockpiles and drums need to be managed as hazardous wastes unless they are tested or their source is known.	These stockpiled sites are within the right-of-way. Therefore, as recommended by this study, many of the drums are located in fenced areas, which are most likely leased properties. Therefore, these stockpiles and drums need to be managed as hazardous wastes and should be tested unless their source is known.
	Numerous sites with oil from cars/trucks	Numerous sites where it appears that oil from cars or trucks has been spilled into ROW. The vertical extent of these stained areas is anticipated to be small. The larger stained areas may be from other sources. Of concern in these larger stained areas is the potential presence of other chemicals. PCBs which have been encountered in waste oils could be present in some of the stained areas.	Further investigation of these numerous stained sites is recommended to determine if these soils are contaminated prior to construction of the proposed Exposition alternatives.

TABLE 3.16-2 SUMMARY OF HAZARDOUS MATERIALS DOCUMENTS FOR EXPOSITION ROUTE			
Document	**Buildings**	**Findings**	**Applicability to this Study**
	Other sites where fluids have leaked or are continuing to leak into corridor.	If hazardous materials are present in fluids or have leaked from the tanks or clarifiers they would be present in subsurface beneath ROW. Number of areas where it is suggested that additional data be obtained (Tables 5A & 5B)	Further investigation of these sites is recommended to determine if these soils are contaminated prior to construction of the proposed Exposition alternatives.
		Two sites where unpermitted storage tanks are on adjacent properties, two sites identified from air photos where disposal pits were present and three sites where stains were noted.	Further investigation of these numerous stained sites is recommended to determine if these soils are contaminated prior to construction of the proposed Exposition alternatives.
Source: Compiled from various hazardous materials documents at MTA, 2000.			

3.16.3 Impact Assessment and Mitigation Measures

Standards of Significance

A significant impact would occur if hazardous materials are encountered during excavation of sites during the construction phase of the proposed project or project alternatives.

Methodology for Impact Evaluation

The methodology used to identify the potential impact was to identify the location of hazardous sites and compare their locations with the routes of the proposed project and project alternatives to determine if, during construction, the materials would be exposed.

Impacts

No Action Alternative (Baseline)

As discussed in Section 2 of this EIS/EIR, the No Action Alternative involves primarily increases to the bus operations fleet and minor transit service restructuring. It would not involve the construction of a project and therefore exposure to hazardous materials would not result. No impact would occur.

Transportation System Management (TSM) Alternative

As described in Section 2 of this report, the TSM Alternative would largely involve operational and route restructuring improvements along with extensions of the MTA Rapid Bus service and corridors. No construction is anticipated for this alternative and therefore the alternative would not be exposed to hazardous materials. No impact would occur.

Alternative 1: Wilshire BRT (Baseline Median-Running)

From Table 3.16-1, several sites containing leaking underground storage tanks were identified along the Wilshire route. However, these sites are all outside of the existing Wilshire Boulevard street right-of-way. Implementation of the Wilshire BRT Alternative would occur within the existing street right-of-way and would not require substantial excavation during the construction of this alternative (raised medians would be demolished and the roadway crown would be regarded). As a result, it is not anticipated that hazardous materials would be encountered during construction of this alternative and no significant impacts are anticipated.

Alternative 1A: Wilshire BRT (Median Adjacent Design Option)

Because improvements would be made within the existing Wilshire Boulevard right-of-way, no impacts anticipated. The only potential for impacts would result from the MTA's acquisition of an industrial or commercial property for off street parking that may have contamination. Generally, impacts would be less than significant.

Alternative 1B: Wilshire BRT (Curb Adjacent Design Option)

Impacts would be similar to Alternatives 1 and 1A.

Alternative 2: Wilshire BRT and Exposition BRT (Full Length)

This alternative includes the potential impacts associated with the Wilshire BRT Alternative and Exposition BRT Alternative. The potential impacts for the Wilshire BRT Alternative are discussed above and it was determined that no significant impacts are anticipated for this route.

The primary hazardous materials concerns for this component of the alternative are conditions within the former railroad right-of-way where the exclusive busway would be constructed. Environmental reviews of the right-of-way indicate there are instances of stained and contaminated soil, storage spills and structures containing asbestos. Prior to construction, these hazardous conditions would be corrected following appropriate state and federal procedures, as required by Mitigation Measure 3.16-1:

- *Mitigation Measure 3.16-1:* Prior to construction, the LACMTA shall conduct a comprehensive review of current conditions in the Exposition railroad right-of-way and specifically define remedies for hazardous conditions prior to the construction of the guideway alignment or associated station areas.

It should also be noted that the replacement parking strategy to be implemented in conjunction with the Wilshire BRT alternative may require the acquisition of developed properties. If these properties are industrial in nature, specific consideration will need to be given to contamination and spills on the affected sites that could cause potentially significant impacts. If structures acquired have been built using asbestos, then further consideration will need to be given to removal of the asbestos following appropriate procedures and regulations, as required by Mitigation Measure 3.16-2:

- *Mitigation Measure 3.16-2:* For structures to be acquired, an evaluation of asbestos hazards shall be conducted. There are five types of response actions recognized for the control of an asbestos-related hazard. They are removal, enclosure, encapsulation, encasement, and operations and maintenance. In the event of demolition or renovation operations involving asbestos containing floor tiles, precautions should be implemented to minimize activities, which may cause fiber release. During demolition operations, materials may be uncovered that are different from those accessible during initial assessments. Additional sampling to identify asbestos-containing materials may be needed during such activities. Personnel in charge of demolition shall be trained in the proper identification of potential asbestos-containing materials and other potentially hazardous materials, which may be uncovered during demolition activities. Additional sampling and laboratory analysis should be performed to determine the composition of these materials.

Alternative 2A: Wilshire BRT and Exposition BRT (MOS)

This alternative includes the potential impacts associated with the Wilshire BRT Alternative and Exposition BRT MOS Alternative. The potential impacts for the Wilshire BRT Alternative are discussed above and it was determined that no significant impacts are anticipated for this route.

For the Exposition BRT MOS portion of this alternative there are former railroad right-of-way significant hazardous materials impacts that primarily pertain to soil contamination, spills and asbestos in older structures. Mitigation of these potential hazardous conditions prior to construction is necessary to be consistent with local and state regulations.

Alternative 3: Wilshire BRT and Exposition LRT (Full Length)

This alternative includes the potential impacts associated with the Wilshire BRT Alternative and Exposition LRT Alternative. The potential impacts for the Wilshire BRT Alternative are discussed above and it was determined that no significant impacts are anticipated for this route.

The Exposition LRT portion of this alternative would have similar concerns to the Exposition BRT portion discussed above. Mitigation will be required for soil, storage and asbestos conditions in the former railroad right-of-way.

In addition to hazardous materials concerns, the introduction of the LRT mode will also introduce new electromagnetic field (EMF) sources associated with the overhead electrical power system used to propel the vehicles.

Electromagnetic fields (EMFs) are generated from electrical power facilities and appliances. An EMF is an invisible, low frequency radiation that is emitted from electrical sources. Common sources include power lines, hair dryers, microwave ovens, video terminals, electric blankets, and other appliances. High voltages generate the electrical fields, while the movement of these voltages in wires generates the magnetic fields. An EMF weakens as the field extends from the source.

The overhead catenary system and traction power substations are the sources of EMFs from the LRT alternatives. The LRT uses 600 volts of direct current (dc) (0.6kV). For comparison, overhead power lines use a much higher voltage (400 kV). Based on this information that the EMFs produced by LRT systems are relatively weak, it is not anticipated that EMFs would create an adverse impact or an increased risk to human health; however, implementation of Mitigation Measure 3.16-3 will ensure that impacts remain less than significant:

- *Mitigation Measure 3.16-3:* Residences, schools, hospitals, day care facilities, convalescent homes, and other similar sensitive receptors that are located within 100 feet of the catenary centerline shall be specifically evaluated for potential EMF levels based on the power requirements of the LRT system. Projected levels shall be compared with International Radiation Protection Association (IRPA) guidelines. In the unlikely event that these guidelines would be exceeded, mitigation shall be implemented to ground or block fields or alter the LRT power requirements.

Alternative 3A: Wilshire BRT and Exposition LRT (MOS)

This alternative includes the potential impacts associated with the Wilshire BRT Alternative and Exposition LRT MOS Alternative. The potential impacts for the Wilshire BRT Alternative are discussed above and it was determined that no significant impacts are anticipated for this route. Because portions of the former railroad right-of-way would be used in the MOS segment mitigation of contaminated conditions and spills would be required.

Maintenance Yard

As discussed in Section 2 of this report, the MTA is considering candidate maintenance yard site locations for BRT operations. Six candidate sites are under consideration. Hazards associated with each of these sites are discussed below:

Northwest Corner of Chavez and Mission. The site is not listed as a Superfund Site. Auto salvage and auto repair activities as well as heavy truck use of site strongly suggests that soil contamination may be an issue. There is a potential for a significant impact at this location.

Existing MTA Division 1 (Alameda and 6th). Vehicle maintenance activities have occurred on this site for many years. In addition there are underground tanks. The potential for soil contamination on this site is relatively high. There is a potential for a significant impact at this location.

Northeast Corner of Alameda and Washington. The site is currently being used as a truck terminal and the storage of truck trailers. It is expected that the continued presence of trucks on this site over a period of time would be a source of soil contamination. The potential for soil contamination on this site is relatively high. There is a potential for a significant impact at this location.

Southeast Corner of Alameda and Washington. This site was used for the maintenance and storage of buses by a private company. It is anticipated that there will contamination related issues associated with the repair facilities as well as the parking areas. Another portion of the site is used for truck rentals. Again there is a likelihood of contamination associated with this storage use. The adjacent area to the south includes portion of a railroad right-of-way as well as a metal salvage/fabrication shop. The extensive use of metals on this site strong suggests soil contamination will be an issue, and there is a strong likelihood that site remediation would be required. There is a potential for a significant impact at this location.

Exposition ROW (Hooper to Central). A review of the assessments prepared at the time the MTA acquired the right-of-way from Southern Pacific there were no specific indications that the proposed site posed soil contamination concerns. No significant impacts are anticipated.

Existing MTA South Park Shops (54th and Avalon). As an existing MTA facility that it is involved with the service and repair of buses there is a likelihood of contamination associated with site. In addition, underground tanks on the site may also pose a hazardous materials risk. There is a potential for a significant impact at this location.

Subway Design Option at USC/Exposition Park (for Alternatives 2, 2A, 3 and 3A)

The excavation of a tunnel for BRT or LRT would pass through an area that has been evaluated as part of the City of Los Angeles North Outfall Sewer project. Borings taken in the vicinity of the proposed tunnel do not indicate the presence of hazardous materials or gases. No significant impacts are anticipated.

3.16.4 Cumulative Impacts

Wilshire BRT. Because hazardous materials effects are highly site specific it is not anticipated that there would be a potential combined adverse impacts from the proposed project and other public works or construction activities along Wilshire Boulevard.

Exposition BRT or LRT. It is not expected that soil contamination or the removal of asbestos from structures in the right-of-way would have a combined impact with other future land development or public work projects taking place in the vicinity. In addition, the legal requirement for remediation would eliminate the potential for a combined effect with other projects in the area.

3.17 Cultural Resources

3.17.1 Introduction

This section describes the potential impacts to cultural resources that could result from implementation of the alternatives under consideration for the Mid-City/Westside Transit Corridor Project. This analysis incorporates technical reports prepared for this EIS/EIR for paleontological, archaeological, and historic resources. Additionally, the Native American Heritage Commission (NAHC) was consulted, and the Native American individuals and organizations were contacted per the NAHC's request. Letters were sent to these individuals and organizations on November 6, 2000, and at the time of preparation of this report, no responses have been received.

3.17.2 Affected Environment

Definition of the Area of Potential Effects

The Area of Potential Effects (APE) definition used for the project is consistent with that used in previous surveys for the Metro Rail Project. For historic and architectural resources, it includes all parcels located above off-street tunnel configurations, and all structures within the first tier of structures adjacent to the project alignment, stations, subway or open cut construction areas, or areas proposed for acquisition. Whenever reasonable, property lines or street rights-of-way (ROWs) were used to establish the APE boundary. For archaeological resources, it is the area which would be disturbed during construction of the undertaking.

Paleontological Resources

Implementation of Alternatives 1, 1A, or 1B would not cause ground disturbance of sufficient depth to affect paleontological resources. Alternatives 2, 2A, 3, and 3A, however, include a proposed subway design option for portions of the Exposition Alignment adjacent to the University of Southern California (USC). Implementation of these measures would result in substantial excavation, which could affect paleontological resources.

As mapped by Dibblee (1992), the USC campus and vicinity are underlain by Holocene alluvium (unit Qa), which is composed of clay, sand, and gravel. Presumably, the alluvium includes strata of late Pleistocene age at depth. However, at or near the surface, the younger alluvium is probably too young to contain remains old enough to be considered fossilized and, therefore, there is probably only a low potential for any fossil remains or previously unrecorded fossil site being encountered by shallow earth-moving activities in areas underlain by this rock unit.

However, the fossil occurrences from the younger alluvium, such as those in the vicinity of USC, are of high scientific importance because they have allowed determinations of the ages of their respective fossil-bearing rock units, reconstructions of the depositional paleoenvironments represented by the sediments comprising these rock units, and documentation of the paleoclimates of the region during deposition of the sediments. Moreover, some of these occurrences are also important because they represent time and/or geographic range extensions (including first reported fossil occurrences) for their respective animal and plant species.

Fossil occurrences in similar geological units, as well as at nearby areas, such as downtown Los Angeles, Union Station, Vernon, El Sereno, and Universal City/North Hollywood, suggest that there is a moderate to high potential for additional, similar fossil remains being encountered in the younger alluvium present in the APE.

Historical and Potentially Historical Properties Identified In The APE

A review of archival records and background literature, and a preliminary field survey have identified two types of cultural resources (King 1998:221-222) in the APE. These types include:

- Historic Properties, which are places included in or eligible for the National Register of Historic Places (NRHP) by virtue of their historical, archaeological, architectural, engineering, or cultural significance; and
- Community cultural norms, values, and beliefs, and their expressions in the ways people work, play, relate to one another, organize to met needs, and generally participate in society. This kind of resource, which may or may not involve historic properties or some other kind of resource, or use of the natural environment, is subject to The National Environmental Policy Act (NEPA).

In summary, 164 resources have been identified in or within ¼ mile of the APE for the various alternatives. Tables 1.0 and 1.2 of the Cultural Resources Technical Report list the properties, addresses, APNs, dates of construction (where appropriate), and NRHP status (where applicable). Table 3.17-1 provides a breakdown of these resources:

TABLE 3.17-1
SUMMARY OF CULTURAL RESOURCES SITE TYPES

	Site Type		
Alignment/No. of Sites	**Known Archaeological Sites**	**Potentially Eligible Buildings**	**Potentially Ineligible Buildings**
Wilshire Alignment			
Mid City LA	1	48	4
Beverly Hills	0	18	1
West LA	2	15	0
Santa Monica	0	10	5
Subtotal	*3*	*91*	*10*
Exposition Alignment			
Los Angeles	8	34	3
Culver City	1	7	0
West LA	0	1	0
Santa Monica	0	2	4
Subotal	*9*	*44*	*7*
TOTAL	**12**	**135**	**17**

Source: Greenwood & Associates, 2000

In addition to the structures and archaeological sites listed above, many of the electroliers and other fixtures (such as streetlamps) along Wilshire Boulevard may have been installed prior to 1950, and may, therefore, be considered potentially historic. Additionally, the Southern Pacific Railroad/ Pacific Electric Railway lines and ROWs in the Exposition Alignment have been identified by the California State Historic Preservation Officer as eligible for the NRHP.

Historical Context of the APE

Prehistoric settlement in the Los Angeles basin appears to have been patterned in relation to environmental attributes, which favored subsistence practices, and may represent either villages or temporary/seasonal camps of special functions. Native American sites dependent on harvesting marine foods formed a band along the Los Angeles Basin coast north from the Ballona wetlands. Inland sites were often distributed near springs or seeps, or in proximity to oak groves. Other sites, many undocumented, were located to take advantage of desirable faunal, mineral, wild plant, and seed resources.

With the arrival of the Spaniards and formation of the missions, the area was soon depopulated. The Spanish plan for empire expansion was to convert local populations to a Hispanicized way of life rather than to populate a territory with immigrants. Once the Spaniards established their hegemony in the area, their interactions with local populations led to an end of hunter-gatherer lifeways. A great deal of indigenous knowledge persisted in Native American groups until well into the twentieth century, but their lives had been substantially altered.

Los Angeles was established near the Los Angeles River in 1769. The settlement was close to a ford and a place to ascend the bluffs on the east side of the river, the direction of Mission San Gabriel. The core of the settlement was on the lower river terraces, with the lowest terraces and floodplain serving as fields. Water was delivered by gravity flow from the river through a series of ditches to the settlement and fields. As time passed, settlement spread upslope and westward away from the periodic flooding.

The passing of California from Spanish to Mexican rule in 1847 did not alter the basic social fabric at first, but secularization of the missions in 1833-1834 and the increasing numbers of private ranchos had changed the economic relations among classes. Neophytes released from the missions and newcomers from Mexico became wage-earners of lower status, while the landholding rancheros and military officers constituted an elite. Despite social distinctions, material culture differences between the groups were relatively modest.

In 1848, gold was discovered in the Sierra Nevada, which prompted a population influx from the United States, Europe, Central America, and Asia in 1849 and soon led to statehood in 1850. San Francisco was the boom town that supplied the gold fields, but the Los Angeles economy benefited, too, through sales of local cattle to miners and increasing settlement and trade. As the Gold Rush waned, Los Angeles grew with the arrival of former miners.

The new settlers arriving during and after the Gold Rush were a multicultural mélange including German Jews, French, and other western Europeans. After completion of their work on the railroads, Chinese joined the large numbers of settlers from other states and the remaining Californios and Native Americans. All tended to settle in proximity to groups sharing national, ethnic, linguistic, and social affinities.

When the Southern Pacific railroad came to Los Angeles in 1876, its tracks were laid on the flats near the river. A whole complex of warehouses for storing and loading merchandise grew up on adjacent streets. Commercial enterprises such as barbershops, saloons, restaurants, boardinghouses, and brothels in the same area served the workers and railroad men.

By the 1880s, suburban development began on the bluffs above the river. New housing tracts were served by street railways, and business establishments followed along transportation corridors. Cemeteries were founded on what was vacant land. Residents of the area worked in the growing industrial zone between the heights and downtown. This area was peripheral to the town center, and housing continued to spread to the east as land was platted and subdivided. At first, houses were separated by open tracts, but with later construction, vacant lots were filled in and settlement continued to expand to the east.

After the advent of the automobile, despite the continued service of streetcars, many homeowners began to buy automobiles and house them in garages on their property.

While evidence of early land use and cultural patterns has become part of the architectural and archaeological record, many land use and cultural patterns established by the 1880s have persisted. An example of such a pattern is commercial development along east-west arteries serving adjacent residential neighborhoods.

As noted above, the city grew outwards from the original core settlement, as shown by period maps. Most growth after 1849 was planned, in the sense that the street grid was surveyed and lots marked, channeling growth along established corridors. The first official map of the city was created in 1849 (Ord and Hutton 1849) and centered on the plaza area, the core of settlement at that time. Tracts surrounding the core, available for sale but not yet subdivided, were bounded by major cross streets. In 1857, Henry Hancock surveyed the city lands beyond Ord's map, all the way to Indiana Street, the city boundary. He divided the land into 35-acre lots in groups of eight, separated by streets in a grid (Hancock 1858 in Harlow 1976:77). A re-survey in 1867 showed that most of the land west of the river was owned, but not improved.

<u>**Los Angeles and Independence Railroad**</u>

The Southern Pacific Railroad (SPRR) entered the Los Angeles area in 1873 and gained a monopoly of port facilities at Wilmington, which it was able to retain for two decades (Robinson 1985:90). Since SP was the only rail line at the time, and Wilmington/San Pedro was the only significant harbor in operation at the time, SPRR had a virtual monopoly on transportation of harbor freight to Los Angeles and charged high freight rates which local merchants were obliged to accept. In an effort to cash in on land development and to break the transportation monopoly, several investors in the early 1870s bought portions of the Rancho La Ballona, Rancho San Vicente y Santa Monica, and Boca de Santa Monica and platted the town of Santa Monica.

Senator John P. Jones is universally regarded as the founder of Santa Monica (McGroarty 1921:886). Jones and others platted the town and organized the Los Angeles & Independence Railroad (LA&IRR) in 1875. The new company immediately began construction of a pier, 1,700 feet in length. Senator Jones' intent was to carry his rail line from Los Angeles to Independence, where he owned the Panamint mines, but this never occurred (Storrs 1974:6). It was also proclaimed that Jones and Baker (his partner) would build a railroad toward the east that would break the SPRR monopoly in southern California (Santa Monica 1974:7).

Harris Newmark, merchant, was the first to bid for a lot in Santa Monica at $300 (Robinson 1959:10). In 1875, Santa Monica had 1,000 people, 160 houses and half as many tents. Tracks for the Los Angeles & Independent Railroad had been laid from the ocean to Los Angeles and a wharf was in operation (Basten 1974:5). The line was constructed as a single-track standard-gauge steam railroad (Pacific Electric Engineering Department 1914:341). The distance from Los Angeles to the Ocean Park depot was 19.2 miles (*Interurbans* 1975:52). The LA&IRR had a depot at Fourth and San Pedro in Los Angeles (Post 1989:35).

In addition to the LA&IRR, there were numerous trolley and street car lines developing in Los Angeles. One of these, the San Pedro Street line, unlike any of the other three pioneers, ran on standard gauge track, and in effect constituted an extension of the Los Angeles & Independence through town (Post 1989:35). On March 1st, work was commenced on the San Pedro Street Railway, which in time was extended from the Santa Monica station to the Plaza, via San Pedro, Los Angeles, Arcadia and Sanchez Streets. The gauge was that of the Los Angeles & Independence Railway, thus permitting freight cars to be hauled to the center of the city; businessmen looked upon the new road as a boon (Newmark 1930:488).

By 1877, however, the LA&IRR proved to be an unprofitable venture for Jones and his partners due to constant freight rate wars with the SPRR. In July, it was sold to the Central Pacific/Southern Pacific organization which immediately increased freight rates between Santa Monica and Los Angeles thus making the Wilmington seaport more favorable to shippers than Santa Monica (Santa Monica 1974:8).

Southern Pacific Railroad

In 1878, SPRR condemned and partially dismantled the wharf of the LA&IRR. In addition, the depot was removed from the wharf and relocated close to the present location of the city hall (Storrs 1974:11). The last steamer to dock at Santa Monica was, ironically enough, the *Senator*, which arrived in September 1878 (Marquez 1975:24). As a consequence the population of Santa Monica dwindled to 350 people (Basten 1974:12). When the LA&IRR tracks were connected to those of the SPRR, the depot downtown at 4th and San Pedro was superfluous and SPRR sold the station (Marquez 1975:24).

Down through the 1880s, SPRR had shipped through San Pedro. It had also eliminated all competition by acquiring the San Pedro Railway, securing the Wilmington tidelands, purchasing the LA&IRR, and closing its wharf at Santa Monica. The Los Angeles Terminal Railway - an eastern syndicate presumably fronting for the Union Pacific - built a line from Los Angeles to San Pedro and bought nearby Terminal Island. By 1891, it competed directly with the SPRR (Fogelson 1993:110).

The competition of the Los Angeles Terminal Railway at San Pedro prompted SPRR to look for another port where it could dominate freight traffic and at the same time eliminate San Pedro, its new competition, as the de facto port of Los Angeles. To this end, SPRR bought the Santa Monica ocean front right-of-way, again from John Jones, and proceeded to build "a massive wharf stretching far out into the sea from its rail line at Santa Monica" (Deverell 1996:100). This "long wharf", as it came to be called, was a 4,500 foot engineering triumph (Deverell 1996:100). The wharf was serviced by an expanded rail line extending to the ocean from the old terminus of the LA&IR.

A protracted battle was fought over which port was to become the "Port of Los Angeles" and in 1897, San Pedro was declared the official port. In the interim, streetcar service started to supplant the steam trains which had made four round trips daily between Santa Monica and Los Angeles. By the early 1900s, service to Santa Monica was provided by both Pacific Electric and the Los Angeles Pacific (Storrs 1974:20). Southern Pacific, after losing its monopoly for a new port, slowly abandoned its "Long Wharf" in Santa Monica and decreased service along its Santa Monica branch.

Pacific Electric, The Santa Monica Air Line

At one time it had been generally assumed that Henry E. Huntington was destined to succeed his uncle as head of the Southern Pacific, but after Collis P. Huntington's death in 1900, a controlling faction of the SPRR leadership blocked Henry's ambition. Prior to this time, Henry had developed a majority interest in the Pacific Electric (PE) streetcars, which controlled a significant portion of the Los Angeles light rail franchise. Huntington went on to take a commanding lead in this realm, and by the end of 1902 had the construction of several lines well under way (Post 1989:141).

While keeping a seat on the SPRR board, Henry Huntington set PE on a course directly contrary to the interest of the railroad. E. H. Harriman, the new Southern Pacific president, knew that the electric interurban offered conveniences that no steam road could match and took steps to protect his company (Post 1989:143). Harriman bought a sizable interest in PE and also bought a competitive line to Huntington's which eventually forced the latter to agree to come to terms with SPRR. An agreement was eventually reached in 1903, which allowed Huntington to continue, but on a much reduced scale. In 1908, Huntington gave up active management of the Pacific Electric, and two years later he relinquished his share to the SPRR in return for full ownership of the Los Angeles Railway (Post 1989:145-147).

A period of expansion of beach towns began at the turn of the century in southern California, aided by the extension of electric railroads (Pennington and Baxter 1976:23).

Promotional efforts brought about renewed interest in Santa Monica as a residential and resort community rather than as a commercial center. The Santa Monica branch, now part of the PE Line, permitted residents to live in Santa Monica and work in Los Angeles. The electric lines contributed substantially to the continued growth of Santa Monica, Culver City, and other beach cities by offering low fares and reliable service (Pennington and Baxter 1976:23).

Southern Pacific merged all the numerous southern California interurban electric railway holdings into one consolidation and in 1911, it created the Pacific Electric Railway Company. The old LA&IRR line became the Santa Monica Air Line route (Marquez 1975:113; Storrs 1974:20). Topographic maps of 1921 and 1926 of Santa Monica depict the PE line along the same alignment as the LA&IRR. The electric railway's fortunes markedly improved during southern California's subsequent boom. Between 1919 and 1923, patronage advanced rapidly and operating revenue rose substantially on both the LA&IRR and the Pacific Electric (Fogelson 1993:171). In addition to passengers, the line had a thriving freight business.

Pacific Electric was instrumental in the development of crossing signaling devices and developed the "wig-wags." Wig-wags mounted on telephone poles at major intersections would clang a warning of approaching PE cars.

Although the SPRR supported the PE through the 1930s, it was clear by now that the interurban system had failed as a transit enterprise. For the electric railways here and elsewhere in the United

States, the Great Depression was catastrophic (Fogelson 1993:183). During the 1930s, SPRR used the line to display new locomotives at Exposition Park (Cranston, personal communication 1999).

In the late forties, PE requested permission to raise its fares to cover rising costs. The California Public Utilities Commission, however, ordered the railway to upgrade its equipment before instituting fee increases. The PE management, after much thought, eventually decided to eliminate its passenger rail service altogether. After abandonment of passenger service in 1953, trolley wire was removed and diesel locomotives took over all freight movements (*Interurbans* 1975:52-53). Ultimately, the PE sold its passenger service in 1953 to the Metropolitan Coach Lines, a company that mainly operated buses in southern California. That corporation ran the PE at a loss for five years before selling out to the state-owned Metropolitan Transit Authority, which formally ended all rail service in 1961 (Bottles 1987:238-239). Southern Pacific formally abandoned the line sometime in 1993 when it was sold to the Los Angeles County Metropolitan Transit Authority.

Significance of the Cultural Resources in the APE

The potential significance of the cultural resources in the project area is connected primarily to the urban and suburban growth of Los Angeles. The city's urban growth has been influenced by broad historic trends in urban economy over the past two centuries, which interacted with specific characteristics of the local natural, social, and built environments. Since the founding of the pueblo, the multicultural composition of the population, changing with patterns of migration and immigration, has left an impression on the city and its surroundings. The evidence is visible, in the form of structures and wall art, and is also obscured, in the subsurface archaeological remains.

Intensity of use has affected the character of the areas crossed by the Project Corridor. The environmental issues for cultural resources include consideration of both the built environment and the archaeological record, both prehistoric and historic. Prehistoric archaeological remains in the Study Area are almost completely unknown because of the dense early Euroamerican settlement that would have obscured the surface indications. At this date only subsurface testing will reveal their presence or absence; a testing plan can be developed to take into account favorable environmental factors such as elevation and distance to water, and the historical maps and documents.

One of archaeology's strongest contributions to understanding the historical past is describing the cultures of people who left scant written records. Typically, such people are the working classes and social groups marginal to mainstream society, who did not leave abundant written records of their own. Material culture, the remains people left in the archaeological record, can clarify our understanding of how people lived, what they ate, how they prepared foods, how much disposable income they had, how acculturated they were to the Euroamerican lifestyle, relations with other groups, and other questions not easily answered in any other way. The Mid-City/Westside Corridor is an important laboratory for inquiries such as these; an example of previous work of this type was the excavation and publication of material on the first Los Angeles Chinatown (Greenwood 1996).

The built environment amplifies historical and archaeological research to address different questions. Architectural style reflects not only social and economic choices by individual builders; it can reveal a great deal about what people thought about proper behavior and the loci for activities of different types (Deetz 1977). This is true of dwellings, commercial or retail buildings, and community facilities such as churches and fraternal halls.

The Study Area illustrates the strong American pattern of single-family detached dwellings prevalent through the middle of the twentieth century, nearly always of wood frame construction. These residences reflect trends in style, seen in the Queen Anne style of the 1890s, the Craftsman bungalows of the early twentieth century, the pre-World War II Mission Revival and other revival styles, and the Frank Lloyd Wright-influenced ranch style of the post-war period. Commercial architecture shows differences from dwellings; historic enterprises in the Study Area were frequently constructed of brick, often two stories in height. Unlike dwellings, which were set back from the street behind a fence demarcating the property, commercial structures were built to meet the property lines, with the entry on the main street. This maximized floorspace inside and made access easy for pedestrians and shoppers. Commercial architecture can demonstrate the material correlates of marketing and consumer behavior.

The scope of this report does not include archaeological testing and standing structures were only spot-checked without in-depth documentary research. When the final transportation route through the Mid-City/Westside Corridor has been selected, formal determinations of eligibility will be needed to identify significant resources where impacts may warrant mitigation.

3.17.3 Impact Assessment and Mitigation Measures

The identification process seeks first to locate and define what cultural resources are within the area of potential effects. The second step is to evaluate the significance of the identified cultural resources (Section 3.17.2). If MTA finds that there are historic properties which may be affected by the undertaking, the agency applies the criteria of adverse effect.

Criteria Of Adverse Effect (or Standards of Significance)

An adverse effect is found when an undertaking may alter, directly or indirectly, those 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.

Adverse effects on historic properties include, but are not limited to:

- Physical destruction of or damage to all or part of the property;
- Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation and provision of handicapped access, that is not consistent with the Secretary's Standards for the Treatment of Historic Properties (36 CFR part 68) and applicable guidelines;
- Removal of the property from its historic location;
- Change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance;

- Introduction of visual, atmospheric or audible elements that diminish the integrity of the property's significant historic features;
- The agency official may propose a finding of no adverse effect if the undertaking is modified or conditions are imposed to avoid adverse effects (36 CFR 800.5 (b)). If avoidance is not possible, then the agency official shall consult further to resolve the adverse effect pursuant to 36 CFR 800.6. This consultation would occur with the California State Historic Preservation Office (SHPO).

Under CEQA, demolition, destruction, relocation or alteration of a resource or its immediate surroundings, such that the significance of the historical resource would be materially impaired, would result in a substantial adverse change, and would result in a significant impact. As stated above, adverse effects to architectural resources can be resolved under the National Historic Preservation Act (NHPA), and would therefore be considered significant but mitigable under CEQA for the purposes of this analysis. Potential impacts to paleontological resources and archaeological sites can also be mitigated to a less than significant level through monitoring and scientific data recovery. These mitigation measures are described below, as appropriate.

Impacts

No Action Alternative (Baseline)

Direct Effects on Paleontological Resources. As discussed in Section 2.0 of this report, the No Action Alternative would not entail physical changes to the corridor area, and would focus on operational bus improvements, such as an increase in fleet size. Buses would continue to operate along city streets and there would be no effects outside of these ROWs. This alternative would have no impact on paleontological resources.

Direct Effects on Archaeological Resources. As discussed in Section 2.0 of this report, the No Action Alternative would not entail physical changes to the corridor area, and would focus on operational bus improvements, such as an increase in fleet size. Buses would continue to operate along city streets and there would be no effects outside of these ROWs. This alternative would have no impact on archaeological resources.

Direct and Indirect Effects on Historical Resources. As discussed in Section 2.0 of this report, the No Action Alternative would not entail physical changes to the corridor area, and would focus on operational bus improvements, such as an increase in fleet size. Buses would continue to operate along city streets and there would be no effects outside of these ROWs. This alternative would have no impact on historical resources.

Transportation System Management (TSM) Alternative

Direct Effects on Paleontological Resources. Similar to the No Action Alternative, the TSM Alternative would not entail physical changes to the corridor area, and would focus on operational bus improvements, such as an increase in fleet size and reconfiguration of routes. Buses would continue to operate along city streets and there would be no effects outside of these ROWs. This alternative would have no impact on paleontological resources.

Direct Effects on Archaeological Resources. Similar to the No Action Alternative, the TSM Alternative would not entail physical changes to the corridor area, and would focus on operational bus improvements, such as an increase in fleet size and reconfiguration of routes. Buses would continue to operate along city streets and there would be no effects outside of these ROWs. This alternative would have no impact on archaeological resources.

Direct and Indirect Effects on Historical Resources. Similar to the No Action Alternative, the TSM Alternative would not entail physical changes to the corridor area, and would focus on operational bus improvements, such as an increase in fleet size and reconfiguration of routes. Buses would continue to operate along city streets and there would be no effects outside of these ROWs. This alternative would have no impact on cultural resources.

Alternative 1: Wilshire BRT (Baseline Median-Running)

Direct Effect on Paleontological Resources. Grade preparations for the Wilshire BRT alternative would involve excavation into native soil that could reach depths of 18 to 24 inches below the ground surface. Additionally, excavations for caissons for aerial structure supports could reach depths of several feet in native soils. Such excavation may result in alteration, removal, and destruction of paleontological resources that could be present in the Quaternary alluvium (Qa) that underlies Wilshire, as well as USC and the Exposition Park area. This would represent a significant, mitigable impact: implementation of Mitigation Measure 3.17-1 would reduce this impact to a less than significant level.

- *Mitigation Measure 3.17-1 Monitoring and Scientific Recovery of Paleontological Resources:* Prior to any earth moving at the project site, a qualified vertebrate paleontologist approved by the Los Angeles County Museum of Natural History – Vertebrate Paleontology Section (LACMVP) will be retained by the MTA or its designated contractor to supervise the mitigation program, which shall consist of the following:

    1. The paleontologist will develop a storage agreement with the LACMVP to allow for the permanent storage and maintenance of any fossil remains recovered at the project site as a result of the mitigation program, and for the archiving of associated specimen data (taxon, element) and corresponding geologic (rock unit, stratigraphic level, lithology) and geographic site data (location, elevation) recorded as a part of the program.

    2. The paleontologist will develop a mitigation plan and a discovery clause/treatment plan to be implemented during earth-moving activities at the project site. The clause/plan will allow for the recovery and subsequent treatment of any fossil remains uncovered by these activities, and for the archiving of associated specimen and site data.

    3. The paleontologist and a paleontological resources construction monitor will attend a pre-construction meeting to explain the mitigation program to contractor staff and to develop procedures and lines of communication to be implemented if fossil remains are uncovered by earth-moving activities, particularly when a monitor is not on site.

4. Monitoring of earth-moving activities (including grading, auguring, trenching, etc.) will be conducted by the paleontological resources monitor on a full-time basis once these activities have reached previously undisturbed sedimentary strata underlying any artificial fill and a depth 5 feet below current grade. Monitoring will consist of inspecting strata freshly exposed by these activities and the debris piles generated by these activities. Monitoring will be conducted to allow for the recovery of larger fossil remains.

5. If fossil remains are found by the monitor, any earth-moving activity will be diverted temporarily around the fossil site until the remains have been removed and the activity has been allowed to proceed through the site by the monitor.

6. If fossil remains are encountered by any earth-moving activity when the monitor is not on site, the activity will be diverted around the fossil site and the monitor called to the site immediately to remove the remains.

7. Sediment samples not to exceed a total weight of 6,000 pounds will be recovered by the monitor or a field technician and fully processed to allow for the recovery of smaller vertebrate fossil remains.

8. Any recovered fossil remains will be prepared to the point of identification and identified to the lowest taxonomic level possible by knowledgeable paleontologists. The remains then will be curated (assigned and labeled with LACMVP specimen and corresponding site numbers, as appropriate; placed in specimen trays and, if necessary, vials with completed specimen data cards) and catalogued, and associated specimen data and corresponding geologic and geographic site data will be archived (specimen and site numbers and corresponding data entered into appropriate LACMVP computerized data bases) at the LACMVP by a laboratory technician. The remains then will be accessioned into the LACMVP fossil collection, where they will be permanently stored, maintained, and made available for future study by qualified investigators.

9. If appropriate, a microfossil sample containing pollen or other microfossils will be submitted for paleoenvironmental analysis.

10. A final report of findings with an inventory of recovered fossil specimens will be prepared by the paleontologist for submission to the MTA and the LACMVP following accessioning of the specimens into the LACMP fossil collection.

Direct Effect on Archaeological Resources. As with the paleontological resources described above, excavation for the Wilshire BRT alternative may result in alteration, removal, and destruction of archaeological resources beneath Wilshire Boulevard. It is possible that archaeological remains associated with unidentified sites may be located within the project area and could be subject to direct effect. This would result in a significant, mitigable impact: implementation of Mitigation Measure 3.17-2 would reduce this impact to a less than significant level.

- *Mitigation Measure 3.17-2 Monitoring and Scientific Recovery of Archaeological Resources:* In the event that archaeological and buried historic sites are encountered, evaluation of the site is often accomplished through test level excavation designed to determine the horizontal and vertical extent of the site, and to characterize the content of the site. If the site is determined to be potentially eligible for listing on the National Register, and project plans cannot be altered to avoid impacting the site, then an adverse effect would result pursuant to 36 CFR 800.5(d)(2). To resolve an adverse effect it would be necessary to implement a Memorandum of Agreement (MOA) per 36 CFR 800.6(c) to resolve the adverse effect. Under CEQA, impacts to archaeological sites can be mitigated to a less than significant level through the preparation and implementation of a data recovery plan.

Direct and Indirect Effects on Historical Resources. The Wilshire BRT alternative would be expected to have a less than significant impact on historical resources, since it would operate in existing ROWs and would not involve substantial new construction that could affect historic property settings.

Alternative 1A: Wilshire BRT (Median Adjacent Design Option)

Implementation of this option would result in cultural resources impacts that are identical to those anticipated to result from Alternative 1.

Alternative 1B: Wilshire BRT (Curb Adjacent Design Option)

Direct Effects on Paleontological Resources. Implementation of this option would result in paleontological resource impacts that are identical to those anticipated to result from Alternative 1.

Direct Effects on Archaeological Resources. Implementation of this option would result in paleontological resource impacts that are identical to those anticipated to result from Alternative 1.

Direct Effects on Historical Resources. The Wilshire BRT Alternative (Curb Adjacent Design Option) will result in the widening of Wilshire Boulevard at the locations shown in Figure 2-9. This widening could require the removal or relocation of potentially historic electroliers and other fixtures, such as streetlights, along Wilshire Boulevard. This would result in a significant, mitigable impact. Under Section 106 of the National Historic Preservation Act, significant impacts to an historic resource can be resolved, or reduced to a less than significant level under CEQA, through redesign of the proposed project to avoid demolition/destruction of the historic resource, or by execution of an MOA with SHPO and other interested parties. Therefore, Mitigation Measures 3.17-3 and 3.17-4 would reduce the impact of the Wilshire BRT/Exposition LRT Alternative on the Pacific Electric Railway to a less than significant level.

- *Mitigation Measure 3.17-3 Historic American Engineering Record Documentation:* Historic American Engineering Record (HAER) documentation shall be prepared for representative historical electroliers, streetlights, and other fixtures. This report shall document the significance of the resource and its physical conditions, both historic and current, through site plans, historic maps, photographs, written data, and text. A report documenting the design and historic significance of the fixtures, including their contextual history, shall be prepared as part of the HAER documentation required by this measure.

- *Mitigation Measure 3.17-4 Memorandum of Agreement.* The impact created by the demolition of a significant historic resource is an adverse effect, which can be resolved by an MOA between the MTA and SHPO, as well as other interested parties, as described above. The actual measures agreed upon in the MOA may vary in substance and degree, but the MOA shall include a process to resolve any adverse effects upon resources discovered during the implementation (36 CFR 800.13(a)). The MOA shall include a provision for monitoring and a mechanism for reporting its implementation (36 CFR 800.6(c)(4)).

Other elements of the MOA shall provide that:

1. Areas subject to physical disturbance by the undertaking are subjected to intensive archaeological study in accordance with a study plan developed in consultation with the SHPO, and submitted in draft to the SHPO for at least 30 days of review and comment.

2. If the study indicates the existence of archaeological resources, the MTA will review the potential significance of such resources with the SHPO to determine whether they are significant. MTA may elect to design the project to preserve resources in place, or to conduct archaeological data recovery to recover significant data from such resources.

Prior to the initiation of each construction contract, a pre-construction meeting should be held with all resident engineers, inspectors, contractor representatives and foremen to review the procedures to be followed regarding the presence of archaeological and/or paleontological monitors, collecting of artifacts, reporting discoveries, and communications.

As far as management or treatment plans can be formulated at this stage, at the very least, monitoring should be provided full time at each location subject to ground disturbance, from the time when any demolition approaches the present surface to below that horizon which may reasonably be expected to yield cultural remains.

When any potentially significant archaeological evidence is observed, work will be halted in that immediate vicinity, and the procedures set forth in the MOA and a Treatment Plan will be followed. Briefly, these procedures shall stipulate that the resource be recorded, identified, and assessed for its significance. If the remains are deemed to be significant, specific recommendations for the mitigation of impacts will be developed and implemented on a case-by-case basis.

Alternative 2: Wilshire BRT and Exposition BRT (Full Length)

The following impact discussion addresses impacts anticipated to result from implementation of the Exposition BRT component of this alternative. The Wilshire BRT component of this alternative would result in impacts identical to those identified for Alternatives 1, 1A, or 1B, depending upon the specific implementation of Wilshire BRT.

Direct Effect on Paleontological Resources. Grade preparations for the Exposition BRT alternative would involve excavation into native soil that could reach depths of 18 to 24 inches below the ground surface. Additionally, excavations for caissons for aerial structure supports could reach depths of several feet in native soils. Such excavation may result in alteration, removal, and destruction of paleontological resources that could be present in the Quaternary alluvium (Qa) that underlies the Exposition ROW. This would represent a significant, mitigable impact: implementation of Mitigation Measure 3.17-5 would reduce this impact to a less than significant level.

- *Mitigation Measure 3.17-5 Monitoring and Scientific Recovery of Paleontological Resources:* Prior to any earth moving at the project site, a qualified vertebrate paleontologist approved by the Los Angeles County Museum of Natural History – Vertebrate Paleontology Section (LACMVP) will be retained by the MTA or its designated contractor to supervise the mitigation program, which shall consist of the following:

    1. The paleontologist will develop a storage agreement with the LACMVP to allow for the permanent storage and maintenance of any fossil remains recovered at the project site as a result of the mitigation program, and for the archiving of associated specimen data (taxon, element) and corresponding geologic (rock unit, stratigraphic level, lithology) and geographic site data (location, elevation) recorded as a part of the program.

    2. The paleontologist will develop a mitigation plan and a discovery clause/treatment plan to be implemented during earth-moving activities at the project site. The clause/plan will allow for the recovery and subsequent treatment of any fossil remains uncovered by these activities, and for the archiving of associated specimen and site data.

    3. The paleontologist and a paleontological resources construction monitor will attend a pre-construction meeting to explain the mitigation program to contractor staff and to develop procedures and lines of communication to be implemented if fossil remains are uncovered by earth-moving activities, particularly when a monitor is not on site.

    4. Monitoring of earth-moving activities (including grading, auguring, trenching, etc.) will be conducted by the paleontological resources monitor on a full-time basis once these activities have reached previously undisturbed sedimentary strata underlying any artificial fill and a depth 5 feet below current grade. Monitoring will consist of inspecting strata freshly exposed by these activities and the debris piles generated by these activities. Monitoring will be conducted to allow for the recovery of larger fossil remains.

    5. If fossil remains are found by the monitor, any earth-moving activity will be diverted temporarily around the fossil site until the remains have been removed and the activity has been allowed to proceed through the site by the monitor.

    6. If fossil remains are encountered by any earth-moving activity when the monitor is not on site, the activity will be diverted around the fossil site and the monitor called to the site immediately to remove the remains.

    7. Sediment samples not to exceed a total weight of 6,000 pounds will be recovered by the monitor or a field technician and fully processed to allow for the recovery of smaller vertebrate fossil remains.

    8. Any recovered fossil remains will be prepared to the point of identification and identified to the lowest taxonomic level possible by knowledgeable paleontologists. The remains then will be curated (assigned and labeled with LACMVP specimen and corresponding site numbers, as appropriate; placed in specimen trays and, if

necessary, vials with completed specimen data cards) and catalogued, and associated specimen data and corresponding geologic and geographic site data will be archived (specimen and site numbers and corresponding data entered into appropriate LACMVP computerized data bases) at the LACMVP by a laboratory technician. The remains then will be accessioned into the LACMVP fossil collection, where they will be permanently stored, maintained, and made available for future study by qualified investigators.

9. If appropriate, a microfossil sample containing pollen or other microfossils will be submitted for paleoenvironmental analysis.

10. A final report of findings with an inventory of recovered fossil specimens will be prepared by the paleontologist for submission to the MTA and the LACMVP following accessioning of the specimens into the LACMP fossil collection.

Direct Effect on Archaeological Resources. As with the paleontological resources described above, excavation for the Exposition BRT alternative may result in alteration, removal, and destruction of archaeological resources beneath the Exposition ROW, including CA-LAN-74, and possibly two other archaeological sites within 200 to 300 feet of the project area (CA-LAN-69 and CA-LAN-70). Additionally, archaeological remains associated with unidentified sites may be located within the project area and could be subject to direct effect. This would result in a significant, mitigable impact: implementation of Mitigation Measure 3.17-6 would reduce this impact to a less than significant level.

- *Mitigation Measure 3.17-6 Monitoring and Scientific Recovery of Archaeological Resources:* In the event that archaeological and buried historic sites are encountered, evaluation of the site is often accomplished through test level excavation designed to determine the horizontal and vertical extent of the site, and to characterize the content of the site. If the site is determined to be potentially eligible for listing on the National Register, and project plans cannot be altered to avoid impacting the site, then an adverse effect would result pursuant to 36 CFR 800.5(d)(2). To resolve an adverse effect it would be necessary to implement a Memorandum of Agreement (MOA) per 36 CFR 800.6(c) to resolve the adverse effect. Under CEQA, impacts to archaeological sites can be mitigated to a less than significant level through the preparation and implementation of a data recovery plan.

Direct Effects on Historical Resources. The Exposition BRT alternative will result in the removal and demolition of the Southern Pacific Railroad/Pacific Electric Railway, which the State Historic Preservation Officer has determined to be eligible to the National Register of Historic Places under Criterion A as defined in 36 CFR 60.4. This would result in a significant impact. Under Section 106 of the National Historic Preservation Act, significant impacts to an historic resource can be resolved, or mitigated to a less than significant level under CEQA, through redesign of the proposed project, or through execution of an MOA with SHPO and other interested parties. Therefore, Mitigation Measures 3.17-7 and 3.17-8 would reduce the impact of the Wilshire BRT/Exposition LRT Alternative on the Pacific Electric Railway to a less than significant level.

- *Mitigation Measure 3.17-7 Historic American Engineering Record Documentation:* Historic American Engineering Record (HAER) documentation shall be prepared for the Pacific Electric Railway. This report shall document the significance of the resource and its physical conditions, both historic and current, through site plans, historic maps, photographs, written data, and text. A report documenting the design and historic significance of the Pacific Electric Railway, including contextual history of the Pacific Electric and its significant role in American history, as well as its history in southern California, shall be prepared as part of the HAER documentation required above.

- *Mitigation Measure 3.17-8 Memorandum of Agreement.* The impact created by the demolition of a significant structure is an adverse effect, which can be resolved by an MOA between the MTA and SHPO, as well as other interested parties, as described above. The actual measures agreed upon in the MOA may vary in substance and degree, but the MOA shall include a process to resolve any adverse effects upon resources discovered during the implementation (36 CFR 800.13(a)). The MOA shall include a provision for monitoring and a mechanism for reporting its implementation (36 CFR 800.6(c)(4)).

  Other elements of the MOA shall provide that:

  3. Areas subject to physical disturbance by the undertaking are subjected to intensive archaeological study in accordance with a study plan developed in consultation with the SHPO, and submitted in draft to the SHPO for at least 30 days of review and comment.

  4. If the study indicates the existence of archaeological resources, the MTA will review the potential significance of such resources with the SHPO to determine whether they are significant. MTA may elect to design the project to preserve resources in place, or to conduct archaeological data recovery to recover significant data from such resources.

  Prior to the initiation of each construction contract, a pre-construction meeting should be held with all resident engineers, inspectors, contractor representatives and foremen to review the procedures to be followed regarding the presence of archaeological and/or paleontological monitors, collecting of artifacts, reporting discoveries, and communications.

  As far as management or treatment plans can be formulated at this stage, at the very least, monitoring should be provided full time at each location subject to ground disturbance, from the time when any demolition approaches the present surface to below that horizon which may reasonably be expected to yield cultural remains.

  When any potentially significant archaeological evidence is observed, work will be halted in that immediate vicinity, and the procedures set forth in the MOA and a Treatment Plan will be followed. Briefly, these procedures shall stipulate that the resource be recorded, identified, and assessed for its significance. If the remains are deemed to be significant, specific recommendations for the mitigation of impacts will be developed and implemented on a case-by-case basis.

Indirect Effect on Historic Resources. The segment of the Exposition BRT alternative that is aligned along USC and Exposition Park will have a less than significant impact on the historical visual setting of historical resources in this segment, including the Southern Pacific Railroad/Pacific Electric Railway. The corridor alignment has already been altered, tracks have been removed, areas have been covered in landscaping, and has therefore been altered to a degree that the proposed stations would not represent a substantial visual intrusion upon the historical setting.

Alternative 2A: Wilshire BRT and Exposition BRT (MOS)

Implementation of this alternative would result in cultural resources impacts identical in significance to those anticipated to result from implementation of Alternative 2.

Alternative 3: Wilshire BRT and Exposition LRT

The following impact discussion addresses impacts anticipated to result from implementation of the Exposition LRT component of this alternative. The Wilshire BRT component of this alternative would result in impacts identical to those identified for Alternatives 1, 1A, or 1B, depending upon the specific implementation of Wilshire BRT.

Direct Effect on Paleontological Resources. Excavation for construction of caissons for aerial structure supports for the LRT alternative may result in alteration, removal, and destruction of paleontological resources that could be present in the soils that underlie the Exposition ROW. This would represent a significant, mitigable impact: implementation of Mitigation Measure 3.17-9 would reduce this impact to a less than significant level.

- *Mitigation Measure 3.17-9 Monitoring and Scientific Recovery of Paleontological Resources:* Prior to any earth moving at the project site, a qualified vertebrate paleontologist approved by the Los Angeles County Museum of Natural History – Vertebrate Paleontology Section (LACMVP) will be retained by the MTA or its designated contractor to supervise the mitigation program, which shall consist of the following:

    1. The paleontologist will develop a storage agreement with the LACMVP to allow for the permanent storage and maintenance of any fossil remains recovered at the project site as a result of the mitigation program, and for the archiving of associated specimen data (taxon, element) and corresponding geologic (rock unit, stratigraphic level, lithology) and geographic site data (location, elevation) recorded as a part of the program.

    2. The paleontologist will develop a mitigation plan and a discovery clause/treatment plan to be implemented during earth-moving activities at the project site. The clause/plan will allow for the recovery and subsequent treatment of any fossil remains uncovered by these activities, and for the archiving of associated specimen and site data.

    3. The paleontologist and a paleontological resources construction monitor will attend a pre-construction meeting to explain the mitigation program to contractor staff and to develop procedures and lines of communication to be implemented if fossil remains are uncovered by earth-moving activities, particularly when a monitor is not on site.

    4. Monitoring of earth-moving activities (including grading, auguring, trenching, etc.) will be conducted by the paleontological resources monitor on a full-time basis once these activities have reached previously undisturbed sedimentary strata underlying

any artificial fill and a depth 5 feet below current grade. Monitoring will consist of inspecting strata freshly exposed by these activities and the debris piles generated by these activities. Monitoring will be conducted to allow for the recovery of larger fossil remains.

5. If fossil remains are found by the monitor, any earth-moving activity will be diverted temporarily around the fossil site until the remains have been removed and the activity has been allowed to proceed through the site by the monitor.

6. If fossil remains are encountered by any earth-moving activity when the monitor is not on site, the activity will be diverted around the fossil site and the monitor called to the site immediately to remove the remains.

7. Sediment samples not to exceed a total weight of 6,000 pounds will be recovered by the monitor or a field technician and fully processed to allow for the recovery of smaller vertebrate fossil remains.

8. Any recovered fossil remains will be prepared to the point of identification and identified to the lowest taxonomic level possible by knowledgeable paleontologists. The remains then will be curated (assigned and labeled with LACMVP specimen and corresponding site numbers, as appropriate; placed in specimen trays and, if necessary, vials with completed specimen data cards) and catalogued, and associated specimen data and corresponding geologic and geographic site data will be archived (specimen and site numbers and corresponding data entered into appropriate LACMVP computerized data bases) at the LACMVP by a laboratory technician. The remains then will be accessioned into the LACMVP fossil collection, where they will be permanently stored, maintained, and made available for future study by qualified investigators.

9. If appropriate, a microfossil sample containing pollen or other microfossils will be submitted for paleoenvironmental analysis.

10. A final report of findings with an inventory of recovered fossil specimens will be prepared by the paleontologist for submission to the MTA and the LACMVP following accessioning of the specimens into the LACMP fossil collection.

Direct Effect on Archaeological Resources. Excavation for construction of caissons for aerial structure supports for the LRT alternative may result in alteration, removal, and destruction of CA-LAN-74, an archaeological site. There are two other archaeological sites that lie 200 to 300 feet from the corridor (CA-LAN-69 and CA-LAN-70), but these have not been identified by subsequent investigations. However, it is possible that archaeological remains associated with these sites may extend into the project area and be subject to direct effect. This would result in a significant, mitigable impact: implementation of Mitigation Measure 3.17-10 would reduce this impact to a less than significant level.

- *Mitigation Measure 3.17-10 Monitoring and Scientific Recovery of Archaeological Resources:* In the event that archaeological and buried historic sites are encountered, evaluation of the site is often accomplished through test level excavation designed to determine the horizontal and vertical extent of the site, and to characterize the content of the site. If the site is determined to be potentially eligible for listing on the National Register, and project plans cannot be altered to avoid impacting the site, then an adverse effect would result pursuant to 36 CFR 800.5(d)(2). To resolve an adverse effect it would be necessary to implement a Memorandum of Agreement per 36 CFR 800.6(c) to resolve the adverse effect. Under CEQA, impacts to archaeological sites can be mitigated to a less than significant level through the preparation and implementation of a data recovery plan.

Direct Effects on Historic Resources. The Exposition LRT alternative will result in the removal and demolition of the Southern Pacific Railroad/Pacific Electric Railway, which the State Historic Preservation Officer has determined to be eligible to the National Register of Historic Places under Criterion A as defined in 36 CFR 60.4. This would result in a significant impact. Under Section 106 of the National Historic Preservation Act, significant impacts to an historic resource can be reduced to a level of insignificance through redesign of the proposed project to avoid demolition/destruction of the historic resource, or through execution of an MOA. Therefore, Mitigation Measures 3.17-7 (preparation of HAER documentation) and 3.17-8 (an MOA), would reduce the impact of the Wilshire BRT/Exposition LRT Alternative on the Pacific Electric Railway to a less than significant level.

Indirect Effect on Historic Resources. The LRT alternative would have an indirect effect on historic resources because it would alter the visual setting of the USC/Exposition Park historic resources, including the Hancock Memorial Museum, USC Widney Hall, USC Faculty Center, USC Town and Gown Center, Ormerod Harris Hall, the State Armory Building, Natural History Museum, Los Angeles Memorial Coliseum, and the Exposition Park Rose Garden.

There are numerous historic structures in addition to those mentioned above, but in each case the historical setting has already been significantly altered and as a result there will be no effect to these additional properties. The effect of this alternative on the USC/Exposition Park historic resources will be the construction of a modern catenary system, which will alter the historic setting of the above resources. This would represent a significant, mitigable impact: Implementation of Mitigation Measure 3.17-11, an alternative design of the overhead catenary system, would reduce this impact to a less than significant level.

- *Mitigation Measure 3.17-11 Alternative Design of Overhead Catenary System:* The placement of the catenary system on the along Exposition Boulevard in the vicinity of Exposition Park and USC would not result in a visual impact if the catenary supports were designed to mimic the historic ones that were part of the Pacific Electric Line. This measure would reduce the visual impacts on the structures to a less than significant degree.

Alternative 3A: Wilshire BRT and Exposition LRT (MOS)

Implementation of this alternative would result in cultural resources impacts identical in significance to those anticipated to result from implementation of Alternative 3.

Maintenance Yard

The following impacts would potentially apply to all of the proposed maintenance yard sites:

Direct Effects on Paleontological Resources. Maintenance yards, irrespective of whether they would be used to service BRT or LRT vehicles, would require excavation for underground fuel storage tanks, building foundations, utilities, and other structures. This ground disturbance has the potential to damage or destroy paleontological resources. This would be a significant, mitigable impact. Implementation of Mitigation Measure 3.17-9 would reduce this potential impact to a less than significant level.

Direct Effects on Archaeological Resources. Maintenance yards, irrespective of whether they would be used to service BRT or LRT vehicles, would require excavation for underground fuel storage tanks, building foundations, utilities, and other structures. This ground disturbance has the potential to damage or destroy intact archaeological resources. This would be a significant, mitigable impact. Implementation of Mitigation Measure 3.17-10 would reduce this potential impact to a less than significant level.

The following discussion focuses upon the site-specific potential for cultural resources impacts.

- Northwest corner of Cesar Chavez Boulevard and Mission Avenue

Direct Effects on Historical Resources. The site does not contain historical or potentially historical structures. Therefore, the construction of maintenance yards would result in no impact from direct effects on historical resources.

Indirect Effects on Historical Resources. This proposed site is adjacent to a historic bridge, and may have the potential to alter the historical setting of this bridge. Because a maintenance facility represents an intrusion into a setting that did not include structures, no mitigation for this intrusion through design of the structures or facilities could reduce this impact, which would be significant and unavoidable.

- Alameda Street and 7th Street (expansion of existing facility)

Direct Effects on Historical Resources. The site does not contain historical or potentially historical structures. Therefore, the construction of maintenance yards would result in no impact from direct effects on historical resources.

Indirect Effects on Historical Resources. This proposed site is adjacent to the SRO Hotel, a historic brick structure. However, the proposed site is currently vacant, and is adjacent to an existing MTA bus maintenance facility. Because the site was previously developed and represents an expansion of an existing facility, the historical context of this structure has already been substantially altered, and the intrusion of the facility would be considered less than significant.

- Northeast corner of Alameda Street and Washington Street

Direct Effects on Historical Resources. The site does not contain historical or potentially historical structures. Therefore, the construction of maintenance yards would result in no impact from direct effects on historical resources.

Indirect Effects on Historical Resources. No historical structures with intact settings lie adjacent to this proposed site. Therefore, the construction of the proposed maintenance yard site would have no impact resulting from indirect effects on historical resources.

- Southeast corner of Alameda Street and Washington Street

Direct Effects on Historical Resources. The site does not contain historical or potentially historical structures. Therefore, the construction of maintenance yards would result in no impact from direct effects on historical resources.

Indirect Effects on Historical Resources. Historical or potentially historical structures with potentially intact settings lie in the vicinity of this proposed site, and the construction of a maintenance facility on this site could represent an intrusion that may adversely affect this historical setting, which would be a significant, mitigable impact. The maintenance facility could be designed in such a way as to blend more readily with the surrounding structures, in accordance with the Secretary of the Interior's *Standards for the Treatment of Historic Properties* and *Guidelines for the Treatment of Cultural Landscapes*, thereby reducing the intrusion. Implementation of Mitigation Measure 3.17-12 would reduce this impact to a less than significant level.

- *Mitigation Measure 3.17-12 Alternative Design of Maintenance Facility:* The maintenance facility shall be designed in such a way as to blend architecturally with the surrounding structures, in accordance with the Secretary of the Interior's *Standards for the Treatment of Historic Properties* and *Guidelines for the Treatment of Cultural Landscapes*, thereby reducing the intrusion. If an alternative design cannot achieve this effect, appropriate methods for screening the maintenance facility, per the aforementioned guidelines, shall be implemented.

- Exposition ROW: Hooper to Central

Direct Effects on Historic Resources. Construction of a maintenance facility at this site will result in the removal and demolition of a portion of the Southern Pacific Railroad/Pacific Electric Railway, which the State Historic Preservation Officer has determined to be eligible to the National Register of Historic Places under Criterion A as defined in 36 CFR 60.4. This would result in a significant impact. Under Section 106 of the National Historic Preservation Act, significant impacts to an historic resource can be reduced to a less than significant level through redesign of the proposed project to avoid demolition/destruction of the historic resource, or through execution of an MOA. Therefore, Mitigation Measures 3.17-7 (HAER documentation) and 3.17-8 (an MOA with the MTA, SHPO, and other interested parties) would reduce the impact of this proposed maintenance facility on the Southern Pacific Railroad/Pacific Electric Railway to a less than significant level.

Indirect Effects on Historical Resources. No historical structures with intact settings lie adjacent to this proposed site: the integrity of the setting for proximate historical or potentially historical structures has been severely disrupted. Therefore, the construction of the proposed maintenance yard site would have no impact resulting from indirect effects on historical resources.

- Existing MTA South Park Shops

Direct and Indirect Effects on Historic Resources. Construction of a maintenance facility at this site will result in the removal and demolition of a portion of the Southern Pacific Railroad/Pacific Electric Railway, which the State Historic Preservation Officer has determined to be eligible to the National Register of Historic Places under Criterion A as defined in 36 CFR 60.4. This would result in a significant impact. Under Section 106 of the National Historic Preservation Act, significant impacts to an historic resource can only be reduced to a level of insignificance through redesign of the proposed project to avoid demolition/destruction of the historic resource. Therefore, although Mitigation Measures 3.17-7 (HAER documentation) and 3.17-8 (and MOA with the MTA, SHPO, and other interested parties) would reduce the impact of this proposed maintenance facility on the Southern Pacific Railroad/Pacific Electric Railway to a less than significant level.

Subway Design Option at USC/Exposition Park (Alternatives 2, 2A, 3, and 3A)

Direct Effects on Paleontological Resources: Implementation of the subway design option would result in substantially greater ground disturbance than either the Exposition BRT or Exposition LRT alternative by themselves. Any significant disturbance of the ground surface has the potential to impact paleontological resources, whether this disturbance results from permanent change, such as excavation for a station or tunnel entrance, or only temporary use for parking, storage or lay-down yards. This potential for disturbance would be increased by the implementation of this mitigation measure, and would result in a significant, mitigable impact: Implementation of Mitigation Measure 3.17-9 would reduce this potential impact to a less than significant level.

Direct Effects on Archaeological Resources: Implementation of the subway design option could result in substantially greater ground disturbance than either the Exposition BRT or LRT alternative by themselves. As with the alternative, any disturbance of the ground surface has the potential to adversely affect archaeological resources, and this potential for disturbance would be increased by the implementation of this mitigation measure, and could result in a significant, mitigable impact: Implementation of Mitigation Measure 3.17-10 would reduce this potential impact to a less than significant level.

3.17.4 Cumulative Impacts

The 1998 RTP Draft Master EIR (SCAG, 1997), which is hereby incorporated by reference, provides the cumulative context for analysis of the Mid-City/Westside Transit Corridor Project. Part 2, Chapter 9 of the 1998 RTP Draft Master EIR provides a programmatic analysis of impacts to paleontological, archaeological, and historical resulting from implementation of all projects contemplated in the RTP (SCAG, 1998), including the Mid-City/Westside Transit Corridor project, and provides the basis for this cumulative impact analysis.

Direct cumulative impacts to cultural resources generally result from destruction or substantial modification of resources or their contexts, such that the significance of the resources is materially diminished. Indirect cumulative impacts generally result from the destruction or modification of the context of a resource. Projects contemplated in the RTP that would not result in substantial ground-disturbance or excavation (e.g., improvements to existing surface transit systems, or construction of new surface transit systems) are unlikely cause direct cumulative impacts to paleontological or archaeological resources. Such projects may also not require demolition of historic structures, and are unlikely to cause significant direct cumulative impacts to historical resources.

However, some of the transit corridor projects shown in Table 3 of the 1998 RTP could be implemented within existing rights-of-way that include historical structures, including the rail lines themselves, as with the Exposition right-of-way. As with two of the alternatives analyzed here, these projects may involve removal of these historic rail lines and attendant structures, in order to implement the specialized infrastructure required for transit modes such as HRT, LRT, and BRT (the RTP does not always specify a transit mode: local operators are left to select how the transit goals are met).

Also, as with portions of the Exposition right-of-way, projects may traverse historical or potentially historical neighborhoods or districts, and structures necessitated by some transit modes, such as stations, platforms, or catenary systems, may disrupt the historic context of these districts. This would represent significant cumulative indirect impacts that may or may not be mitigable, depending upon the nature of the district and the proposed structures.

No Action Alternative (Baseline)

The No Action Alternative, as stated above, is anticipated to have no impact on cultural resources. Therefore, it would not contribute to a cumulative impact on any of these resources, and no cumulative impact would occur.

Transportation System Management (TSM) Alternative

The TSM Alternative, as stated above, is anticipated to have no impact on cultural resources, since no physical changes to any cultural resources would occur. Therefore, this alternative would not contribute to a cumulative impact on any of these resources, and no cumulative impact would occur.

Alternative 1: Wilshire BRT (Baseline Median-Running)

As stated above, implementation of the Wilshire BRT Alternative would not result in any substantial excavation, and would therefore not result in any impacts to paleontological or archaeological resources. Therefore, this alternative would not contribute to cumulative effects on these resources. Additionally, the indirect impact of this alternative on historic contexts is less than significant, since the context of the historic portions of the Wilshire route have already been substantially disrupted, and their contextual value compromised. Therefore, this alternative would have a less than significant cumulative impact on cultural resources.

Alternative 1A: Wilshire BRT (Median Adjacent Design Option)

Cumulative impacts to cultural resources associated with this alternative would be identical to the cumulative impacts identified for Alternative 1.

Alternative 1B: Wilshire BRT (Curb Adjacent Design Option)

Cumulative impacts to cultural resources associated with this alternative would be identical to the cumulative impacts identified for Alternative 1.

Alternative 2: Wilshire BRT and Exposition BRT (Full Length)

Secondary impacts to paleontological and archaeological could result from the subway mitigation measures proposed for this alternative; however, implementation of Mitigation Measures 3.17-9 and 3.17-10 would reduce these impacts to a less than significant level, and the cumulative impact to these resources would also be less than significant.

However, as stated above, implementation of the Exposition BRT portion of this alternative would result in the removal of portions of the historic Pacific Electric Railway (an NRHP-eligible resource), which would result in a significant impact. Because this resource has been determined by SHPO to be significant to the Southern California region, this impact would be considered cumulatively considerable, and would be a significant cumulative impact.

Alternative 2A: Wilshire BRT and Exposition BRT (MOS)

Cumulative impacts to cultural resources that would result from implementation of this alternative are identical in significance to those identified for Alternative 2.

Alternative 3: Wilshire BRT and Exposition LRT (Full Length)

Secondary impacts to paleontological and archaeological could result from the subway design option proposed for this alternative; however, implementation of Mitigation Measures 3.17-9 and 3.17-10 would reduce these impacts to a less than significant level, and the cumulative impact to these resources would also be less than significant.

Installation of the catenary system required for operation of the LRT would result in a potentially significant, indirect impact to the historic context of the USC/Exposition Park historic district; however, implementation of Mitigation Measure 3.17-11 would reduce this to a less than significant level, and because this impact occurs in a limited area, the cumulative impact resulting from this impact would also be less than significant.

However, as stated above, implementation of the Exposition LRT portion of this alternative would result in the removal of portions of the historic Pacific Electric Railway (an NRHP-eligible resource), which would result in a significant impact. Because this resource has been determined by SHPO to be significant to the Southern California region, this impact would be considered cumulatively considerable, and would be a significant cumulative impact.

Alternative 3A: Wilshire BRT and Exposition LRT (MOS)

Cumulative impacts to cultural resources that would result from implementation of this alternative are identical in significance to those identified for Alternative 3.

Subway Design Option at US/Exposition Park

Direct Effects on Paleontological Resources From Proposed Subway Design Option: Implementation of the subway design option could result in substantially greater ground disturbance than Alternatives 2, 2A, 3, and 3A. As with these alternatives, any disturbance of the ground surface has the potential to impact paleontological resources, whether this results from permanent change such as excavation for a station or tunnel entrance, or only temporary use for parking, storage or lay-down yards. However, the potential for disturbance would be substantially increased by the implementation of this option, and would result in a significant, mitigable impact: Implementation of Mitigation Measure 3.17-9 would reduce this potential impact to a less than significant level.

Direct Effects on Archaeological Resources From Proposed Subway Design Option: Implementation of this design option would result in substantially greater ground disturbance than Alternatives 2, 2A, 3, and 3A. Any disturbance of the ground surface has the potential to adversely affect archaeological resources. However, the potential for disturbance would be substantially increased by the implementation of this option, and could result in a significant, mitigable impact: Implementation of Mitigation Measure 3.17-10 would reduce this potential impact to a less than significant level.

3.18 Construction Impacts

3.18.1 Construction Methods

The development on the Mid-City/Westside Transit Corridor will employ conventional construction methods, techniques, and equipment. All work for development of a transit system will conform to accepted industry specifications and standards. Major elements of the project include the construction of roadways for the Wilshire Boulevard and Exposition BRT routes, guideway and trackwork for the Exposition LRT, at-grade station platforms, aerial grade separations and possible subway segments. The BRT and LRT alternatives would both require the installation of additional infrastructure for elements such as communications and signaling. In addition, the LRT would require the installation of a traction power system.

The types of equipment that would be used in construction of the BRT and LRT alternatives include: graders, bull-dozers, cranes, cement mixers, flat bed trucks, dump trucks to haul dirt and spoil materials, and possible tunnel boring machines and rail mounted muck cars. These construction vehicles would be used along the Wilshire Boulevard (not including those types of equipment related to subway or aerial construction) and Exposition corridors, and would possibly impede traffic mobility in areas of construction. In order to minimize any disruptions to traffic, mitigation of potential traffic impacts, and traffic management and traffic control measures will be implemented with the coordination and involvement of the cities along the project route. Mitigation measures may involve partial- or full-street closures, sidewalk closures, and detours.

The work activities for each of the three alternatives would include the following facility and system items:

Wilshire BRT

- Relocation of existing utilities at stations;
- Relocation of existing utilities that conflict with in-street or MTA right-of-way (ROW) guideway construction;
- Construction of at-grade BRT station platforms at street locations using typical "cast-in-place" construction methods;
- Construction of surface drainage and sub-drainage systems;
- Construction of replacement parking facilities at various locations along the alignment..
- Placement of 12" thick Portland Cement Concrete exclusive busway over 16" Crushed Aggregate Base over compacted sub-grade.
- Construction of station finishes, such as canopies, fare vending equipment, station furniture, ramps, elevators, escalators, landscaping, and all other amenities necessary for a functional station;

- Where daytime construction is possible, the contractor could close up to three travel lanes at one time. One travel lane in one direction would be used for equipment staging while two lanes in the opposite could be devoted for actual station or lane construction. The window for this construction would be limited to off-peak hours only along with temporary curb parking restrictions (Tow-away No Parking Anytime). A traffic management plan to identify construction staging, detour routes and mitigation measures to the adjacent neighborhood would be developed and approved by the community and local jurisdictions during preliminary engineering.

- Where daytime construction is impossible due to heavy existing traffic volumes or opposed by the community, the contractor would to be restricted to nighttime operation. Temporary closures of entire roadways or up to four travel lanes may be required. Also, a traffic management plan to identify construction staging, detour routes and mitigation measures to the adjacent neighborhood would be developed and approved by the community and local jurisdictions during preliminary engineering.

- Conducting subsystem and system testing;

- Conducting simulated revenue operation test runs and final commissioning of the system.

- Most of the physical construction of the busway on Wilshire could be accomplished in a 2-year to 2-year 8-month time frame

Exposition BRT

- Construction of aerial guideway and aerial stations which will include foundations, support columns, girders, and deck slabs. This construction will be either "cast in place," partially precast, steel or a combination of these depending on the final design and the preferred approach of the construction contractor;

- Construction of retaining walls for approaches to aerial guideway or shallow trenches;

- Relocation of existing utilities at stations;

- Relocation of existing utilities that conflict with in-street or MTA right-of-way (ROW) guideway construction;

- Construction of at-grade BRT station platforms at MTA ROW or street locations using typical "cast-in-place" construction methods;

- Construction of underground duct banks for signaling/communications;

- Construction of surface drainage and sub-drainage systems;

- Construction of parking facilities at the Crenshaw Boulevard, La Brea Avenue, La Cienega Boulevard, Pico/Sawtelle Boulevards, Bundy Drive, and Cloverfield Boulevard stations.

- Placement of 12" thick Portland Cement Concrete exclusive busway over 16" Crushed Aggregate Base over compacted sub-grade.

- Construction of noise walls approximately 12 feet high in sensitive areas along the ROW.
- Construction of station finishes, such as canopies, fare vending equipment, station furniture, ramps, elevators, escalators, landscaping, and all other amenities necessary for a functional station;
- Conducting subsystem and system testing;
- Conducting simulated revenue operation test runs and final commissioning of the system.
- Most of the physical construction of the Exposition BRT could be accomplished in a 3-year to 3-year 6-month time frame.

Expositon LRT

- Construction of aerial guideway and aerial stations which will include foundations, support columns, girders, and deck slabs. This construction will be either "cast in place," partially precast, steel or a combination of these depending on the final design and the preferred approach of the construction contractor;
- Construction of retaining walls for approaches to aerial guideway, portal structures (Optional) and shallow trenches;
- Optional construction of a 0.7-mile subway facility serving both Vermont Avenue bus patrons and USC/Exposition Park;
- Relocation of existing utilities at stations and portals (Optional);
- Relocation of existing utilities that conflict with in-street or MTA right-of-way (ROW) guideway construction;
- Construction of at-grade high-platform stations in MTA ROW or at street locations using typical "cast-in-place" construction methods;
- Construction of underground duct banks for electrical power feeds and for signaling/communications
- Construction of surface drainage and sub-drainage systems;
- Construction of traction power substations with electrical power feeds;
- Construction of an overhead catenary system including pole foundations, overhead wires, support brackets, feeder cables and other components or alternative power distribution support system;
- Construction of parking facilities at the Crenshaw Boulevard, La Brea Avenue, La Cienega Boulevard, Venice/Washington Boulevards, Pico/Sawtelle Boulevards, Bundy Drive, and Cloverfield Boulevard. (Parking at the Ocean Avenue Station will be undertaken by the City of Santa Monica under a separate contract);

- Installation of trackwork, including preparation of track bed and slab, rail, fasteners, and infill concrete for street sections in Hill Street in downtown Los Angeles and in Olympic Boulevard in Santa Monica;
- Construction of open track in ballasted track bed (with optional sodded turf even with top of rail), and with direct fixation fasteners on aerial guideways and subway facility (Optional);
- Construction of noise walls generally 4 feet high (but up to 8 feet high at locations where wall is some distance from the track) in sensitive areas along the ROW.
- Construction of station finishes, such as canopies, fare vending equipment, station furniture, ramps, elevators, escalators, landscaping, and all other amenities necessary for a functional station;
- Conducting subsystem and system testing;
- Conducting simulated revenue operation test runs and final commissioning of the system.
- Most of the physical construction of the Exposition LRT could be accomplished in a 3-year to 3-year 6-month time frame. If the subway option is chosen the construction would take approximately 6 to 12 months longer, or a total construction period of up to four to four and half years.

In order to achieve the construction timeframe described for each of the three alternatives, work would begin simultaneously at several locations along the particular alternative to accommodate areas requiring lengthy construction times. The objective of this approach is to bring the various segments to completion at approximately the same time.

Many contractors specializing in various methods of construction would be working on the project selected for the overall length of the construction period. The physical construction would involve the method that is most suitable for each segment of the project. A typical sequence of construction is shown in Table 3.18-1.

Construction of the project would follow all applicable local, state and federal laws for building and safety. Equipment used on the project would be fitted with mufflers and spark arresters. Standard construction methods would be used for traffic, noise, vibration, and dust control, consistent with all applicable laws.

TABLE 3.18-1
TYPICAL SEQUENCE OF CONSTRUCTION ACTIVITIES

Activity	Tasks	Average Time Required (months)
1. Survey	Locate utilities, establish ROW and project control points and centerlines, and relocate survey monuments.	4 - 6
2. Site Preparation	Relocate utilities and clear and grub ROW (demolition), establish detours and haul routes, erect safety devices and mobilize special construction equipment, prepare construction equipment yards and stockpile materials.	8-18

TABLE 3.18-1 TYPICAL SEQUENCE OF CONSTRUCTION ACTIVITIES		
Activity	**Tasks**	**Average Time Required (months)**
3. Heavy Construction	Construction of concrete roadway (BRT only), aerial structures (BRT and LRT), trackway in streets, on open right-of-way and on aerial structures (LRT only), optional underground station, retaining walls for fill or cut segments, piers and columns and disposal of excess material. Refinish roadways and sidewalks.	24 – 36
4. Medium Construction	Install lighting, signage and striping for concrete roadways, lay track, construct surface stations, drainage, backfill and pave streets.	12 – 18
5. Light Construction	Finish work, install all system elements (electrical, signals, and communication) landscaping, signing and striping close detours, clean up and test system.	6 – 12
6. Open Project		

Haul routes to disposal sites would be predetermined by agreement with local authorities before construction. They would follow streets and highways forming the safest or shortest route with the least adverse effect on traffic, residences, and businesses. Table 3.18-2, Potential Disposal Sites, shows disposal sites for various classifications of excess materials. Potential sources of contaminated soil and ground water are discussed in the Hazardous Materials Technical Report.

TABLE 3.18-2 POTENTIAL DISPOSAL SITES		
Material	**Class of Site**	**Location**
Hazardous Material	Class I	BKK site in West Covina
Unusable Material (Organic Mixed)	Class II	Monterey Park Puente Hills
Asphalt, Concrete	Recycle	Irwindale
Usable Backfill	Class III	Nearby landfill sites or ongoing construction projects

Above-Ground Facilities

<u>Utility Relocation and Street Closures</u>

Prior to beginning construction it would be necessary to relocate, modify, or protect in place all utilities and underground structures which would conflict or interfere with excavations for street level concrete pavement or trackwork, subway facilities, aerial guideways, and station structures. Utilities that would interfere with construction would be relocated or offset away from the proposed facilities. During relocation of utilities it may be necessary to occupy additional traffic lanes at one time, or that block-long sections of streets would be closed temporarily. Pedestrian access (sidewalks) would remain open whenever possible and special facilities such as handrails, fences, and walkways would be provided for safety.

During utility relocation some minor streets and alleyways may be temporarily closed. Major cross streets along the route may require partial closure, half of the street at a time, for utility relocation, station construction, or the construction of roadway foundation or light rail trackbed. Full blocks may have to be closed during excavation, preparation of subgrade, and track foundations placement.

Equipment used for utility relocation work includes diamond saws, pavement breakers, jackhammers, excavators, compressors, dump trucks, and welding machines.

At-Grade Guideway

The Wilshire BRT and the Exposition ROW guideway would consist of twelve-inch thick Portland Cement Concrete pavement over compacted base material. On Wilshire Boulevard, the existing asphalt pavement and base material would be removed, the sub-base graded and compacted, and replaced with a new concrete roadway. The completed lanes would be exclusively for buses, and would be separated from adjacent traffic lanes by a six-inch concrete curb or four-inch Bots Dots. For the Exposition ROW, existing track and portions of interfering roadway would be removed and replaced by an excavated trench and roadway, similar that described for Wilshire Boulevard, or an embedded track, or an open track with ties and ballast.

Clearing and utility relocation would occur first, proceeding well ahead of guideway construction. Typically roadway construction would be constructed in two- or three-block segments for a period of three to four weeks each. For the embedded track the trackbed would be excavated and track slab put in place for supporting the rails. It is estimated that preparation for and construction of the trackbed could be accomplished at the rate of 100-200 feet per day, depending on working hours and whether full or partial street closures are implemented. Local storage areas will be necessary for short-term storage and to facilitate placement of rails or roadway materials. In general, open track sections would not require utility relocation since the alignment closely follows the in-place abandoned track. Equipment used for construction of the tracks or concrete roadway would be similar to what is required for relocation of the utilities with the addition of track-laying equipment, paving machines, concrete mixers and concrete finishers.

Parking Facilities

There would be no park and ride facilities for the Wilshire BRT. Two existing parcels on Wilshire Boulevard (located at Crenshaw Boulevard and La Brea Avenue) would be used to provide replacement parking as a mitigation measure for the large-scale removal of parking along the entire length of Wilshire Boulevard. The Exposition BRT would provide six park and ride lots located at the Crenshaw Boulevard, La Brea Avenue, La Cienega Boulevard, Pico/Sawtelle Boulevards, Bundy Drive, and Cloverfield Boulevard stations for an approximate total of 2,881 spaces. Park and ride lots for the Exposition LRT Alternative would include the same lots for the Exposition BRT, with additional lots at Venice/Washington Boulevards, and at Ocean/Colorado Avenues for an approximate total of 3,493 parking spaces. Except for the Crenshaw Boulevard lot, all parking would be on property owned by either the MTA or the City of Santa Monica. Currently, a significant number of these parcels contain structures, but nearly all leases expire by the year 2011, and the land would presumably be available to begin construction between 2012 and 2015. Any existing structures would be demolished, and debris removed from the area. If hazardous materials were found to be present, the removal and remediation of affected areas would be undertaken.

Construction of the parking lot would involve sub-grade preparation, paving and striping of the parking area; reconstruction of concrete curbs, driveways, and sidewalks as necessary; and planting of appropriate landscaping.

Equipment used for construction of the parking facility would include diamond saws, pavement breakers, jackhammers, compressors, concrete pumping equipment, paving machines, dump trucks, and front-end loaders.

Aerial Guideway/Bridges

Sites for aerial structures required for the Exposition BRT/LRT project would be areas of major construction, and would consist of cast-in-place or pre-cast girders with support columns spaced approximately 80 feet apart, although actual distances may vary. A 1,000-foot segment of aerial guideway could require as much as 18 months to complete. Typical construction methods for the aerial structure would involve several phases of work: foundation construction, installation of columns, and setting in place of concrete girders or steel trusses.

Construction of the column foundations could begin at the same time that the utilities are relocated, providing the utilities do not directly impact the foundation locations. Depending upon the subsurface geology at a particular site, decisions would be made to use either drilled, cast-in-place caissons or driven piles to support the column foundations. The minimum working area required for installation of the caissons would be at least 12 feet, equivalent to one traffic lane width, with an addition of about 24 feet required for ingress and egress during working hours. Much of the aerial guideway consisting of precast or prefabricated members would be located off-street and would not interrupt normal traffic flow. However, on and off ramps and frontage roads for the freeway may experience temporary detours and closures. Where soil conditions are poor (too much groundwater or unstable materials), piles that are impact driven or drilled into place may be necessary. As an alternative, drilled cassions using slurry displacement methods could be used.

Once the foundations are in place, the columns would be constructed. The columns would be built as cast-in-place reinforced concrete. Cast-in-place columns would be erected by using steel reinforcement tied into the foundations and framing wood or steel forms into which the concrete could be placed. When the columns are set, "T" heads would be attached atop each one, and two concrete girders would be placed linking the individual columns. The concrete box girders would be transported to the site by truck and placed by cranes. Similarly, steel truss bridges are pre-fabricated to minimize assembly time at the site. It may be possible to conduct most of the column construction and girder placement during late night hours to minimize disruptions on local streets.

Equipment used for construction of the aerial guideway would include drill rigs/augers, cranes, pile drivers, jackhammers, compressors, concrete pumping equipment, dump trucks, front-end loaders, paving machines, and large tractor-trailer rigs to carry girders and miscellaneous tools.

Retained Fill and Retaining Cut Construction

Retained fill construction would generally be required for approaches to aerial guideways and use of precast retaining wall systems may also be considered. The sidewalls would be constructed in segments beginning at one end of the trench and continuing to the other. Once the walls are completed, backfill would be placed on the retained side and compacted. The imported material for retained fill could come from the existing ROW where the present railroad grade would be considerably lowered at many locations in order to more closely match the ground surfaces of adjacent roadways and private properties, or from an off-site source.

The excavation or embankment work would be accomplished using bulldozers, earthmovers, and front-end loaders, and tractor-trailer rigs. Any unsuitable material would be transported to approved disposal sites. Equipment used for construction of the retaining walls would include shoring, cranes, jackhammers, compressors, concrete pumping equipment, dump trucks, front-end loaders, paving machines, and large tractor-trailer rigs to carry precast elements and miscellaneous tools.

At Grade Stations

All stations could be constructed simultaneously with the various segments of the system. At-grade stations on the Wilshire BRT or on the Exposition BRT/LRT would be constructed approximately one mile apart from each other. These stations would be constructed from standard building materials, such as brick, concrete, steel and heavy plastic, which are durable and resistant to vandalism. The stations for the BRT would be approximately 100 feet long by 11 feet wide and would be constructed as side platforms to allow the use of right-door buses. The LRT stations would be similar to the existing Long Beach Blue Line stations and proposed Pasadena Blue Line stations.

Underground Facilities

Stations and Portals

Underground station construction methods will be similar to those used for the existing Metro Red Line stations, although the overall length of the optional BRT/LRT station will be much shorter than the length of Metro Red Line stations, or about 270 feet. The optional cut and cover subway would be accessed through portals located just east of Figueroa Street and just west of Vermont Avenue. The station as well as the portals and main subway section would be constructed by cut-and-cover and open cut methods. The depth of the subway structure would be approximately 44 feet for the BRT and 41 feet for the LRT, the BRT requiring an additional 3 feet of space above the subway ceiling for exhaust ventilation equipment. A depth of this magnitude is required to avoid several large gravity sanitary sewer and storm drain lines up to 48-inches in diameter. There is also a 61-inch water main (in a 72-inch casing) that would be extremely expensive to relocate. Both the BRT and LRT stations would use side platforms to avoid having the main subway section interfere with manhole shafts of the proposed East Central Interceptor Sewer (ECIS) that will run parallel to the north side of the subway and a 54-inch sanitary sewer along the south side.

A possible optional in tunnel construction would be to utilize the Segmental Excavation Method (ESM) where a potion of the tunnel segment would be bored with a tunneling machine. This method would allow some surface areas to remain intact during construction, particularly at Figueroa Street and Vermont Avenue, which could greatly minimize adverse construction impacts. The cost effectiveness of this approach may, in fact, be on a par with conventional cut and cover methods for a tunnel segment of this length.

Final Design

During final design, the precise design elements of the optional BRT or LRT underground portion would be developed, reflecting, among other information, the final geotechnical investigations, as well as the final location of entrances and shafts at street level. These conditions will influence construction methods selected for tunnels and stations. Final design would, in turn, lead to determinations of contract packaging and construction sequencing. Different contracts could be let to construct different portions of the subway. For example, separate contracts may be let to construct the cut and cover tunnels and finished station work. Utility and demolition work at the various stations could also come under separate contracts. Alternatively, a single contract is also an option. Consistent with industry trends, alternative project delivery methods such as Design/Build would be investigated.

Pre-Construction Activities

Pre-construction activities would include building assessments (pre-construction evaluation of existing structures along the alignment) and traffic sequencing. Public affairs and construction staff from the MTA would contact and interview individual businesses, allowing for knowledge and understanding of how these businesses carry out their work. This survey identifies business usage, delivery, and shipping patterns and critical times of the day or year for business activities. This information will be used by the MTA to develop Worksite Traffic Control plans, identify alternative access routes and make efforts during construction to maintain critical business activities.

During preliminary and final design of the project, subsurface (geotechnical) investigations would be undertaken to evaluate soil, groundwater, seismic, and environmental conditions along the alignment.

Vehicular and Pedestrian Traffic

Construction of the BRT or LRT would temporarily interfere with the normal flow of traffic, causing some lanes and streets to be closed to vehicles for various durations. During final design, site and street specific Worksite Traffic Control Plans would be developed in cooperation with the City of Los Angeles Department of Transportation (LADOT), City of Beverly Hills, City of Santa Monica, and Los Angeles County to accommodate required pedestrian and traffic movements. To the extent practical, traffic lanes will be maintained in both directions, particularly during peak traffic hours. Access to homes and businesses will be maintained throughout the construction period.

Safety and Security

Safety and security during construction would consist of providing for the safe passage of vehicles and pedestrians through the construction area and protecting construction sites and equipment/material storage areas from vandalism and theft.

All standard construction procedures would be implemented to ensure the safety of the public. Detours and existing roadways through and around construction zones would be well lighted and signed. Barriers (e.g., K-rails) would be used to separate the public from work areas where necessary. Pedestrian pathways would be cordoned off and protected from traffic and potential flying objects. Standard traffic control procedures would be used, including flaggers, cones, and flashing lights. Construction staging areas would be fenced and lighted wherever appropriate. Material and equipment storage sites would require perimeter patrols and night security personnel.

3.18.2 Construction Schedule

An example schedule for constructing the Wilshire BRT and Exposition BRT is shown in Tables 3.18-3A and 3.18-3B, respectively. The exclusive BRT lanes would be constructed in three to four block segments with one side of the street (and one BRT lane) placed first, followed by the other side. The duration of this scenario would be approximately 6 weeks.

TABLE 3.18-3A
EXAMPLE CONSTRUCTION SCHEDULE FOR THE WILSHIRE BRT

Task	Approx. Duration (Mos.)	Year 1	Year 2	Year 3	Year 4	Year 5
Traffic Mitigation Measures	12-18					
Stations	12-16					
Exclusive BRT Lane	18-24					
Replacement Parking	12-18					
Systems Installation	6 - 12					
Systems Testing & Integration	10-12					
Pre-Revenue Operations	3-5					

An example schedule for constructing the Exposition BRT is shown in Table 3.18-3B.

TABLE 3.18-3B
EXAMPLE CONSTRUCTION SCHEDULE FOT THE EXPOSITION BRT

Task	Approx. Duration (Mos.)	Year 1	Year 2	Year 3	Year 4	Year 5
At-Grade Stations and Guideway Installation	18-24					
Aerial Structures	12-18					
Systems Installation	6-16					
Systems Testing & Integration	10-18					
Pre-Revenue Operations	3-5					

An example schedule for constructing the Exposition LRT is shown in Table 3.18-3C. If the optional subway were chosen, the schedule would require an additional 12-18 months. Twenty-four hour operation is assumed for construction of underground segments

TABLE 3.18-3C
EXAMPLE CONSTRUCTION SCHEDULE FOR THE EXPOSITION LRT

Task	Approx. Duration (Mos.)	Year 1	Year 2	Year 3	Year 4	Year 5
At-Grade Stations and Guideway Installation	18-24					

TABLE 3.18-3C
EXAMPLE CONSTRUCTION SCHEDULE FOR THE EXPOSITION LRT

Task	Approx. Duration (Mos.)	Year 1	Year 2	Year 3	Year 4	Year 5
Electrical Power System	12-18					
Aerial Structures	12-18					
Systems Installation	6-12					
Systems Testing & Integration	10-18					
Pre-Revenue Operations	3-5					

3.18.3 Construction Impacts

Construction-related impacts are discussed in each of the technical sections of this EIS/EIR (refer to Sections 3.2 through 3.17). The primary construction-related impacts result from the following activities:

- Construction of the subway design option near USC/Exposition Park;
- Construction of the elevated segments of the Exposition BRT or LRT (at La Cienega Boulevard, Pico Boulevard, and Bundy Drive); and
- General construction activities associated with construction of stations/bus canopies and installation of the rail lines.

The primary construction-related impacts include:

- Air quality (Section 3.8A: fugitive dust emissions);
- Noise and vibration (Section 3.9: construction-related noise and vibration);
- Traffic and circulation (Section 3.2: street/lane closures, detours, and construction-related trips);
- Socioeconomics and Land Acquisition/Displacement and Relocation (Sections 3.4 and 3.6: effects on businesses);
- Geology and soils (Section 3.10: soil disposal and worker exposure to contaminated sites);
- Hydrology/water quality (Section 3.11: grading, erosion, and short-term water quality impacts); and
- Cultural resources (Section 3.17: disturbance to archaeological and paleontological resources).

For a detailed discussion of these impacts, please refer to the appropriate sections of this EIS/EIR.