METRO RED LINE
MID-CITY SEGMENT

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DRAFT
SUPPLEMENTAL
ENVIRONMENTAL IMPACT STATEMENT
SUBSEQUENT
ENVIRONMENTAL IMPACT REPORT

Prepared in accordance with the National Environmental Policy Act of 1969, as amended, 42 U.S.C. 4371 *et seq*., the Intermodal Surface Transportation Efficiency Act of 1991, 49 U.S.C. 101 *et seq*., and the California Environmental Quality Act of 1970, as amended, California Public Resources Code, Article 2000, *et seq*.

By the

U.S. Department of Transportation
Federal Transit Administration

and the

Los Angeles County
Metropolitan Transportation Authority

Date of Approval	For:	Federal Transit Administration	Leslie Rogers Region IX Administrator
Date of Approval	For:	Los Angeles County Metropolitan Transportation Authority	Julian Burke Interim Chief Executive Officer

TRANSMITTAL

To:	Kevin Michel Project Manager MTA One Gateway Plaza Los Angeles, CA 90053	**From:**	Gene Anderson Project Manager
		Job No:	4705
Re:	Metro Red Line Mid-City Segment	**Date:**	September 26, 1997
File:	Outgoing Transmittals	**Via:**	Courier

***DESCRIPTION*:** Enclosed is the 2nd MTA Administrative Draft SEIS/SEIR.

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26461 Crown Valley Parkway, Suite 140 ■ Mission Viejo, CA 92691-6377
Telephone: (714) 367-8888/(800)-908-EIRs ■ FAX: (714) 367-8890

DRAFT
SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT
SUBSEQUENT ENVIRONMENTAL IMPACT REPORT

LEAD AGENCIES: U.S. Department of Transportation,
Federal Transit Administration
Los Angeles County Metropolitan Transportation Authority

TITLE OF PROPOSED ACTION: Metro Red Line Mid-City Segment

ABSTRACT: This report documents the environmental impacts of the No Project Alternative, and four alternative subway alignments that would connect the existing Wilshire/Western Red Line Station with a new western terminus station in the Mid-City area of Los Angeles. The proposed 2.3- to 2.6-mile alternative subway alignments would extend westward from the Wilshire/Western Red Line Underground Station under Wilshire Boulevard, turn south on either Wilton Place/Arlington Avenue or Crenshaw Boulevard, turn west on either Pico or Venice Boulevards, and terminate at a station between Pico and Venice Boulevards immediately east of San Vicente Boulevard. An intermediate station would be located at either Olympic and Crenshaw Boulevards or Olympic Boulevard and Arlington Avenue.

This report supplements the Final Supplemental Environmental Impact Statement/Supplemental Environmental Impact Report for this segment, which was finalized in August of 1992. The Los Angeles County Transportation Commission (LACTC) adopted the document in September 1992. The Federal Transit Administration (FTA) approved a Record of Decision in November of 1992. It satisfied the requirements of the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA).

This Supplemental Environmental Impact Statement/Subsequent Environmental Impact Report examines potential areas of impact, including transit and pedestrian circulation, traffic, parking, land use, demographics/accessibility for transit dependent populations/environmental justice, property acquisition and displacement, business disruption during construction, communities and community facilities, safety and security, aesthetics, noise and vibration, air quality and odor, utilities, surface water quality, geology and subsurface conditions, historic resources, archaeological resources, paleontological resources, Section 106 compliance, Section 4(f) evaluation, energy, and electric and magnetic fields. Mitigation measures for the impacts are identified.

FOR ADDITIONAL INFORMATION CONCERNING THIS DOCUMENT, PLEASE CONTACT:

Mr. Ray Sukys, General Engineer
Office of Program Development
Federal Transit Administration
Region IX
211 Main Street
San Francisco, CA 94105
(415) 744-3116

Mr. Kevin Michel, Project Manager
West Side Area Team
Los Angeles County
Metropolitan Transportation Authority
One Gateway Plaza, Mail Stop: 99-22-2
Los Angeles, CA 90012-2932
(213) 922-2854

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S.0 SUMMARY

S.1 History, Background and Purpose

In 1983, the Southern California Rapid Transit District (SCRTD), a predecessor agency of the Los Angeles County Metropolitan Transportation Authority (MTA), completed a *Final Environmental Impact Report, Los Angeles Rail Rapid Transit Project*. Also in 1983, SCRTD and the Urban Mass Transportation Administration (UMTA) completed a *Final Environmental Impact Statement, Los Angeles Rail Rapid Transit Project*. These documents evaluated the original Metro Rail Locally Preferred Alternative (LPA), an 18.6-mile subway with 18 stations. The original LPA followed Wilshire Boulevard from the Los Angeles Central Business District west to Fairfax Avenue, north on Fairfax Avenue, east along Sunset Boulevard serving Hollywood, and north to North Hollywood. The original LPA was selected to serve a major portion of the regional core of Los Angeles, a 75-square mile financial, retail, cultural, and entertainment center for southern California. In 1984, funding was not available for the full original LPA, so an *Environmental Assessment, Los Angeles Rail Transit Project, Union Station to Wilshire/Alvarado (Minimum Operable Segment 1)*, prepared by UMTA and SCRTD, was circulated for the first 4.4-mile segment of the original LPA. Federal funding was approved for this segment, and construction began in 1986. This segment was completed and became operational in 1993.

In 1985, a fire occurred at the Ross Dress-for-Less Store on Third Street, east of Fairfax Avenue. A City of Los Angeles Task Force determined the source of the fire to be naturally occurring underground methane gas that seeped into a confined area of the building with no ventilation. A spark caused the explosion and fire. In its report on the fire,[1] the Task Force identified specific risk zones based on detection of methane gas in the area. The United States Congress subsequently passed a law (Public Law No. 99-1980) stipulating that federal funds could not be used to tunnel in any area identified in the City of Los Angeles study as part of the Risk Zone. Congress also directed the SCRTD to identify and study candidate Metro Rail alignments that avoided the Risk Zone.

In compliance with the congressional mandate, SCRTD initiated a Congressionally Ordered Re-Engineering (CORE) Study in 1986. Over 40 candidate alignments were reviewed during this effort, which included extensive public outreach efforts. Six alignments were assessed in detailed environmental reports, including a *Draft Supplemental Environmental Impact Statement/Subsequent Environmental Impact Report (SEIS/SEIR)*; *Los Angeles Rail Rapid Transit Project* (November, 1987) and an *Addendum to the Draft SEIS/SEIR, Los Angeles Rail Rapid Transit Project* (1988), both prepared by SCRTD. One of the candidate alignments reviewed in the 1987 Draft SEIS/SEIR, called Candidate Alignment 3, included the Mid-City Segment.

In 1988, however, SCRTD's Board of Directors, due to funding constraints, selected a LPA that did not extend farther west than the Wilshire/Western Station. Following the approval of Proposition C in 1991, which provided an additional local revenue source for transit, the Mid-City Segment was revisited in a *Re-Evaluation Report/ Draft Supplemental Environmental Impact Report, Los Angeles Rail Rapid Transit Project for the Mid-City Segment from Wilshire/Western to Pico/San Vicente in the City of Los Angeles with Stations at Olympic/ Crenshaw and Pico San Vicente* (January 1992) prepared by the Federal Transit Administration (FTA - formerly UMTA) and Los Angeles County Transportation Commission (LACTC), a predecessor agency of the MTA. Based on that document, the LACTC adopted the Mid-City Segment as part of the LPA in March 1992, the Final SEIS/SEIR was adopted by the LACTC in September 1992, and FTA issued a Record of Decision by the FTA in November 1992 (*Los Angeles Rail Rapid Transit Project-Metro Rail for the Mid-City Segment from*

[1]/ City of Los Angeles Task Force, *Report on the March 24, 1985 Methane Gas Explosion and Fire in the Fairfax Area*, June 10, 1985.

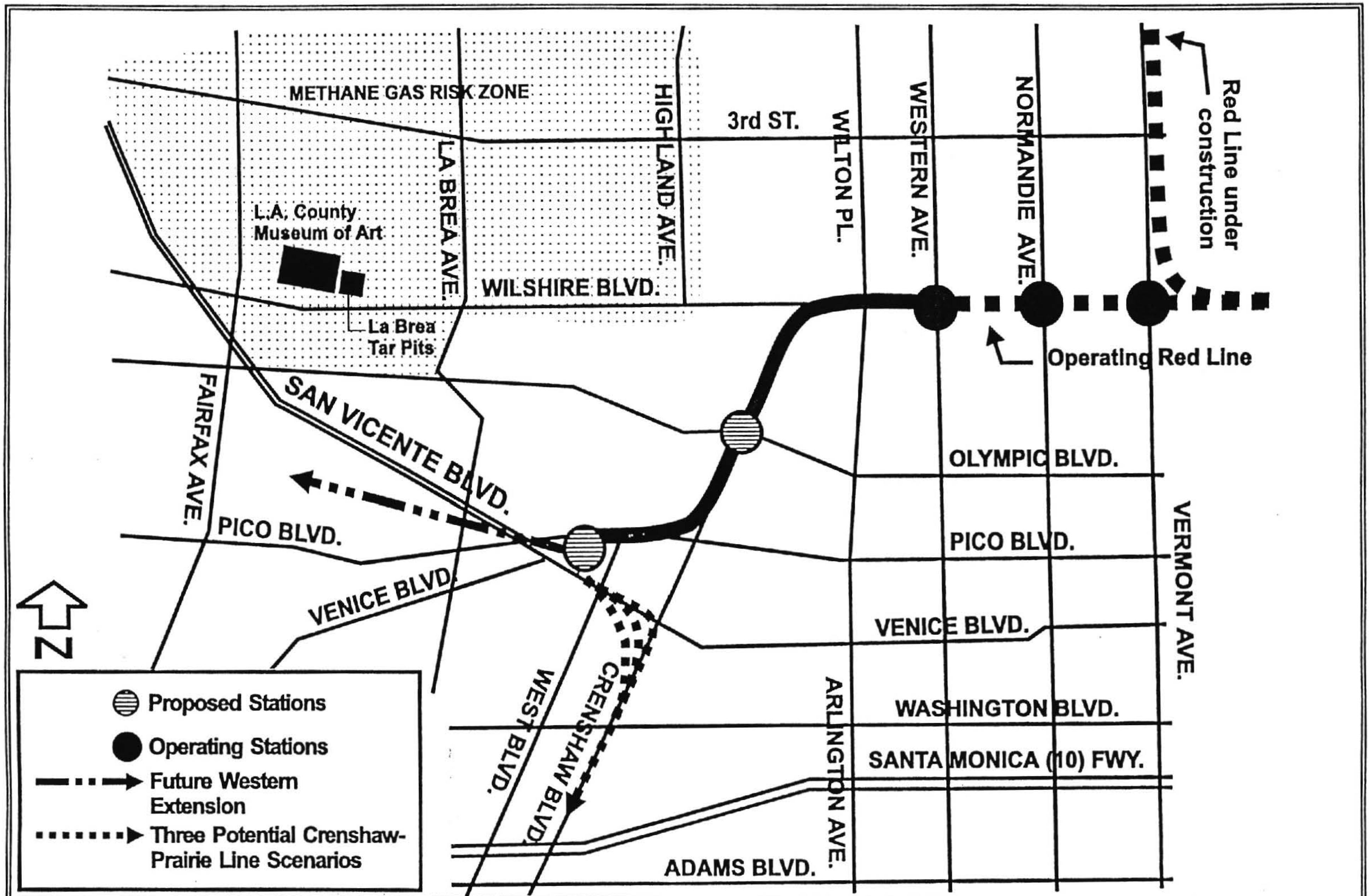

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FIGURE S-1
LOCALLY PREFERRED ALTERNATIVE ANALYZED IN THE 1992 SEIS/SEIR

Wilshire/Western to Pico/San Vicente in the City of Los Angeles with Stations at Olympic/Crenshaw and Pico/ San Vicente Final Supplemental Environmental Impact Statement and Final Supplemental Environmental Impact Report, August 1992). On April 1, 1993 the SCRTD and the LACTC merged into one agency, the Los Angeles County Metropolitan Transportation Authority (MTA). Figure S-1 displays the LPA analyzed in the 1992 SEIS/ SEIR.

Upon commencement of final design work in Spring 1993, additional geotechnical tests were conducted on the original LPA to better understand the properties of the hydrogen sulfide gas identified during preliminary engineering. The additional geotechnical tests indicated that the concentrations and flow of subsurface hydrogen sulfide gas was much higher than originally identified, and that the mitigation measures previously identified in the August 1992 environmental document would not be sufficient to mitigate the impacts to a level of insignificance.

A Tunnel Review Board (TRB) of experts was convened in October 1993 to review the technical feasibility of the adopted LPA. The TRB was composed of seven nationally recognized experts in the fields of underground tunnel design, construction, mining, ventilation, and safety. The TRB recommended raising the alignment above the San Pedro Formation to minimize potential exposure to hydrogen sulfide during construction and operation. The San Pedro Formation is a subsurface geologic layer that has been found, under certain conditions, to contain high levels of methane and hydrogen sulfide gas. In addition, the TRB recommended additional field investigations to verify conditions above the San Pedro Formation, and to determine to the extent possible the quantity and pressure of the gases present.

Following the TRB's recommendations, the MTA conducted a Mid-City Extension Reassessment Study (July 1994) of the original LPA. This study provided additional information regarding the extent and nature of the hydrogen sulfide gas. The Study identified alternatives that would generally raise the alignment of the LPA above the San Pedro Formation and assessed the extent that the alternatives would minimize potential human exposure to hydrogen sulfide gas during project construction and operation.

As a result of the Reassessment Study, the MTA initiated a new SEIS/SEIR in 1994 to assess the environmental impacts of shallow cut-and-cover and aerial configurations along the original Crenshaw Boulevard horizontal alignment. Although both alternatives were determined to be safe to construct and operate, the environmental process determined that both alternatives would have considerable negative impacts on the community. These impacts included significant visual impacts for the aerial alternative as well as extensive property acquisitions and increased traffic noise. The shallow underground required utility relocations and property acquisitions through residential neighborhoods.

To develop an alternative which would reduce these community impacts, the MTA decided to explore a deep-bore tunneling option. Accordingly, in January 1996, the MTA initiated geotechnical testing of an alignment approximately one-quarter mile east of Crenshaw Boulevard. The results of this testing are documented in the *Mid-City Alternative Alignment Gas Explorations Study*, Enviro-Rail, March, 1996. This geotechnical testing, in the Wilton/Arlington corridor, encountered a maximum concentration of 90 parts per million (ppm) of H_2S, significantly lower than the concentrations over 10,000 ppm occurring along the Crenshaw alignment. Based on these findings, the MTA suspended work on the Draft SEIS/SEIR for the Crenshaw alignment and initiated further feasibility analysis of a Wilton/Arlington alignment.

This SEIS/SEIR has been prepared to address changes in the design of the Mid-City Segment. Previous environmental documents completed for this project are available and can be reviewed at the MTA Library, One Gateway Plaza, Floor 15, Los Angeles, CA 90012.

S.2 Alternatives Considered

The current SEIS/SEIR equally analyzes the following four ~~five~~ alternatives:

No Project Alternative

A No Project Alternative assumes that the Metro Red Line Mid-City Segment would not be constructed, and that the existing Wilshire/Western Station would remain as the westerly terminus station of the Red Line. The No Project Alternative was rejected in the March 1992 when the LACTC adopted the Mid-City Segment as part of its LPA.

Wilton/Arlington/Pico Boulevard Approach to Pico/San Vicente Underground Station (Alternative A)

Alternative A is a proposed 2.4-mile, two-station, westerly extension of the existing Metro Red Line. This alternative ~~alignment~~ would extend the subway alignment of the Red Line from the ~~western end of the tail tracks serving the~~ existing ~~underground station at the intersection of Wilshire Boulevard and Western Avenue (~~Wilshire/Western Station~~)~~ to a new underground station just south of Pico Boulevard between San Vicente and West Boulevards. ~~and~~ From the western end of the Wilshire/Western Station the Alternative A alignment ~~it~~ would immediately turn in a southerly direction under private property until it aligns with Wilton Place, immediately south of Leeward Avenue. The alignment would continue under Wilton Place until a point just north of San Marino Street where it would veer slightly westward under private property to allow for a straight approach into a new Olympic/Arlington Station. The Olympic/Arlington Station would be constructed just south of Olympic Boulevard within the ~~under~~ Arlington Avenue right-of-way. ~~The Olympic/Arlington Station entrance plaza would be located on the southwest corner of the intersection of Olympic Boulevard and Arlington Avenue intersection.~~ South of the Olympic/Arlington Station, near West 12th Street, the Alternative A alignment would turn in a westerly direction under private property to a point west of 3rd Avenue and Pico Boulevard, and would proceed in a westerly direction under Pico Boulevard. The alignment would continue in a westerly direction under Pico Boulevard until a point near West Boulevard where it would veer in a slight southerly direction to an underground station on the property, parallel to Pico Boulevard, and ~~on a site~~ bounded by West, Pico, San Vicente, and Venice Boulevards.

The Alternative A alignment would ~~primarily~~ be constructed as twin deep-bore tunnels between the existing Wilshire/Western Station and the Pico Boulevard/Victoria Avenue intersection. ~~except within close proximity to the two stations and on Pico Boulevard west of Victoria Avenue, where~~ Between the Pico Boulevard/Victoria Avenue intersection and West Boulevard tunnel construction would continue using a ~~use the~~ cut-and-cover method. West of West Boulevard the crossover tracks, the Pico/San Vicente Station, and the tail tracks would be constructed within an open trench.

The Olympic/Arlington Station would be a two-level underground subway station approximately 537 feet long with a 450 foot long centerload platform. The Olympic/Arlington Station entrance plaza would be located on the southwest corner of the Olympic Boulevard and Arlington Avenue intersection. The Pico/San Vicente Underground Station, an interim terminus station, would be a one-level station, with a 450 feet long centerload platform, and a tail track of 500 feet. At the Pico/San Vicente Station site the project would include ~~would provide~~ an enlarged bus transfer facility, a park-and-ride facility with an ultimate capacity of up to 1,000 parking spaces in a multi-level structure, a kiss-and-ride facility, bicycle storage facilities, and convenient/safe pedestrian access. Figure S-2 displays the Wilton/Arlington/Pico Boulevard Approach to the Pico/San Vicente Underground Station (Alternative A). As shown in this figure, ~~this~~ Alternative A would allow for a potential future western extension of the Red Line as a subway under Pico Boulevard.

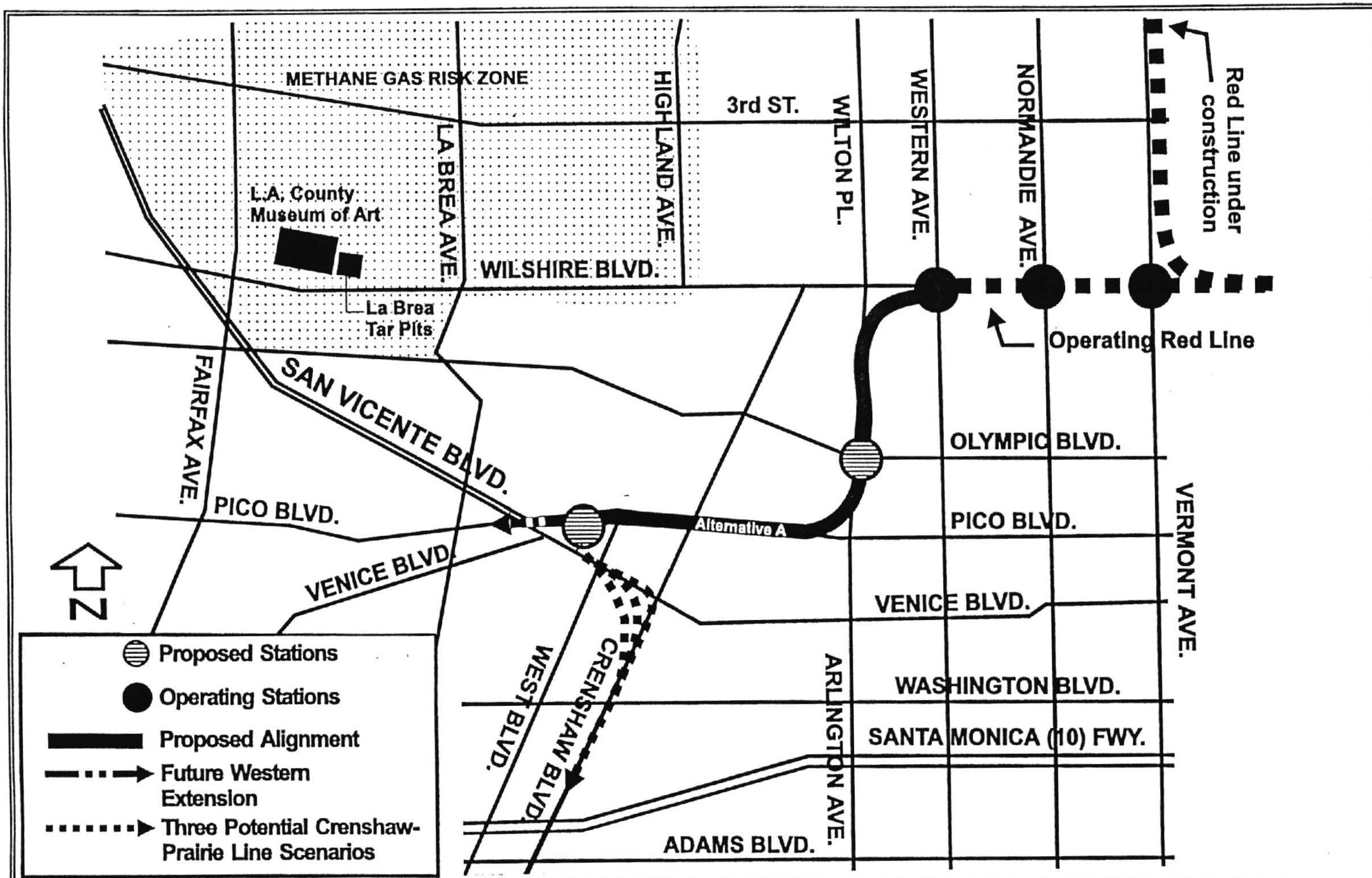

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FIGURE S-2
WILTON/ARLINGTON/PICO BOULEVARD APPROACH TO PICO/SAN VICENTE UNDERGROUND STATION (ALTERNATIVE A)

~~Wilton/Arlington/Venice Boulevard Approach to Venice/San Vicente Open Air (Lower Elevation) Station (Alternative B1)~~

Wilton/Arlington/Venice Boulevard Approach to Venice/San Vicente Open Air Station (Alternative B)

Alternative B would extend the Red Line from the existing Wilshire/Western Station to the proposed Venice/San Vicente Station, a distance of approximately 2.6 miles. The Alternative B~~1~~ alignment is exactly the same as the alignment described above for Alternative A ~~alignment~~ between the existing underground Wilshire/Western Station and the proposed Olympic/Arlington Underground Station. The alignment of Alternative B~~1~~ begins to differ from Alternative A at a point just south of the Olympic/Arlington Station. ~~The Olympic/Arlington Underground Station would be constructed in the same manner as described under Alternative A.~~ Alternative B~~1~~ would continue south from the Olympic/Arlington Station under Arlington Avenue until a point immediately south of Pico Boulevard, where the alignment would turn in a westerly direction under private property traversing towards Venice Boulevard. The alignment would be under Venice Boulevard at a point between 5th and 6th Avenues, where it would continue in a westerly direction until it reaches West Boulevard. At that point it would veer in a slight northerly direction to conclude in a~~n~~ ~~interim~~ terminus station on private property north of Venice Boulevard and just east of San Vicente Boulevard. ~~This alignment would be constructed as twin, deep-bore tunnels except between Victoria Avenue and the Venice San/Vicente Station, where construction would use the cut-and-cover method.~~

The Alternative B alignment would be constructed as twin deep-bore tunnels between the existing Wilshire/ Western Station and the Venice Boulevard/Victoria Avenue intersection. Between the Venice Boulevard/ Victoria Avenue intersection and West Boulevard tunnel construction would continue using a cut-and-cover method. West of West Boulevard the crossover tracks, the Venice/San Vicente Station, and the tail tracks would be constructed as an open air (surface) station.

The Olympic/Arlington Station would be constructed in the same manner as described above under Alternative A.

Alternative B has two construction scenarios for the Venice/San Vicente Station referred to in this document as Alternatives B1 and B2. That portion of the Alternative B alignment between the existing Wilshire/Western Station and the Venice/San Vicente Station site is the same for both the Alternative B1 and B2 station construction scenarios. The purpose for the Alternative B1 and B2 distinction is to environmentally clear Alternative B with two potential construction scenarios for the Venice/San Vicente Station. As such, when Alternative B1 and/or B2 is specifically mentioned in this document it is to clarify which of the construction scenarios is being described for the Venice/San Vicente Station site.

Some further explanation is needed to clarify why Alternative B is being environmentally cleared with two construction scenarios for the Venice/San Vicente Station site. The MTA's current Long Range Transportation Plan describes the Red Line as eventually being extended in a westerly direction from the Pico/ or Venice/San Vicente Station site all the way to a point just west of the I-405 Freeway and Wilshire Boulevard. However, it is not known at this time whether or not it is possible to extend the Red Line in a westerly direction in a subway configuration under Pico Boulevard from the Pico/ or Venice/San Vicente Station site. Preliminary geotechnical testing has indicated that high levels of hydrogen sulfide gas is present at relatively shallow depths in the geological formations immediately west of the Venice/San Vicente Station site. If it is not possible to extend the Red Line as a subway under Pico Boulevard, then another option would be to extend the Red Line in an aerial configuration within the median in San Vicente Boulevard. Additional subsurface gas investigations would be required before the MTA could determine how the Red Line could be extended to the west at some point in the future. Alternative B1 would site the Venice/San Vicente Station at a lower elevation which would allow the

Red Line to be extended as a subway under Pico Boulevard at some point in the future. Alternative B2 would site the Venice/San Vicente Station at a higher elevation which would allow the Red Line to be extended in an aerial configuration above San Vicente Boulevard at some point in the future. Once the Venice/San Vicente Station is constructed the future western extension alignment (subway or aerial) would be fixed. Alternative station construction scenarios B1 and B2 are more fully described below.

- **Venice/San Vicente Open Air (Lower Elevation) Station (Alternative B1)**

The Venice/San Vicente Open Air (Lower Elevation) Station would be a one-level station constructed at an elevation that would place the rails approximately ten feet below the existing grade of the site. The station would have a 450 foot long center-load platform that would be covered by a structure. A 372 foot section of crossover track would be located immediately east of the station platform. The tail track would be 500 feet long and it would be constructed within a retained cut. The Alternative B1 station construction scenario would allow for the Red Line to continue in a westerly direction as a subway under Pico Boulevard, should that option be approved at some point in the future. The Venice/San Vicente Station Open Air (Lower Elevation) would include the same bus and auto facilities described above for the proposed Pico/San Vicente Station. A pedestrian bridge would span the station platform, and connect Venice Boulevard pedestrian walkways and bus stop to the platform and station site. Figure S-3 displays the Wilton/Arlington/Venice Boulevard Approach to the Venice/San Vicente Open Air (Lower Elevation) Station (Alternative B1).

- **Venice/San Vicente Open Air (Higher Elevation) Station (Alternative B2)**

The Venice/San Vicente Open Air (Higher Elevation) Station would be a one-level station constructed at an elevation that would place the rails approximately five feet above the existing grade of the site. The station would have a 450 foot long platform that would be covered by a canopy structure. The raised portion of the site would terminate at the western end of the station. A 372 foot section of crossover track would be located immediately east of the station platform. The tail track structures that would extend for 500 feet beyond the station would be supported by columns. The columns would be at a height of at least 16 feet at the western end to accommodate a future western aerial extension. The Alternative B2 station construction scenario would allow for the Red Line to continue in a westerly direction in an aerial alignment along the median within San Vicente Boulevard, should that option be approved at some point in the future. The Venice/San Vicente Open Air (Higher Elevation) Station would provide all of the ridership facilities that would be constructed under Alternative A. Proposed ridership facilities would include an enlarged bus transfer facility, a park-and-ride facility with an ultimate capacity of up to 1,000 parking spaces in a multi-level structure, kiss-and-ride facilities, bicycle storage facilities, and convenient/safe pedestrian access. A pedestrian bridge would span the station platform, and connect Venice Boulevard pedestrian walkways and bus stop to the platform and station site. Figure S-4 displays the Wilton/Arlington/Venice Boulevard Approach to the Venice/San Vicente Open Air (Higher Elevation) Station (Alternative B2).

Crenshaw Boulevard/Pico Boulevard Approach to Pico/San Vicente Underground Station (Alternative C)

Alternative C is a proposed 2.3-mile, two-station, extension of the existing Metro Red Line. This alignment would extend from the existing Wilshire/Western Station and travel west along Wilshire Boulevard, south along Crenshaw Boulevard, and west along Pico Boulevard. It would include a shallow one-level underground station immediately south of Olympic Boulevard, under Crenshaw Boulevard (Olympic/Crenshaw Station), and a terminus station south of Pico Boulevard and just east of San Vicente Boulevard (Pico/San Vicente Underground Station). The approach and design of the Pico/San Vicente Underground Station is the same as Alternative A, and would include the same bus and park-and-ride facilities. Although Alternative C follows the original 1992 horizontal alignment, the alignment is much shallower, and would occur within the Lakewood Formation. The

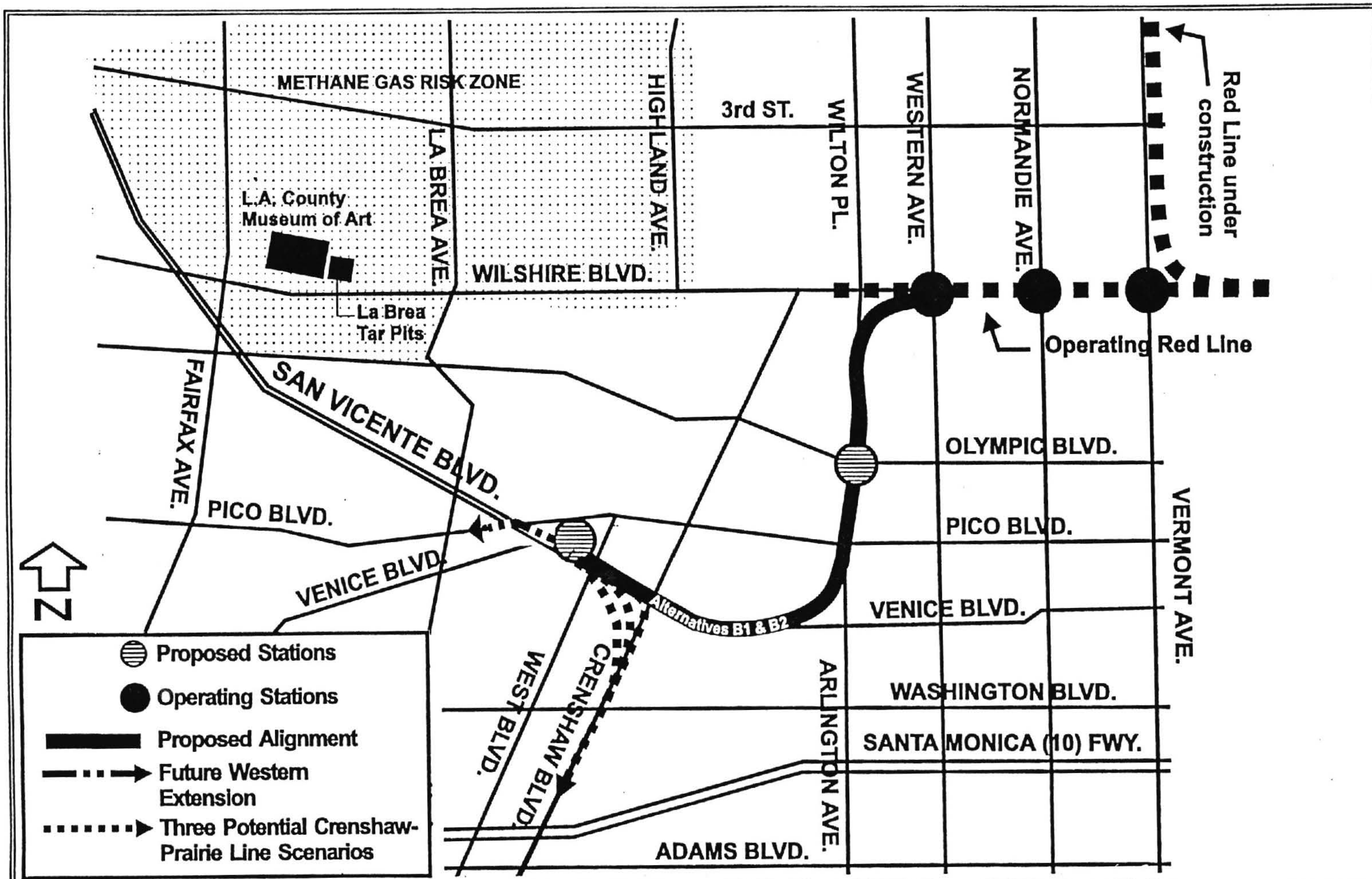

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FIGURE S-3
WILTON/ARLINGTON/PICO BOULEVARD APPROACH TO VENICE/SAN VICENTE STATION
(ALTERNATIVES B1 AND B2)

Alternative C alignment would proceed in a westerly direction from the existing Wilshire/Western Station with the top of the tunnel at a depth of about 35 feet below the ground surface. Near Norton Avenue, the alignment would curve in a southwesterly direction towards Crenshaw Boulevard. From a point just north of 8th Street, to a point approximately 1,100 feet south of Country Club Drive, the tunnels would be constructed using a cut-and-cover methodology because the tunnels are so shallow. The tunnels would also be constructed using cut-and-cover between Victoria Avenue and the Pico/San Vicente Station. Alternative C would require two aboveground vent structures. The Alternative C underground station construction scenario would allow for the Red Line to continue in a westerly direction as a subway under Pico Boulevard, should that option be approved at some point in the future. Figure S-5 displays the Crenshaw/Pico Boulevards Approach to the Pico/San Vicente Underground Station (Alternative C).

S.3 Other Alternatives Considered But Not Analyzed

Wilshire Boulevard Alignment

The original LPA for the Metro Red Line included an underground alignment along Wilshire Boulevard from the Los Angeles Central Business District west to Fairfax Avenue. MTA adopted this LPA after completion of the 1983 EIS/EIR. In 1985, a fire occurred at the Ross Dress-for-Less Store on Third Street east of Fairfax Avenue. A City of Los Angeles Task Force determined the source of the fire to be naturally-occurring underground methane gas that seeped into a confined area of the building with no ventilation. A spark caused the explosion and fire. In its report on the fire, the Task Force identified specific risk zones related to detection of methane gas.

In December 1985, the United States Congress passed Public Law No. 99-1980, which stipulated that federal funds could not be used to tunnel into or through the area identified as potential "risk" or "high risk" in the June 1985 City of Los Angeles report regarding the methane fire in the Fairfax area. Because of this prohibition and the need for federal funding for this project, the Underground Alternative along Wilshire Boulevard was rejected.

Given the prohibition ~~to~~ against tunneling within the methane Risk Zone, an aerial alternative along Wilshire Boulevard was considered in the 1987 Draft SEIS/SEIR. It was determined in the 1987 Draft SEIS/SEIR that an aerial alternative would result in significant environmental impacts and issues, including: the loss of a traffic lane and the on-street parking on a major city thoroughfare, visual impacts, and impacts on historic structures and a historic district and related Section 4(f) issues. There was substantial public opposition to an aerial structure along Wilshire Boulevard.

Crenshaw/Pico Aerial Stations

The Aerial Stations Alternative included a raised vertical alignment in and around station areas. This alternative would have the same horizontal alignment as the 1992 LPA from its eastern end at the Wilshire/Western Station to beneath Crenshaw Boulevard around 9th Street. Along Crenshaw Boulevard in the vicinity of 9th Street, the ground surface begins to slope down towards Olympic Boulevard. At this point, the Aerial Stations Alternative would begin a gradual incline. The top of the tunnel would reach the ground surface in the center of Crenshaw Boulevard south of 9th Street, about 400 feet north of Olympic Boulevard.

Transition structures for the aerial portions of this alignment would support the guideway as it gradually rose from the ground to an ultimate clearance of 16.5 feet (clearance refers to the distance from ground surface to the bottom of the supporting structure). From the location where it breaches the ground surface, each transition area would begin as a continuation of the concrete tunnel walls and roof. As the guideway rose, the roof would be

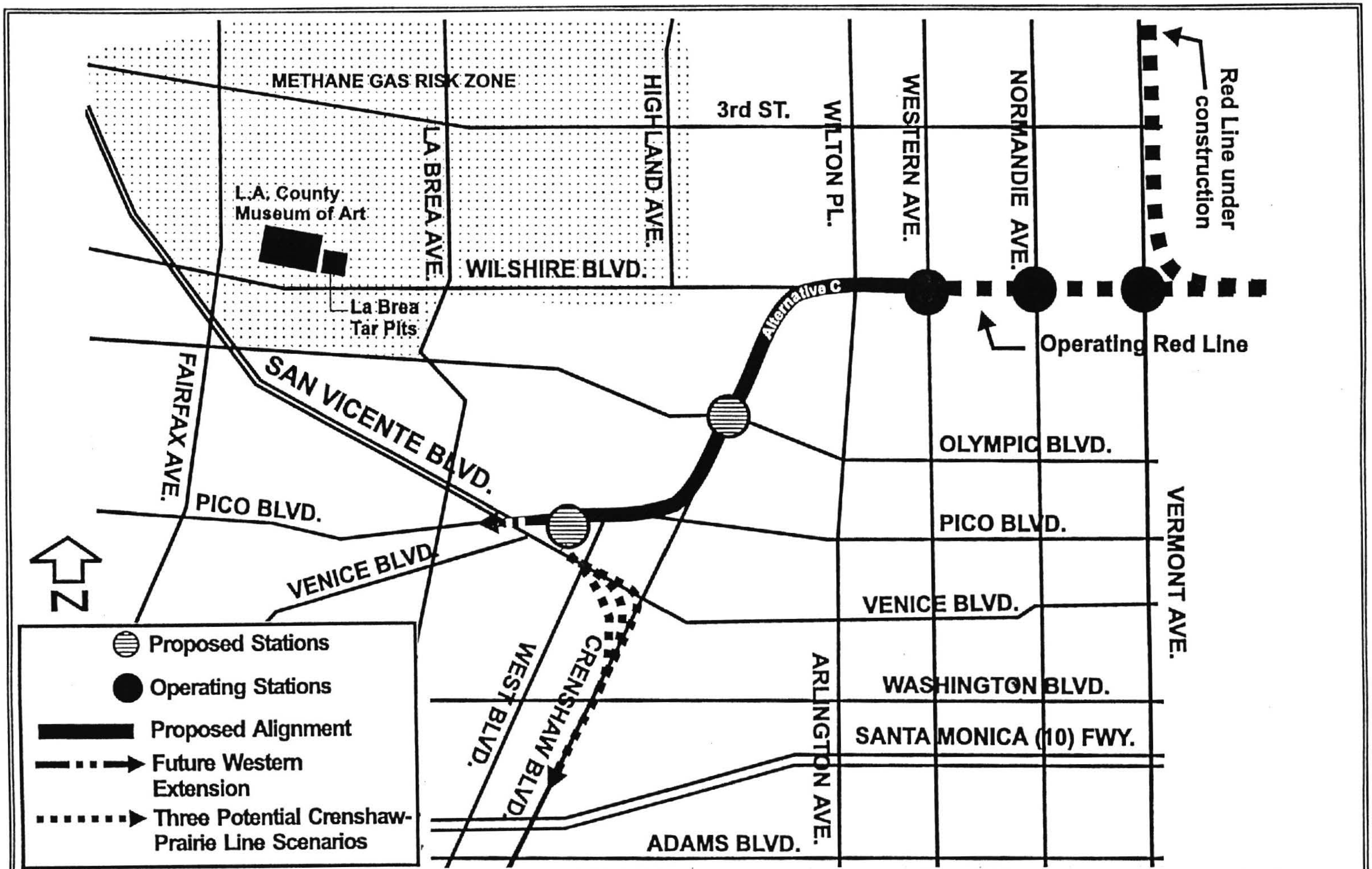

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FIGURE S-4
CRENSHAW/PICO BOULEVARDS APPROACH TO PICO/SAN VICENTE UNDERGROUND STATION (ALTERNATIVE C)

eliminated and the height of concrete side walls would be reduced. The two transition structures would end at abutments north of Olympic Boulevard and south of Country Club Drive.

Transition structures would occupy a 33-foot-wide space in the center of Crenshaw Boulevard. Northbound and southbound traffic lanes of Crenshaw Boulevard would be reconfigured to curve around these structures and alongside a 33-foot-wide center median between the two transition structures. Streets would be widened, as necessary, per City of Los Angeles requirements. Crenshaw Boulevard would be rebuilt where possible with the current number of traffic and parking lanes. Maintaining the street capacity for the entire span (approximately one-half mile) along Crenshaw Boulevard would have required acquisition of a substantial number of properties on both sides of Crenshaw Boulevard.

South of the transition area near Country Club Drive, the alignment would return to an underground configuration. A short segment of the tunnel in this location would require cut-and-cover construction. The subway would curve in a bored tunnel from Crenshaw Boulevard to Pico Boulevard. The curved tunnel segment would cross to the south side of Pico Boulevard.

From this point, the alignment would continue west along the south side of Pico Boulevard, across West Boulevard, and into the Pico/San Vicente station site. This would require acquisition of property on the south side of Pico Boulevard. The top of the tunnel would reach ground surface just west of Plymouth Boulevard. The guideway would gradually rise to achieve a clearance of 16.5 feet as the aboveground structure crosses West Boulevard and enters the Pico/San Vicente station site. East of West Boulevard the guideway would be supported with the use of berms and retaining walls.

The line segment within the station site, which would include a crossover, station platform, and 500-foot tail track, would be supported on columns within the station site. Due to sharp decreases of existing natural grade within the site and the need to maintain fairly level trackage within this segment, the distance between the existing natural grade and the bottom of the structure would increase.

The total height of the Pico/San Vicente aerial station above the existing grade would reach about 45 to 48 feet.

This alternative was dropped from further consideration because of numerous issues which included, but were not limited to excessive amounts of right-of-way acquisitions that would have been required, visual impacts, noise issues associated with traffic on Crenshaw Boulevard and the effects on adjacent residential units, and because of the amount of commercial frontage that would have been lost.

Off-Street Alignments Along Crenshaw Boulevard With Aerial Station

During the early stages of preparing the July 1994 Mid-City Reassessment Study, it became apparent that to accommodate transition structures associated with the aboveground Olympic/Crenshaw Station and retain the same width of Crenshaw Boulevard, property acquisitions would be required along both sides of Crenshaw Boulevard from north of 9th Street to south of Country Club Drive. This observation led to the consideration of modified alternatives that would be partially or fully offstreet in order to reduce the requirements for property acquisitions in this area. Three alternatives with modified horizontal alignments were reviewed: a) a fully off-street alignment, b) a partially off-street alignment, and c) a diagonal alignment across Crenshaw Boulevard. In addition, other variations that become available with an off-street alignment, such as ~~an~~ open trench and berm configurations, were also reviewed.

All of these alternatives were rejected, primarily because of the substantial amounts of property acquisitions that would have been required~~;~~ and because of the potential operational problems associated with jogs in the alignments.

Western Avenue Alignment

Members of the community that did not want the subway alignment to go down Wilton Place/Arlington Avenue suggested that Western Avenue could be a potential alternative route. They suggested that the subway alignment could go south on Western Avenue to the I-10 Freeway and then follow the alignment of the freeway to a point west of the 405 Freeway. A Western Avenue alignment is not feasible for the following reasons:

- The existing tail track that services the Wilshire/Western Station extends approximately ½ block west of Western Avenue under Wilshire Boulevard (See Figure 2-7, Sheet 1 of 11).
- Extending the existing track to Western Avenue would create a large "S" shaped curve that would go under many properties south of Wilshire Boulevard and east of Wilton Place.
- This additional distance would be very costly.
- The trains would have to travel at reduced speeds during the "S" curve, thereby extending travel times.
- In the MTA's Long Range Transportation Plan, the western extension of the Red Line is identified as an east/west corridor between downtown Los Angeles and the west-side. A Western Avenue detour of the western extension of the Red Line would eliminate the east/west movement of passengers and replace it with a north/south movement.
- Terminating the Red Line at the existing Wilshire/Western Station and building another rail line under Western Avenue would require another rail yard for another operating line, and it would require an additional transfer of patrons.
- A goal of the Red Line subway system is to provide quick and convenient service to its patrons to serve the broader "Wilshire Corridor" in an east/west direction. This goal would not be met as successfully with this alternative.

~~In the MTA's Long Range Transportation Plan, the western extension of the Red Line has always been is identified as an east/west corridor between downtown Los Angeles and the west-side. A Western Avenue detour of the western extension of the Red Line would eliminate the east/west movement of passengers and replace it with a north/south movement. If it were to turn south, it would need to turn west as soon as possible to serve the original intended corridor. However, continuation of the Red Line south along Western Avenue would require either: a) a large loop under many more residential properties than currently proposed because the Red Line already extends one-half block beyond Western Avenue beneath Wilshire Boulevard, or b) it would require terminating the Red Line at the existing Wilshire/Western Station and building another rail line under Western Avenue. This new rail line would require another rail yard for another operating line, and it would require an additional transfer of patrons. A goal of the Red Line subway system is to provide quick and convenient service to its patrons to serve the broader "Wilshire Corridor" in an east/west direction. This goal would not be met as successfully with this alternative.~~

S.4 Major Conclusions

Preferred Alternative

Pursuant to NEPA, a draft EIS must identify the lead agency's "Preferred Alternative," if one exists (40 C.F.R. 1502.14(e); Forty Questions No.4(b)). A lead agency's preferred alternative would be the one that best fulfills the mission of the agency taking into consideration economic, environmental, technical, and other factors. The lead agency does not have a preferred alternative at this time.

Environmentally Preferable Alternative

Pursuant to NEPA, a draft EIS should identify the "Environmentally Preferable" alternative from among the alternatives analyzed. The environmentally preferable alternative is referred to under CEQA as the "Environmentally Superior Alternative." The environmentally superior alternative is fully described in Section 10.0 of this document. Based on the information contained in Section 10.0, Alternative B is ~~also~~ the environmentally preferable alternative. Alternative B is environmentally preferable for the following reasons:

- During construction, Alternative B would have less of an affect on traffic than Alternatives A and C. Alternative C would affect traffic along Crenshaw Boulevard between 8th Street and a point 1,100 feet south of Country Club Drive, and it would affect traffic on Olympic Boulevard and Country Club Drive during construction of the cut-and-cover phase of the project. Alternative B would only affect traffic in Arlington Avenue for the distance of the station, rather than a ¾-mile segment, and it would not affect traffic in Olympic Boulevard during construction of the cut-and-cover phase of the project. The effects of cut-and-cover in Pico Boulevard (Alternatives A and C) are much more disruptive to on-street parking and access to local streets than cut-and-cover in Venice Boulevard (Alternative B) since access to local streets is already restricted along Venice Boulevard.

- Alternative B would require substantially less property acquisition and displacement. Alternative C requires substantial acquisitions of property and displacement of people in order to relocate large storm drains and sanitary sewers. Alternative A requires two more property acquisitions than Alternative B. Alternative A requires the relocation of the Eleanor Green Roberts Aquatic Center and it requires the acquisition of property on the southeast corner of Pico and West Boulevards to allow for the relocation of the storm drain and the construction of the underground station.

- Alternative B would disrupt fewer businesses than either Alternative A or C. Alternatives A and C would disrupt businesses along Pico Boulevard during the cut-and-cover phase of construction and Alternative C would disrupt businesses along Crenshaw Boulevard between 8th Street and a point 1,100 feet south of Country Club Drive during cut-and-cover construction activities. Alternative B would not affect businesses along Venice Boulevard.

- Alternatives A and C would require much more cut-and-cover to relocate sewers and storm drains than Alternative B.

- Alternative B's open air station would avoid the potential subsurface H_2S problems at the Venice/San Vicente Station site.

S.5 Intended Uses of the SEIS/SEIR

This document is a Draft SEIS/SEIR, fulfilling the requirements of NEPA and CEQA. This Draft SEIS/SEIR will be used by federal, state, regional, and local agencies to assist in the selection of a LPA, and to make discretionary decisions regarding the project, including decisions regarding project funding. These agencies would use the Draft SEIS/SEIR as part of the process of issuing permits or approvals necessary to construct the project.

It is anticipated that the Final SEIR/SEIS will be used to obtain the following discretionary actions:

- To be used as the basis for the Federal Transit Administration's Record of Decision on the Mid-City Segment, consistent with the National Environmental Policy Act (NEPA);
- To be certified by MTA to comply with CEQA;
- To be used as the basis for development of a Mitigation Monitoring and Reporting Program for adoption by MTA, consistent with the requirements of CEQA;
- Serve as the basis for a statement of Findings and Statement of Overriding Considerations for adoption by MTA, consistent with the requirements of CEQA;
- Provide the basis for MTA adoption of the project;
- Provide sufficient preliminary engineering information needed to begin final engineering; and
- To be used by responsible and trustee agencies during their permitting processes for the project.

It is anticipated that the Final SEIR/SEIS could ~~will~~ be used in support of obtaining ~~for~~ the following permits:

- U.S. Environmental Protection Agency (EPA)-construction permits;
- California Regional Water Quality Control Board, Los Angeles Region (RWQCB)-construction permits, NPDES permits;
- South Coast Air Quality Management District (SCAQMD)-Authority to Construct permit, Authority to Operate permit;
- Los Angeles County Department of Public Works, Flood Control Division-approvals for storm drain improvements;
- City of Los Angeles-Approvals required for changes to sewers, storm drains and City streets.

S.6 Issues Raised By Agencies and the Public

The following concerns were raised by Agencies and/or the public regarding the proposed project:

- Preference for a Wilshire Boulevard or Western Avenue alignment;
- Hydrogen sulfide gas;
- Settlement;
- Noise and vibration;
- Dust;
- Acquisition of properties and relocation of people;
- Traffic disruption during construction;
- Neighborhood disruption during construction;
- Length of the construction process;
- Project cost;
- Proximity of project to schools, and impacts on school children;
- Increases in crime;
- Impact of alignment and Olympic/Arlington Station on residential neighborhood.

S.7 Areas of Controversy

In accordance with Section 15123 of the State CEQA Guidelines, the following list identifies "areas of controversy known to the lead agency including issues raised by agencies and the public."

- In response to the Notice of Preparation and public outreach program, members of the public have raised the issue of reconsidering an alignment along Wilshire Boulevard.
- In response to the Notice of Preparation and public outreach program, issues related to potential adverse effects on local schools have been raised by a number of individuals.
- In response to the Notice of Preparation and public outreach program, members of the public have raised concerns regarding the safety of constructing an underground tunnel through this area, given the known levels of hydrogen sulfide and methane gas.

S.8 Issues to Be Resolved

In accordance with Section 15123 of the State CEQA Guidelines, the following ~~list~~ identifies "issues to be resolved including the choice among alternatives and whether or how to mitigate the significant effects."

- The selection of the Locally Preferred Alternative will occur after the review of this Draft SEIS/SEIR is complete. It will be identified in the Final SEIS/SEIR.

S.9 Summary of Environmental Impacts and Proposed Mitigation Measures

Table S-1 summarizes by subject area the potential environmental impacts and proposed mitigation measures for each of the alternatives under consideration in this Draft SEIS/SEIR. Determinations of significance are provided in accordance with CEQA.

Table S-1 is organized to allow the reader to see a side-by-side comparison of the impacts (by alternative) immediately followed by the ~~and~~ mitigation measures ~~by alternative~~.

Following is a listing by page number where each environmental topic is located in Table S-1:

Table S-1
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

No Project	Alternative A (Wilton/Arlington/ Pico)	Alternative B1 (Wilton/Arlington/ Venice, Lower Elevation)	Alternative B2 (Wilton/Arlington/ Venice, Higher Elevation)	Alternative C (Crenshaw/Pico)
SECTION 7.1 - TRANSIT AND PEDESTRIAN CIRCULATION				
1. Construction Impacts - Transit Service				
No disruption to transit service would occur.	Impacts for Alternatives A, B1, B2, and C would be the same, and include: Existing transit would experience minor disruptions in service along areas undergoing cut-and-cover construction and during utility relocation activities which would occur along: (Alternative A) Arlington Avenue for 600 feet south of Olympic Boulevard, Pico Boulevard between Victoria Avenue and San Vicente Boulevard, and Crenshaw Boulevard for 100 feet north and south of Pico Boulevard; (Alternative B) along Arlington Avenue the same as Alternative A, Venice Boulevard between Victoria Avenue and San Vicente Boulevard, and Crenshaw Boulevard for 100 feet north and south of Venice Boulevard; and (Alternative C) Crenshaw Boulevard between 8th Street and a point 1,100 feet south of Country Club Drive, and along Pico Boulevard the same as Alternatives A. All build alternatives would effect Wilshire Boulevard between Western Avenue and Manhattan Place for a short period of time when the tunnel boring machines are removed.			
	Existing bus stops located in cut-and-cover construction areas would be affected during-installation of the concrete decking. No bus routes would be eliminated, and no existing bus stops would be closed. No loss of ridership would be expected to occur.			
Mitigation Measures				
No mitigation measures would be required.	Mitigation measures for Alternatives A, B1, B2, and C would be the same, and include: The MTA will maintain access to bus stops wherever possible during the construction period. Where required, bus stops will be relocated to areas within reasonable walking distance from the current site, and/or to achieve the most direct pedestrian access to the site.			
Unavoidable Significant Adverse Impacts				
All alternatives would have a less than significant impact.				
2. Construction Impacts - Transit Service				
The Pico/Rimpau Transit Center would remain at its current location.	Impacts for Alternatives A, B1, B2, and C would be the same, and include: Construction would result in the need to temporarily relocate the existing Pico/ Rimpau Transit Center.			
Mitigation Measures				
No mitigation would be required.	Mitigation measures for Alternatives A, B1, B2, and C would be the same, and include: MTA will provide a temporary transit transfer facility within the vicinity of the Pico/ or Venice/San Vicente Station site if the existing Pico/Rimpau Transit Center has to be closed during construction. MTA Line 212 and the Midtown Dash Line will be modified slightly to include pick-ups and drop-offs within the transit transfer facility in the Pico/ or Venice/San Vicente Station. The MTA will coordinate with all public transit agencies serving the project area to ensure that transit users receive advanced notification of any necessary alterations in bus routes or in bus stop locations.			
Unavoidable Significant Adverse Impacts				
All alternatives would have a less than significant impact.				

Table S-1
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

No Project	Alternative A (Wilton/Arlington/ Pico)	Alternative B1 (Wilton/Arlington/ Venice, Lower Elevation)	Alternative B2 (Wilton/Arlington/ Venice, Higher Elevation)	Alternative C (Crenshaw/Pico)
3. Construction Impacts - Pedestrian Circulation				
No significant impacts to pedestrian circulation would occur.	Impacts for Alternatives A, B1, B2, and C would be the same, and include: Pedestrian circulation would be disrupted along areas undergoing cut-and-cover construction, during utility relocation activities, and during the removal of the TBM from within Wilshire Boulevard. The disrupted areas are the same as those described above in construction impact #1. Impacts for Alternatives A, B1, B2, and C would be the same, and include: Students that live south of Venice Boulevard and who walk to Los Angeles High School currently cut across the Pico/Venice/San Vicente site. During construction these students would be required to walk around the construction site. Students that walk to Pio Pico School that live north of Olympic Boulevard would potentially have to pass the Olympic/Arlington Station construction site.			
Mitigation Measures				
No mitigation would be required.	Mitigation measures for Alternatives A, B1, B2, and C would be the same, and include: To ensure that sidewalk closures due to construction do not impact pedestrian safety (i.e. encouragement of jay-walking), the MTA will require their contractors to maintain safe pedestrian access through and/or around active construction areas, through application of standard MTA construction area pedestrian safety measures. The MTA will implement standard construction area pedestrian safety measures (such as building temporary sidewalks, or directing pedestrians to alternative paths) to ensure that safe pedestrian access through and/or around active construction areas is maintained.			
Unavoidable Significant Adverse Impacts				
All alternatives would have a less than significant impact.				
4. Construction Impacts - Pedestrian Circulation				
No significant impacts to student pedestrians would occur.	Impacts for Alternatives A, B1, and B2 would be the same, and include: Students that walk to Pio Pico School that live north of Olympic Boulevard would potentially have to pass the Olympic/Arlington Station construction site.			No impact.
Mitigation Measures				
No mitigation would be required.	Mitigation measures for Alternatives A, B1, and B2 would be the same, and include: MTA will provide crossing-guards for the students that have to pass the Olympic/Arlington Station construction site.			No mitigation would be required.
Unavoidable Significant Adverse Impacts				
All alternatives would have a less than significant impact.				
5. Operation and Maintenance Impacts - Public Transit				
No significant impacts would occur.	Impacts for Alternatives A, B1, B2, and C would be the same, and include: There would be no significant impacts on the transit system resulting from the implementation of the proposed Metro Red Line Mid-City Segment project. A positive impact of the project is the reduced travel time patrons would benefit from by riding the Red Line rather than a bus to get to downtown Los Angeles or other destinations along Wilshire Boulevard.			
Mitigation Measures				
No mitigation would be required for any of the alternatives.				

Table S-1
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

No Project	Alternative A (Wilton/Arlington/ Pico)	Alternative B1 (Wilton/Arlington/ Venice, Lower Elevation)	Alternative B2 (Wilton/Arlington/ Venice, Higher Elevation)	Alternative C (Crenshaw/Pico)
5. Operation and Maintenance Impacts - Public Transit (Cont.)				
Unavoidable Significant Adverse Impacts				
All alternatives would have a less than significant impact.				
6. Operation and Maintenance Impacts - Pedestrian Circulation				
No significant impacts would occur.	Impacts for Alternatives A, B1, B2, and C would be the same, and include: Since all the proposed "build" alternatives would be underground, except for the Venice/San Vicente Station (Alternatives B1 and B2), there would be little to no impact on existing pedestrian circulation throughout the project area.			
Mitigation Measures				
No mitigation would be required for any of the alternatives.				
Unavoidable Significant Adverse Impacts				
All alternatives would have a less than significant impact.				
7. Operation and Maintenance Impacts - Pedestrian Circulation				
No significant impacts would occur.	Students or other pedestrians may try to cross the bus paths at the terminus station.	Students or other pedestrians may try to cross over the tail tracks or cross the bus paths at the terminus station.	Same as Alternative A.	Same as Alternative A.
Mitigation Measures				
No mitigation would be required.	The MTA will require the station designers to provide a direct pedestrian route that will separate pedestrians from buses and passenger vehicles. In station areas, MTA will reconstruct sidewalks and add appropriate landscaping to improve the appearance of the area.	The MTA will require the station designers to secure the tail track area, and to provide a direct pedestrian route that will separate pedestrians from buses and passenger vehicles. In station areas, MTA will reconstruct sidewalks and add appropriate landscaping to improve the appearance of the area.	Same as Alternative A.	Same as Alternative A.
Unavoidable Significant Adverse Impacts				
All alternatives would have a less than significant impact.				

Table S-1
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

No Project	Alternative A (Wilton/Arlington/ Pico)	Alternative B1 (Wilton/Arlington/ Venice, Lower Elevation)	Alternative B2 (Wilton/Arlington/ Venice, Higher Elevation)	Alternative C (Crenshaw/Pico)
SECTION 7.2 - TRAFFIC				
8. Construction Impacts - Project Traffic				
No construction impacts on traffic would occur.	Impacts for Alternatives A, B1, B2, and C would be the same, and include: Construction would result in temporary but significant impacts at seven intersections: Wilshire Boulevard and Wilton Place, Wilshire Boulevard and Western Avenue, Arlington Avenue and Olympic Boulevard, Pico Boulevard and La Brea Boulevard, Pico Boulevard and Rimpau Boulevard, Pico Boulevard and Arlington Avenue, and Olympic Boulevard and Rimpau Boulevard.			
Mitigation Measures				
No mitigation would be required.	Although the Metro Red Line Mid-City Extension project is expected to have significant impacts at several locations during construction of the proposed project, no physical mitigation measures are recommended. The construction-related impacts will be temporary in nature and cannot be clearly defined in terms of specific timing or duration. Therefore, as is standard procedure, the mitigation measure is the preparation of construction zone traffic control plans currently subject to approval by the L.A.D.O.T. on an as-needed basis. These plans will address the following potential requirements: detour routes, signing requirements, re-striping plans, truck haul routes, time of day restrictions, and proposed schedule. In addition, location and access to bus stops and adjacent properties will be maintained by the MTA wherever possible during the entire construction period. If bus stops are relocated, they should be within reasonable walking distances. Sidewalks will be maintained or temporarily replaced, or detours to alternatives paths should be provided. Also, the MTA plans will account for advance notification of temporary parking loss and, where necessary, identification of temporary parking replacement or alternative adjacent parking will be made.			
Unavoidable Significant Adverse Impacts				
All alternatives would have a less than significant impact.				
9. Operations Impacts - Project Traffic				
No impacts on traffic would occur.	Impacts for Alternatives A, B1, B2, and C would be the same, and include: Although the project impacts varied slightly between Alternatives, the same nine intersections were impacted for each of the project alternatives.			
Mitigation Measures				
No mitigation would be required.	Mitigation measures for Alternatives A, B1, B2, and C would be the same, and include:			
	<u>La Brea Avenue & San Vicente Boulevard</u> - Cut back the south side of the raised median on San Vicente Boulevard on the eastbound approach, and re-stripe to add a second left-turn lane on the eastbound approach. This will also require removal of one parking space on the eastbound approach.			
	<u>La Brea Avenue & San Vicente Boulevard</u> - Cut back the south side of the raised median on San Vicente Boulevard on the eastbound approach, and re-stripe to add a second left-turn lane on the eastbound approach. This will also require removal of one parking space on the eastbound approach.			
	<u>Pico Boulevard & La Brea Avenue</u> - Change the signal phasing to reflect a protected-permitted phase for the eastbound movement. This improvement will mitigate the project-related impacts to a less than significant level.			

Table S-1
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

No Project	Alternative A (Wilton/Arlington/ Pico)	Alternative B1 (Wilton/Arlington/ Venice, Lower Elevation)	Alternative B2 (Wilton/Arlington/ Venice, Higher Elevation)	Alternative C (Crenshaw/Pico)
9. Operations Impacts - Project Traffic - Mitigation Measures (Cont.)				
	Pico Boulevard & San Vicente Boulevard - Cut back the west side of the raised median on the southbound approach on San Vicente and re-stripe the southbound approach to provide a second left-turn lane. This improvement will mitigate the project-related impacts to a less than significant level.			
	Pico Boulevard & Rimpau Boulevard - Stripe Rimpau Boulevard, currently with 50' curb-to-curb width, to provide for one left-turn lane, one shared left-/right-turn lane, and one right-turn lane for the approach and one lane for the departure. This improvement will mitigate the project-related impacts to a less than significant level.			
	Pico Boulevard & West Boulevard - Re-stripe Pico Boulevard to provide a third westbound through lane. This will be accomplished by re-striping both the eastbound and westbound approaches along Pico Boulevard, currently with 70' curb-to-curb width, resulting in one left-turn lane and two through lanes for the eastbound approach, and one left-turn lane and three through lanes for the westbound approach. This improvement will also require the removal of about six parking spaces on the eastbound approach.			
	Pico Boulevard & Crenshaw Boulevard - Change the signal phasing to reflect a permitted phase for the northbound movement. This improvement will mitigate the project-related impacts to a less than significant level.			
	Pico Boulevard & Arlington Avenue - Re-stripe Pico Boulevard to provide an exclusive westbound right-turn lane. This will be accomplished by re-striping both eastbound and westbound approaches along Pico Boulevard, currently with 60' curb-to-curb width, resulting in one left-turn lane and two through lanes for the eastbound approach and one left-turn lane, two through lanes and one right-turn lane for the westbound approach.			
	Pico Boulevard & Western Avenue - Change the signal phasing to reflect a protected-permitted phase for the southbound movement. This improvement will mitigate the project-related impacts to a less than significant level.			
	Pico Boulevard & Norton Avenue - Re-stripe Pico Boulevard to provide for an eastbound and westbound left-turn lane. This will be accomplished by re-striping both eastbound and westbound approaches along Pico Boulevard, currently with 56' curb-to-curb width, resulting in one left-turn lane and two through lanes for each approach.			
Unavoidable Significant Adverse Impacts				
All alternatives would have a less than significant impact.				
SECTION 7.3 - PARKING				
10. Construction Impacts - Parking				
No significant impacts would occur.	Impacts for Alternatives A, B1, B2, and C would be the same, and include: A potentially significant construction-related parking impact could occur if construction employees were allowed to park their personal vehicles on the street during construction.			

Table S-1
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

No Project	Alternative A (Wilton/Arlington/ Pico)	Alternative B1 (Wilton/Arlington/ Venice, Lower Elevation)	Alternative B2 (Wilton/Arlington/ Venice, Higher Elevation)	Alternative C (Crenshaw/Pico)
10. Construction - Parking (Cont.)				
Mitigation Measures				
No mitigation would be required.	Mitigation measures for Alternatives A, B1, B2, and C would be the same, and include: The MTA will provide off-street parking which will be sufficient to accommodate construction personnel and/or other contractors during all phases of construction. Contractors will not park on-street or in business parking lots.			
Unavoidable Significant Adverse Impacts				
All alternatives would have a less than significant impact.				
11. Construction Impacts - Parking				
No significant impacts to parking would occur.	Some on-street parking would be temporarily eliminated at the following locations during the relocation of utilities and the cut-and-cover activity associated with construction of the twin tunnels: Arlington Avenue for 600 feet south of Olympic Boulevard; Pico Boulevard between Victoria and Mullen Avenues; Queen Anne Place from a point approximately 500 feet south of its intersection with W. 12th Street and Pico Boulevard.; and Crenshaw Boulevard for a 100-foot distance north and south of Pico Boulevard.	Some on-street parking would be temporarily eliminated at the following locations during the relocation of utilities and the cut-and-cover activity associated with construction of the twin tunnels: Arlington Avenue for 600 feet south of Olympic Boulevard; Venice Boulevard between Victoria Avenue and West Boulevard; and Crenshaw Boulevard for a 100-foot distance north and south of Venice Boulevard.	Same as Alternative B1.	Some on-street parking would be temporarily eliminated at the following locations during the relocation of utilities and the cut-and-cover activity associated with construction of the twin tunnels: Crenshaw Boulevard between 8th Street ans a point 1,100 feet south of Country Club Drive; Pico Boulevard between Victoria and Mullen Avenues; 9th Street between Crenshaw Boulevard and 5th Avenue; Victoria Avenue between 9th Street and Country Club Drive; Olympic Boulevard between Crenshaw Boulevard and Victoria Avenue; Bronson Avenue for approximately 750 feet south of Country Club Drive; Crenshaw Boulevard for a 100-foot distance north and south of Pico Boulevard; and Queen Anne Place from a point approximately 500 feet south of its intersection with W. 12th Street and Pico Boulevard.

Table S-1
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

No Project	Alternative A (Wilton/Arlington/ Pico)	Alternative B1 (Wilton/Arlington/ Venice, Lower Elevation)	Alternative B2 (Wilton/Arlington/ Venice, Higher Elevation)	Alternative C (Crenshaw/Pico)
11. Construction - Parking (Cont.)				
Mitigation Measures				
No mitigation would be required.	Mitigation measures for Alternatives A, B1, B2, and C would be the same, and include: The MTA will provide advanced notification of temporary loss of parking due to construction and, as necessary, will provide temporary replacement parking locations.			
Unavoidable Significant Adverse Impacts				
All alternatives would have a less than significant impact.				
12. Operational Impacts - Parking				
No operational impacts on parking would occur.	Impacts for Alternatives A, B1, B2, and C would be the same, and include: The plans for the Pico/ or Venice/San Vicente Station include a total of 275 spaces provided initially, of which 250 spaces would be designated for use by park-and-ride passengers and 25 by kiss-and-ride passengers. Ultimately, as the parking demand increases, the number of park-and-ride spaces would be increased to 1,000 spaces, 250 spaces at a time, resulting in a total parking supply at build-out of 1,025 spaces.			
Mitigation Measures				
No mitigation would be required.	Mitigation measures for Alternatives A, B1, B2, and C would be the same, and include: The MTA will continuously monitor the usage of park-and-ride spaces at the Pico/ or Venice/San Vicente Station to determine when, and if, additional spaces will be required. When the then-current parking supply is observed to be 80% utilized on 75% of the days observed, the MTA will initiate construction of the next phase of parking supply. If the ultimate parking supply, when built, is observed to be 80% utilized on 75% of the days observed, then additional parking mitigation measures will be implemented, as outlined below.			
	The MTA will encourage developers and employers to take advantage of the City of Los Angeles Parking Management Plan, which is designed to effectively reduce both the cost of parking (by allowing off-site facilities) and the need for parking (by encouraging vanpools, ridesharing and transit usage).			
	The MTA will promote joint development at stations. This approach offers the opportunity to take transit directly to a shopping or employment destination, reducing vehicle trips and parking demand, while supporting the development.			
	The MTA will include provisions for the future accommodation of electric vehicle parking in the design, engineering and construction of station parking facilities. This includes the ability to provide electric outlets in parking lots, and battery charging service stations within station areas.			
	The MTA will provide preferential parking for carpools and vanpools.			
Unavoidable Significant Adverse Impacts				
All alternatives would have a less than significant impact.				

Table S-1
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

No Project	Alternative A (Wilton/Arlington/ Pico)	Alternative B1 (Wilton/Arlington/ Venice, Lower Elevation)	Alternative B2 (Wilton/Arlington/ Venice, Higher Elevation)	Alternative C (Crenshaw/Pico)
13. Operational Impacts - Parking				
No operational impacts on parking would occur.	Impacts for Alternatives A, B1, B2, and C would be the same, and include: The possibility of unplanned, informal park-and-ride activities, resulting in parking intrusion in the immediately adjacent neighborhoods, is recognized as a potential impact of the stations.			
Mitigation Measures				
No mitigation would be required.	Mitigation measures for Alternatives A, B1, B2, and C would be the same, and include: The MTA will conduct studies twice per year of potential parking intrusion in neighborhoods adjacent to each station area.			
	Based on the results of neighborhood parking intrusion studies, the MTA will evaluate the need and desirability of developing preferential parking districts within residential neighborhoods adjacent to station areas. This ongoing program, managed by LADOT, requires local property owners to prepare petitions and obtain City Council approval. Where parking districts are deemed necessary due to the Red Line operation, the MTA will assist residents in preparing and circulating the necessary petitions.			
	The MTA will pursue opportunities to include more project-provided parking for the station areas, where necessary.			
	The MTA will continue to evaluate opportunities to serve the rail stations with local bus lines, and make appropriate modifications to bus routing to encourage and increase transit access to the Red Line. Modifications will include routing area bus lines through the bus transfer facility, relocating bus stops to facilitate pedestrian movement between the bus stop and the station, and coordinating bus and Red Line schedules to allow for convenient and efficient connections and transfers.			
	The MTA will pursue opportunities (where and when necessary) to obtain limited parking rights in existing parking facilities that may have parking availability during the day (such as area churches and commercial businesses that have excess daytime parking available).			
	The MTA will provide bicycle parking at the stations.			
	The MTA will provide safe and convenient pedestrian access to the stations, by providing pedestrian amenities such as sidewalks; nighttime lighting; walkovers, or grade-separated pedestrian facilities to separate pedestrian and vehicle traffic wherever practical; directional signing; direct pathing from bus stops to rail platforms; station security; and convenient access to ticket machines and schedule racks.			
Unavoidable Significant Adverse Impacts				
All alternatives would have a less than significant impact.				
SECTION 7.4 - LAND USE				
14. Acquisition of Existing Structures Impacts				
No existing structures would be acquired.	For the Olympic/Arlington Station, approximately 7 lots would be acquired for use as construction material storage, equipment staging	For the Olympic/Arlington Station the impact would be the same as Alternative A.		To provide station entrances at the northeastern and southwestern corners of the Olympic/Crenshaw intersection for the Olympic/

Table S-1
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

No Project	Alternative A (Wilton/Arlington/Pico)	Alternative B1 (Wilton/Arlington/Venice, Lower Elevation)	Alternative B2 (Wilton/Arlington/Venice, Higher Elevation)	Alternative C (Crenshaw/Pico)
14. Acquisition of Existing Structures Impacts (Cont.)				
	areas, construction offices, and for the station entrance area. All of these properties are located at the southwest corner of the intersection at Olympic Boulevard and Arlington Avenue and consist of commercial, office, and residential uses. The two southernmost single-family residences that would be acquired (one on Arlington Avenue and one on Westchester Place) would not be demolished; instead they would be used as construction offices. They would be resold after construction is complete. This would help preserve the fabric of the neighborhood.			Crenshaw Station five commercial buildings housing eleven businesses would have to be acquired.
No existing structures would be acquired.	For the Pico/San Vicente Station, approximately 14 buildings would be acquired in the vicinity of the area where Venice, Pico and San Vicente Boulevards converge. The acquisition would include three multi-family residential buildings containing 41 rentable units, nine commercial/retail buildings (one of the nine commercial buildings has four residential apartments on the second floor), one church (in a commercial building), the Pico/Rimpau Transit Center (already owned by the MTA), and the Eleanor Green Roberts Aquatic Center. In addition, four vacant lots and one parking lot, all of which are located west of West Boulevard	Impacts for the Venice/San Vicente Station would be the same as discussed under Alternative A, except that the existing Eleanor Green Roberts Aquatic Center and the commercial building on the southeast corner of Pico and West Boulevards would not be acquired and demolished.		Same impact as Alternative A.

Table S-1
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

No Project	Alternative A (Wilton/Arlington/ Pico)	Alternative B1 (Wilton/Arlington/ Venice, Lower Elevation)	Alternative B2 (Wilton/Arlington/ Venice, Higher Elevation)	Alternative C (Crenshaw/Pico)
14. Acquisition of Existing Structures Impacts (Cont.)				
	between Venice, San Vicente, and Pico Boulevards would be acquired.			
No existing structures would be acquired.	One commercial building would be acquired on the southeast corner of Pico and West Boulevards in order to relocate the existing storm drain.	The commercial building on the southeast corner of Pico and West Boulevards would not be acquired and demolished.		Same impact as Alternative A.
No existing structures would be acquired.	Alternatives A and B would not require a construction staging area on the southwest corner of Wilshire and Crenshaw Boulevards.			A construction staging area would be located at the southwest corner of Wilshire and Crenshaw Boulevards in the vicinity of the existing MTA parking lot. To make room for this construction work area, all of the properties on the west side of Crenshaw Boulevard between Wilshire Boulevard and 8th Street would be acquired. The properties that would be acquired include: nine single-family residences, eight multi-family buildings containing 39 units, one commercial building, and one church building.
No existing structures would be acquired.	Alternatives A and B would not acquire these properties.			Due to the shallow tunneling within Crenshaw Boulevard, some underground utility lines (sewer lines and storm drains) would need to be relocated. In total, utility relocations would acquire and demolish: 15 single-family residences, one multi-family building with five units, and three commercial buildings housing five businesses.

Table S-1
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

No Project	Alternative A (Wilton/Arlington/ Pico)	Alternative B1 (Wilton/Arlington/ Venice, Lower Elevation)	Alternative B2 (Wilton/Arlington/ Venice, Higher Elevation)	Alternative C (Crenshaw/Pico)
14. Acquisition of Existing Structures Impacts (Cont.)				
No existing structures would be acquired.	Alternatives A and B would not accquire these properties.			Single properties on the southwest corner of Wilshire Boulevard and Norton Avenue and on the northwest corner of Pico Boulevard and Victoria Avenue would be acquired to construct ventilation shafts for the subway tunnel segments. The Wilshire/Norton property is vacant, but there is one commercial building on the Pico/ Victoria property that would have to be demolished.
No impact would occur.	Impacts for Alternatives A, B1, B2, and C would be the same, and include: Potential negative effects would be associated with the creation of nuisances, those being vacant structures which could be accessed by the homeless, gangs, criminals and/or juvenile delinquents. The types of activities that could reasonably be anticipated to occur include, but are not necessarily limited to, vandalism to adjacent uses such as graffiti and other property damage, property theft and burglaries, drug dealing, the creation of fire hazards, and other crimes associated with the presence of individuals which could use vacant structures for illicit/illegal activities.			
Mitigation Measures				
	Mitigation measures for Alternatives A, B1, B2, and C would be the same, and include: To ensure that structures acquired by MTA do not create a nuisance, all property will be demolished, used as field offices, or for storage by MTA within 6 months, if possible. Security and graffiti removal will be provided.			
Unavoidable Significant Adverse Impacts				
All alternatives would have a less than significant impact.				
15. Maintenance of Vacant Land Impacts				
No significant impacts are anticipated.	Impacts for Alternatives A, B1, B2, and C would be the same, and include: The potential exists for property acquired for construction staging areas and other construction uses to remain vacant for an extended period of time, thus increasing the potential to exacerbate blighting influences in the area.			

Table S-1
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

No Project	Alternative A (Wilton/Arlington/ Pico)	Alternative B1 (Wilton/Arlington/ Venice, Lower Elevation)	Alternative B2 (Wilton/Arlington/ Venice, Higher Elevation)	Alternative C (Crenshaw/Pico)
15. Maintenance of Vacant Land Impacts (Cont.)				
Mitigation Measures				
No mitigation would be required.	Mitigation measures for Alternatives A, B1, B2, and C would be the same, and include:			
	Prior to project operations, the MTA will develop and implement a joint development program in collaboration with other appropriate public agencies and community groups focused on the re-use and disposition of remaining parcels to ensure that these properties do not remain vacant for a long period of time and are re-used for beneficial purposes, consistent with community needs. The MTA will demolish structures as quickly as possible after purchase and relocation of tenants, unless buildings are used as field offices or for storage. All sites will be secured with fencing and maintained on a regular basis.			
	Prior to operation of the Red Line operations along the Mid-City Segment the MTA will participate in a neighborhood planning process for developing MTA real property assets and linking land use and transportation policy. This commitment by the MTA will involve a strategic process to include pre-development, development, and implementation and neighborhood preservation planning to augment the quality of the built environment adjacent to transit facilities and corresponding neighborhoods. A site specific set of guidelines and standards will be developed to assist the MTA in securing private sector development partners to coordinate, implement, and manage a strategic development program while preserving existing neighborhoods.			
	Until such time as all unused properties remaining are disposed of or developed, MTA will landscape and maintain all vacant areas created by the project alternatives. Maintenance and security measures will include providing fencing, screening (if appropriate), lot cleanup, landscaping maintenance, and graffiti removal.			
Unavoidable Significant Adverse Impacts				
All alternatives would have a less than significant impact.				
16. Compatibility and Consistency with Adopted Plans and Policies Impacts				
None of the transit-related goals, plans and/or policies applicable to the project that are contained in General Plan or other approved Specific Plans would be implemented in the foreseeable future. This would include, but not be limited to, the general desire to develop a mass transit system to better serve the needs of area residents; to link neighborhoods and residents in the	Impacts for Alternatives A, B1, B2, and C would be the same, and include: All of the build alternatives are compatible and consistent with the adopted plans and policies discussed in the document. All of the build alternatives would help implement the mass transit goals and polices contained in the adopted plans. No zone changes or plan amendments are being sought by the MTA for any of the build alternatives.			

Table S-1
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

No Project	Alternative A (Wilton/Arlington/ Pico)	Alternative B1 (Wilton/Arlington/ Venice, Lower Elevation)	Alternative B2 (Wilton/Arlington/ Venice, Higher Elevation)	Alternative C (Crenshaw/Pico)
16. Compatibility and Consistency with Adopted Plans and Policies Impacts (Cont.)				
project area with employment, educational, service, and entertainment centers throughout the City.				
Mitigation Measures				
For the identified impacts the mitigation is the development of one of the build alternatives.	Mitigation measures for Alternatives A, B1, B2, and C would be the same, and include: The MTA will not seek zone changes, General Plan, or Specific Plan amendments to increase the development potential of land at or near stations in order to help assure the integrity of existing single-family neighborhoods.			
Unavoidable Significant Adverse Impacts				
All alternatives would have a less than significant impact.				
SECTION 7.5 - DEMOGRAPHICS/ACCESSIBILITY FOR TRANSIT/ENVIRONMENTAL JUSTICE				
17. Accessibility for Transit-Dependent Populations Impacts				
Rail access would not be provided to transit-dependent populations in the Mid-City area consisting of: youth, aged, households without private transportation, and households below the poverty level.	Impacts for Alternatives A, B1 and B2 would be the same, and include: The youth and the aged have a combined total of 19,795 residing in the station census tract areas and 10,204 living in the station influence areas that the Red Line would provide a mode of transportation for.			The youth and the aged have a combined total of 16,229 residing in the station census tract areas and 9,872 living in the station influence areas that the Red Line would provide a mode of transportation for.
	The total number of people that would not have private transportation that the Red Line would provide a mode of transportation for within the Alternative A and B station census tract areas is 5,136, and the total within the station influence areas is 2,585.			The total number of people that would not have private transportation that the Red Line would provide a mode of transportation for within the station census tract areas is 3,910, and the total within the station influence areas is 2,200.

Table S-1
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

No Project	Alternative A (Wilton/Arlington/ Pico)	Alternative B1 (Wilton/Arlington/ Venice, Lower Elevation)	Alternative B2 (Wilton/Arlington/ Venice, Higher Elevation)	Alternative C (Crenshaw/Pico)
17. Accessibility for Transit-Dependent Populations Impacts (Cont.)				
	The total number of households below the poverty level that the Red Line would provide a mode of transportation for within the Alternative A and B station census tract areas is 15,364, and the total within the station influence areas is 8,692.			The total number of households below the poverty level that the Red Line would provide a mode of transportation for within the station census tract areas is 11,921, and the total within the station influence areas is 7,263.
Mitigation Measures				
Implementation of any of the build alternatives would mitigate the loss of rail access to the transit-dependent populations in the Mid-City area.	Mitigation measures for Alternatives A, B1, B2, and C would be the same, and include: The impacts to transit-dependent populations would be beneficial, therefore, no mitigation is required.			
Unavoidable Significant Adverse Impacts				
The loss of the rail access transit benefit is considered a significant adverse impact.	All build alternatives would have a less than significant impact.			
18. Vacancy Rates Impacts				
No effect on the vacancy rate in the Mid-City area.	Alternatives A and B would acquire 3 and demolish 1 single-family units and 3 multi-family buildings with 45 units. If the two southern most single-family dwelling units are acquired (for the Olympic/Arlington Station), they would not be demolished; they would be used for construction office space. The loss of this number of housing units is not considered a significant effect as to the vacancy rate in the area since it represents about two-tenths of one percent of the total renter occupied housing units (19,216), and about two percent of the vacant units (2,216).			The of 24 single-family units and 13 multi-family buildings with 89 units would be acquired and demolished. The loss of 113 residential units would result in a significant effect since it represents a five percent loss in the number of vacant units (2,216).
Mitigation Measures				
No mitigation is required.	No impacts were identified that require mitigation.			The MTA will encourage residential redevelopment of the residential properties acquired for this alternative.

Table S-1
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

No Project	Alternative A (Wilton/Arlington/ Pico)	Alternative B1 (Wilton/Arlington/ Venice, Lower Elevation)	Alternative B2 (Wilton/Arlington/ Venice, Higher Elevation)	Alternative C (Crenshaw/Pico)
18. Vacancy Rates (Cont.)				
Unavoidable Significant Adverse Impacts				
No unavoidable adverse impacts were identified.				The loss of 113 residential units under Alternative C would result in a significant adverse effect to the vacancy rate since it represents a five percent loss in the number of vacant units in the Mid-City area.
19. Environmental Justice Impacts				
No significant impacts would occur.	Impacts for Alternatives A, B1, B2, and C would be the same, and include: No environmental justice impacts are anticipated. The project would improve transit services to Mid-City's transit-dependent area by connecting people to job opportunities outside of the area and saving them time and money with more efficient transportation service.			
Mitigation Measures				
No mitigation would be required for any of the alternatives.				
Unavoidable Significant Adverse Impacts				
All alternatives would have a less than significant impact.				
SECTION 7.6 - PROPERTY ACQUISITION AND DISPLACEMENT				
20. Residential Acquisitions and Resident Displacement Impacts				
The No Project Alternative would not result in the acquisition of private property and displacement of residents.	It is estimated that 3 single-family residential units would be acquired at the Olympic/Arlington Station site, and 9 people would be displaced. Residential acquisitions for the Pico/San Vicente Station include 45 multi-family residential units within 4 apartment buildings, including four apartments on the second floor of a commercial building. These residential acquisitions would displace an estimated 140 people. In total, Alternative A would acquire 3 single-family residences, 3 multi-family buildings, and 4 apartments on the second floor of a commercial building. These acquisitions would displace an estimated 149 residents.			To establish the construction staging area on the west side of Crenshaw Boulevard between Wilshire Boulevard and 8th Street 9 single-family residences and 8 multi-family buildings with 39 units would be acquired. For utility relocations 15 single-family residences and 1 multi-family buildings with 5 units would be acquired. For the Pico/San Vicente

Table S-1
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

No Project	Alternative A (Wilton/Arlington/ Pico)	Alternative B1 (Wilton/Arlington/ Venice, Lower Elevation)	Alternative B2 (Wilton/Arlington/ Venice, Higher Elevation)	Alternative C (Crenshaw/Pico)
20. Residential Acquisitions and Resident Displacement Impacts (Cont.)				
				Station include 45 multi-family residential units within 3 apartment buildings, plus 4 apartments on the second floor of a commercial building would be acquired. Altogether, 24 single-family residences and 13 multi-family buildings with 89 dwelling units, or a total of 113 housing units would be acquired. An estimated 344 residents would be displaced.
Mitigation Measures				
No mitigation would be required.	Mitigation measures for Alternatives A, B1, B2, and C would be the same, and include:			
	The MTA will apply acquisition and relocation policies to assure compliance with the Uniform Act and Amendments. All real property acquired by the MTA will be appraised to determine its fair market value. An offer of just compensation, which shall not be less than the approved appraisal, will be made to each property owner. Each homeowner, renter, business, or nonprofit organization displaced as a result of the project will be given advanced written notice and would be informed of the eligibility requirements for relocation assistance and payments.			
	Pursuant to the Uniform Relocation Act MTA will make referrals to comparable, decent, safe and sanitary replacement housing which is within a person's financial means before that person is displaced. In the event that such replacement housing is not available to "re-house" persons displaced by the project within the statutory limits for replacement housing payments, the MTA will provide Last Resort Housing in a number of ways, including: • Rehabilitating or constructing additions to existing replacement dwellings and making them available to the displaced person; • Constructing new housing to be rented or sold to displaced persons for amounts within their financial means; • Physically relocating comparable dwellings to replacement site; • Purchasing existing housing to be rented or sold to displaced persons for amounts within their financial means; • Removing barriers or rehabilitating structures to accommodate handicapped displaced persons when suitable replacement housing is not available; • Making replacement housing payments in excess of the statutory limits of $22,500 for owner/occupants and $5,250 for renters. • Offering a direct loan, or other financing techniques, to assist displaced persons in purchasing comparable replacement dwellings.			
	All eligible displaced persons have freedom of choice in the selection of comparable replacement housing, and the MTA will not require any displaced person, without his/her written consent, to accept a replacement dwelling referral by the MTA. If a displaced person decides not to accept the replacement housing referred by the MTA, the displaced person may secure a comparable replacement dwelling of his/her choice, providing it meets decent, safe, and sanitary housing standards.			

Table S-1
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

No Project	Alternative A (Wilton/Arlington/ Pico)	Alternative B1 (Wilton/Arlington/ Venice, Lower Elevation)	Alternative B2 (Wilton/Arlington/ Venice, Higher Elevation)	Alternative C (Crenshaw/Pico)
20. Residential Acquisitions and Resident Displacement (Cont.)				
Unavoidable Significant Adverse Impacts				
All alternatives would have a less than significant impact.				
21. Commercial Acquisitions and Employee Displacement Impacts				
No commercial properties or businesses would be purchased.	Three commercial properties would be acquired for the Olympic/ Arlington Station. It is estimated that approximately 45 employees would be displaced.	The impacts would be the same as Alternative A.		Commercial acquisitions for the Olympic/Crenshaw Station include 5 commercial buildings housing 11 businesses. These acquisitions would displace an estimated 45 employees.
	The Pico/San Vicente Station would require the acquisition of all the businesses located within the block bounded by Pico, San Vicente, Venice, and West Boulevards. In total, 9 commercial properties housing 8 businesses, the Eleanor Green Roberts Aquatic Center, and one church would be acquired. The acquisition of these commercial properties would displace an estimated 182 employees.	The commercial properties acquired would be the same as Alternative A except that the Eleanor Green Roberts Aquatic Center would not be purchased. The acquisition of these commercial properties would displace an estimated 147 employees.		The impacts would be the same as Alternative A.
	The loss of Builder's Discount and the Eleanor Green Roberts Aquatic Center, is of particular concern. These 2 businesses (one private and one public) provide unique services to the surrounding community, and would be difficult to relocate given their size and the relative scarcity of large, vacant properties within the area.	The loss of Builder's Discount would be the same as Alternative A; the Eleanor Green Roberts Aquatic Center would not be purchased.		The impacts would be the same as Alternative A.

Table S-1
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

No Project	Alternative A (Wilton/Arlington/ Pico)	Alternative B1 (Wilton/Arlington/ Venice, Lower Elevation)	Alternative B2 (Wilton/Arlington/ Venice, Higher Elevation)	Alternative C (Crenshaw/Pico)
21. Commercial Acquisitions and Employee Displacement Impacts (Cont.)				
	The relocation of the storm drain south of Pico Boulevard would require the acquisition of one commercial properties housing two businesses and displace 13 employees on the southeast corner of Pico and West Boulevards	This purchase would not be required for Alternative B.		The impacts would be the same as Alternative A.
	This purchase would not be required for Alternatives A and B.			The acquisition of one commercial building would be required to establish the construction staging area on the west side of Crenshaw Boulevard between Wilshire Boulevard and 8th Street. It is estimated that 5 employees would be displaced.
	These purchases would not be required for Alternatives A and B.			The relocation of the utilities near Crenshaw Boulevard would require the acquisition of 3 commercial buildings housing 5 businesses. It is estimated that 60 employees would be displaced.
	These purchases would not be required for Alternatives A and B.			Construction of vent shafts would require the acquisition of 1 commercial building housing 1 business. It is estimated that 18 employees would be displaced.
Mitigation Measures				
No mitigation is required.	Mitigation measures for Alternatives A, B1, B2, and C would be the same, and include:			
	The MTA's Public Affairs Team will establish a program to assist all displaced businesses that desire to relocate in the immediate area in locating comparable, decent, safe and sanitary replacement commercial space which is within a business' financial means before that business is displaced.			
	The MTA's Public Affairs Team will establish a program to assist all displaced employees who lose their job due to MTA's acquisition of commercial property with employment assistance.			

Table S-1
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

No Project	Alternative A (Wilton/Arlington/ Pico)	Alternative B1 (Wilton/Arlington/ Venice, Lower Elevation)	Alternative B2 (Wilton/Arlington/ Venice, Higher Elevation)	Alternative C (Crenshaw/Pico)
21. Commercial Acquisitions and Employee Displacement (Cont.)				
Unavoidable Significant Adverse Impacts				
No significant adverse impacts were identified.	The displaced Builder's Discount business may not be able to relocate within the project area due to the scarcity of large vacant properties. Because this business provides unique services to the community, its displacement may remain an unavoidable significant adverse impact if it cannot be relocated within the immediate area.			
	If the Eleanor Green Roberts Aquatic Center is not relocated within the Mid-City area it will result in an unavoidable significant adverse impact.	The Eleanor Green Roberts Aquatic Center will not be effected.		The same significant adverse impact as Alternative A.
22. Easements Required				
No easements would be required.	Approximately 79 easements would be required. 52 between the Wilshire/Western Station and the Olympic/Arlington Station, and 27 between the Olympic/Arlington Station and the Pico/San Vicente Station	Approximately 93 easements would be required. 52 between the Wilshire/ Western Station and the Olympic/Arlington Station, and 41 between the Olympic/Arlington Station and the Venice/San Vicente Station.		Approximately 52 easements would be required. 23 between the Wilshire/Western Station and the Olympic/Crenshaw Station, and 29 between the Olympic/Crenshaw Station and the Pico/San Vicente Station
Mitigation Measures				
No mitigation measures are required.				
Unavoidable Significant Adverse Impacts				
All alternatives would have a less than significant impact.				
SECTION 7.7 - BUSINESS DISRUPTION DURING CONSTRUCTION				
23. Business Disruption During Construction Impacts				
No impact was identified.	Construction activities would produce physical impacts near the Olympic Boulevard/Arlington Avenue intersection and just east of the Pico/San Vicente Boulevards intersection. Cut-and-cover	Construction activities would produce physical impacts near the Olympic Boulevard/Arlington Avenue intersection and just east of the Venice/San Vicente Boulevards intersection. Cut-and-cover construction methods would be implemented in Venice Boulevard between Victoria Avenue and the Venice/San Vicente Station, and in Crenshaw Boulevard (for 100 feet north and south of Venice Boulevard). The TBM could be removed from under		Businesses in close proximity to the cut-and-cover construction activities in Crenshaw Boulevard between 8th Street and a point approximately 1,100 feet south of Country Club Drive, in Pico Boulevard between

Table S-1
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

No Project	Alternative A (Wilton/Arlington/ Pico)	Alternative B1 (Wilton/Arlington/ Venice, Lower Elevation)	Alternative B2 (Wilton/Arlington/ Venice, Higher Elevation)	Alternative C (Crenshaw/Pico)
23. Business Disruption During Construction Impacts (Cont.)				
	construction methods would be implemented in Pico Boulevard between Victoria Avenue and the Pico/San Vicente Station, in Crenshaw Boulevard (for 100 feet north and south of Pico Boulevard), and within Queen Anne Place between Pico Boulevard and the Queen Anne Recreation Center. The TBM could be removed from under Wilshire Boulevard near Manhattan Place. Construction activities would disrupt businesses in close proximity to these locations. The potential construction impacts include: modified vehicular and pedestrian traffic patterns, increased noise and vibration, dust, and building settlement. Other physical impacts upon businesses along these corridors could include reduced visibility of signs or the business structures themselves, reduced accessibility, and reduced availability of parking.	Wilshire Boulevard near Manhattan Place. The potential construction disruption impacts are the same as those described for Alternative A.		Victoria Avenue and the Pico/San Vicente Station, and where the TBM could be removed from under Wilshire Boulevard near Manhattan Place would be disrupted. The potential construction disruption impacts are the same as those described for Alternative A.
	Establishing a construction staging area on the Pico/San Vicente Station property would have an effect on the businesses located along Pico Boulevard in close proximity to this site. In addition to the effects mentioned above, these businesses would be exposed to a number of large construction truck traffic trips that would be removing excavated	Establishing a construction staging area on the Venice/San Vicente Station property would have the same effect on the businesses located along Pico Boulevard in close proximity to this site as was described for Alternative A.		Establishing a construction staging area on the Pico/San Vicente Station property would have the same effect on the businesses located along Pico Boulevard in close proximity to this site as was described for Alternative A.

Table S-1
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

No Project	Alternative A (Wilton/Arlington/ Pico)	Alternative B1 (Wilton/Arlington/ Venice, Lower Elevation)	Alternative B2 (Wilton/Arlington/ Venice, Higher Elevation)	Alternative C (Crenshaw/Pico)
23. Business Disruption During Construction Impacts (Cont.)				
	material from the site. Seventeen commercial retail businesses on the north side of Pico Boulevard across from the site would be effected by construction activities including: increased truck traffic, modified vehicular and pedestrian traffic patterns, increased noise and vibration, and dust.			
	The cut-and-cover construction activity in Pico Boulevard between Victoria Avenue and West Boulevard would disrupt 27 commercial retail stores, 3 commercial manufacturing businesses, one motel/hotel, and 5 professional offices.	The cut-and-cover construction in Venice Boulevard between Victoria Avenue and the Venice/San Vicente Station could cause a minor disruption to the 11 businesses located to the east near the Venice/Crenshaw Boulevards intersection.		The cut-and-cover construction activity in Pico Boulevard between Victoria Avenue and West Boulevard would have the same disruptive effect on business as described for Alternative A.
	The cut-and cover construction activities required to relocate the sewer in Crenshaw Boulevard would disrupt those businesses within 100 feet of Pico Boulevard.	The cut-and cover construction activities required to relocate the sewer in Crenshaw Boulevard would disrupt those businesses within 100 feet of Venice Boulevard.		This impact would not occur for Alternative C.
	This impact would not occur for Alternatives A and B.			Cut-and-cover construction to relocate storm drains and sewer lines within the residential neighborhoods would require the acquisition and demolition of one business in the 1100 block of Crenshaw Boulevard.
	This impact would not occur for Alternatives A and B.			The cut-and-cover construction in Crenshaw Boulevard between 8th Street and a point approximately 1,100 feet south of Country Club

Table S-1
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

No Project	Alternative A (Wilton/Arlington/ Pico)	Alternative B1 (Wilton/Arlington/ Venice, Lower Elevation)	Alternative B2 (Wilton/Arlington/ Venice, Higher Elevation)	Alternative C (Crenshaw/Pico)
23. Business Disruption During Construction Impacts (Cont.)				
				Drive would disrupt the businesses located along this stretch of commercial properties. The types of effects that could occur are the same as those described for Alternative A. Seventy-nine businesses would be subject to business disruption associated with construction in this corridor (this number excludes existing businesses that would be displaced). The 79 businesses can be categorized as follows: 22 service-oriented; 14 wholesale/retail; 14 medical/acupuncture; 15 general office; 12 financial, insurance, or real estate; one convalescent hospital; and one motor inn.
Mitigation Measures				
No mitigation is required.	Mitigation measures for Alternatives A, B1, B2, and C would be the same, and include:			
	Prior to and during construction of the Mid-City Segment, the MTA will contact and interview individual businesses potentially effected by construction activities, and maintain appropriate records. Interviews with commercial establishments will provide MTA staff knowledge and understanding of how these businesses carry out their work, and will identify business usage, delivery, and shipping patterns and critical times of the day and year for business activities. Data gathered from these interviews will also assist the MTA as it works with the Los Angeles Department of Transportation and the Los Angeles Department of Public Works to develop the Worksite Traffic Control plans. Among other elements, these plans will identify alternate access routes to maintain critical business activities.			
	The MTA will establish a "Public Affairs Program" that will be responsible for implementing the following actions: • Convey construction information to the community in a timely manner so as to minimize the potential disruption to businesses. • Develop a process that will enable the community to "speak" to the MTA during construction that includes a specific mechanism for responding to community concerns in a timely manner. • All MTA responses to community concerns will be coordinated with the construction team.			

Table S-1
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

No Project	Alternative A (Wilton/Arlington/ Pico)	Alternative B1 (Wilton/Arlington/ Venice, Lower Elevation)	Alternative B2 (Wilton/Arlington/ Venice, Higher Elevation)	Alternative C (Crenshaw/Pico)
23. Business Disruption During Construction Mitigation Measures (Cont.)				
	Taking into consideration the potentially adverse impacts that construction impacts could have on businesses, the following mitigation measures will be implemented. The following measures will be tailored to meet specific construction site needs. These measures will be implemented through the use of construction contract drawings, specifications, and public affairs programs. The MTA will work with community residents, elected officials, local businesses, and community organizations to tailor the mitigation program to meet community needs in a Mid-City Business Disruption Mitigation Plan (BDMP) prepared by MTA staff prior to the commencement of construction activities. A copy of the Mid-City BDMP will be placed in the Mid-City Metro Information Field Office for public viewing. MTA will inform the public of its progress in implementing the measures identified through a quarterly program of auditing, monitoring, and reporting. A quarterly status report will be made available to the public. MTA shall appoint a staff person to work directly with the public to resolve construction-related problems.			
	The following mitigation measures are optional elements of the Mid-City BDMP. Their applicability and necessity for the Mid-City area will be reviewed prior to commencement of construction.			
	• **Construction Site and Field Offices -** During construction of the project, MTA staff will establish Metro information field office located along the Mid-City Segment. The field office, in conjunction with other MTA staff, will serve multiple purposes, including: ▸ respond/address community/business needs during the construction period, ▸ respond to complaints lodged by the public and construction claims, ▸ allow MTA to participate in local events in an effort to promote public awareness of the project, ▸ manage construction-related matters pertaining to the public, ▸ notify property owners, residences, and businesses of major construction activities, ▸ provide literature to the public and press, ▸ promote and provide presentations on the project via MTA's Speaker Bureau, ▸ respond to phone inquires, ▸ coordinate business outreach programs, ▸ schedule promotional displays, and ▸ participate in community committees.			
	The Metro information offices will be open various days of the work week for the duration of the construction period. A schedule will be developed before construction begins, and included in the Mid-City Business Disruption Plan and reported in the quarterly Mitigation Measures Status Report provided to the FTA.			
	• **Information Line -** An information and voice mail telephone line will be available to provide community members and businesses the opportunity to express their views regarding construction. Calls received will be reviewed by MTA staff and will, as appropriate, be forwarded to the necessary party for action (e.g., utility company, fire department, Resident Engineer in charge of construction operations). Information available from the telephone line should include current project schedule, dates for upcoming community meetings, notice of construction impacts, individual problem solving, construction complaints, and general information.			
	• **Advertisements -** The MTA will provide trilingual English/Spanish/Korean advertisements for local print and radio for affected businesses. In addition, a trilingual English/Spanish/Korean construction update will be available regularly throughout the community at least once a quarter.			

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No Project	Alternative A (Wilton/Arlington/ Pico)	Alternative B1 (Wilton/Arlington/ Venice, Lower Elevation)	Alternative B2 (Wilton/Arlington/ Venice, Higher Elevation)	Alternative C (Crenshaw/Pico)
23. Business Disruption During Construction Mitigation Measures (Cont.)				
	• **Business Support Programs** - The MTA will provide affected businesses with the support needed to implement promotions designed to help maintain their customary level of business.			
	• **Signage** - The MTA will work with establishments affected by the Mid-City Segment construction activities. Appropriate signage will be developed and displayed by the MTA to direct both pedestrian and vehicular traffic to businesses via alternate routes.			
	• **Traffic Management Plans** - Traffic management plans to maintain access to all businesses will be prepared for all project construction areas.			
	In addition, daily cleaning of work areas will be performed by contractors for the duration of the construction period.			
	Provisions will be contained in construction contracts to require the maintenance of driveway access to businesses to the extent feasible.			
	• **Deck Level** - To the extent feasible, the Mid-City Segment, concrete decking along the cut-and-cover segments will be installed flush with the existing street or sidewalk levels.			
	• **Sidewalk Design and Maintenance During Construction** - Wherever feasible, sidewalks will be maintained at their current width during construction. Where a sidewalk must be temporarily narrowed during construction (e.g., deck installation), it will be restored to its current width during the majority of the construction period. Each sidewalk design will be of good quality and be approved by the MTA Resident Engineer prior to construction. Handicapped access will be maintained during construction where feasible.			
	• **Construction Site Fencing During Construction** - Construction site fencing will be of good quality, capable of supporting the accidental application of the weight of an adult without collapse or major deformation. Fence designs or samples will be submitted to the MTA Resident Engineer for approval prior to installation. Where major boulevards must be fenced, business owners will be offered the opportunity to request covered walkways in lieu of chain-link fencing. Where covered walkways or solid surface fences are installed, a program will be implemented to allow for art work (e.g., by local students) on the surface(s). Where used, chain link fences will have slats that will be maintained in clean repair.			
	• **Construction Site Maintenance** - The construction site will be maintained in a neat manner, with all trash collected daily, all wood and pipes stacked neatly, and all small parts stored in closed containers.			
	• **Construction Impact Loan Program** - The current MTA construction impact loan program will be reviewed by the MTA to determine its possible application and effectiveness for the local businesses that would be affected by Mid-City Segment construction.			
	• **Temporary Relocation/Subsidy** - It may be necessary to temporarily relocate immediately affected owners and occupants of businesses or provide a rent subsidy if, for example, access to the business could not be maintained or the business could not be operated in a normal manner. These options will be explored by MTA staff if the need arises.			
Unavoidable Significant Adverse Impacts				
No significant adverse impacts have been identified.	**Alternatives A and B** - On the northwest corner of Olympic Boulevard and Wilton Place the normal business operations of the Korean TV Station could be effected.			

Table S-1
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

No Project	Alternative A (Wilton/Arlington/ Pico)	Alternative B1 (Wilton/Arlington/ Venice, Lower Elevation)	Alternative B2 (Wilton/Arlington/ Venice, Higher Elevation)	Alternative C (Crenshaw/Pico)
23. Business Disruption During Construction Unavoidable Significant Adverse Impacts (Cont.)				
	Alternatives A and C - Cut-and-cover construction during the installation and removal of the concrete street decking on Pico Boulevard between Victoria Avenue and West Boulevard would affect the normal business operations of the businesses along this commercial strip.			
	Alternative C - Cut-and-cover construction (during the installation and removal of the concrete street decking) on Crenshaw Boulevard from 8th Street to a point 1,100 feet south of Country Club Drive would affect the normal business operations of the businesses along this commercial strip.			
	Alternatives A, B, and C - Construction activities on the construction staging area south of Pico Boulevard between San Vicente and West Boulevards would affect the businesses on the north side of the street along this commercial strip. The potential removal of the TBM from within Wilshire Boulevard immediately west of Western Avenue would also affect the businesses along this commercial strip for approximately two months.			
SECTION 7.8 - COMMUNITIES AND COMMUNITY FACILITIES				
24. Construction Impacts - Community Facilities				
No impact has been identified.	Construction activities for the Olympic/Arlington Station would cause environmental impacts that could disrupt or otherwise limit a nearby community facility from being able to effectively provide its services to the community. A Buddhist Temple is located on Wilton Place immediately north of Olympic Boulevard and the Olympic/Arlington Station construction area. The twin tunnels for would pass directly under this property. The primary concerns with this community facility are the potential impacts that construction noise and vibration could have on their Sunday worship.	The same impact as Alternative A.		Construction activities for the Olympic/Crenshaw Station and the cut-and-cover construction activities within the Crenshaw Boulevard right-of-way between 8th Street and a point 1,100 feet south of Country Club Drive would cause environmental impacts that could disrupt or otherwise limit those community facilities located along this segment of Crenshaw Boulevard from being able to effectively provide their services to the community. The community facilities include several churches and one convalescent hospital. The effects would be the same as those described for Alternative A.
	The Eleanor Green Roberts Aquatic Center would be demolished to make room for the Pico/San Vicente Station.	The Eleanor Green Roberts Aquatic Center would not be demolished.		The same impact as Alternative A.

Table S-1
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

No Project	Alternative A (Wilton/Arlington/ Pico)	Alternative B1 (Wilton/Arlington/ Venice, Lower Elevation)	Alternative B2 (Wilton/Arlington/ Venice, Higher Elevation)	Alternative C (Crenshaw/Pico)
24. Construction Impacts - Community Facilities (Cont.)				
	The Korean Youth Center, located at 680 South Wilton Place, and Wilton Place School, located at 745 South Wilton, are immediately adjacent to the street where the twin tunnels would be located. Tunnel boring activities and other related construction impacts, such as settlement and ground-borne noise and vibration, could disrupt or otherwise limit these community facilities from being able to effectively provide their services to the community.			This effect would not occur with this alternative.
	Construction activities to relocate a major storm drain under Queen Anne Place near the Queen Anne Elementary School and the Queen Anne Recreation Center would cause environmental impacts that could disrupt or otherwise limit these two community facilities from being able to effectively provide their services to the community. The effects would be the same as those described above for the Wilton Place School.	This effect would not occur with this alternative.		The same impact as Alternative A.
Mitigation Measures				
No mitigation would be required.	**Alternatives A and B -** As is standard practice, noise and vibration analyses will be conducted by MTA for the specific land uses along the alignment during final design, and mitigation measures developed for construction and operation. These measures are provided in Section 7.11 (Noise and Vibration).			
	Alternatives A and C - In association with the City of Los Angeles Parks and Recreation Department, the MTA shall provide for the construction of a new pool facility to serve the area prior to the removal of the existing Eleanor Green Roberts Aquatic Center facility. (Also see Section 7.20 (Section 4(f) Evaluation.)			
	Alternatives A, B, and C - The physical effects of the project, such as settlement, noise and vibration, and dust are mitigated in the following respective sections of this document Sections 7.15, 7.11, and 7.12.			
Unavoidable Significant Adverse Impacts				
25. Operation and Maintenance Impacts - Community Facilities				
No impacts were identified.	The existing Buddhist Temple could potentially be impacted by noise and vibration.			This effect would not occur with this alternative.

Table S-1
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No Project	Alternative A (Wilton/Arlington/ Pico)	Alternative B1 (Wilton/Arlington/ Venice, Lower Elevation)	Alternative B2 (Wilton/Arlington/ Venice, Higher Elevation)	Alternative C (Crenshaw/Pico)
25. Operation and Maintenance Impacts - Community Facilities (Cont.)				
	There would be some positive impacts associated with the development of the Red Line because it would provide improved access for transit dependent persons to community/regional facilities. These potential impacts are discussed in greater detain in Section 7.5 (Demographics/Accessibility for Transit/ Environmental Justice).			
Mitigation Measures				
No mitigation is required.	**Alternatives A and B -** As is standard practice, noise and vibration analyses will be conducted by MTA for the specific land uses along the alignment during final design, and mitigation measures developed for construction and operation. These measures are provided in Section 7.11 (Noise and Vibration).			
Unavoidable Significant Adverse Impacts				
All alternatives would have a less than significant impact.				
SECTION 7.9 - SAFETY AND SECURITY				
26. Construction Impacts - Metro Rail Safety and Security Considerations				
No impacts were identified.	Occasionally, construction activities within the public right-of-way would cause traffic to be rerouted around construction barricades to other lanes or onto adjacent streets thereby increasing the potential for accidents involving pedestrians (including students traveling to and from schools), bicycles, and vehicles.			
	Construction cut-and-cover activities and staging areas would be highly visible and could increase the potential for property crimes such as theft or vandalism of project construction vehicles, equipment, and materials.			
Mitigation Measures				
No mitigation would be required.	Design criteria will focus primarily on the protection of people and property, include planning for adequate emergency exits, stand-by electrical power supplies, appropriate alarming systems and emergency communication systems. Station design will include closed circuit television monitors, a public address system, and emergency telephones in the communications system for use by patrons to contact central control.			
	Station design will utilize low combustion or non-combustion materials to the maximum extent possible. Where low combustion materials are used they will be low-smoke and low-toxic fume producing.			
	Stations will have fire sprinklers and "wet" stand pipes, smoke/gas detectors and alarm systems, adequate tunnel and station ventilation systems, and adequate exits and other emergency provisions such as safety walks and tunnel cross-passages.			
	MTA will implement emergency response procedures for operating personnel and local agencies. Extensive periodic training will also occur.			
Unavoidable Significant Adverse Impacts				
All alternatives would have a less than significant impact.				

Table S-1
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No Project	Alternative A (Wilton/Arlington/ Pico)	Alternative B1 (Wilton/Arlington/ Venice, Lower Elevation)	Alternative B2 (Wilton/Arlington/ Venice, Higher Elevation)	Alternative C (Crenshaw/Pico)
27. Operation and Maintenance Impacts - Metro Rail Safety and Security Considerations				
No impacts were identified.	The proposed station areas have the potential to result in conflicts between bus, automobile, pedestrian, and traffic if not designed properly.			
	A potential exists for fire and other accidents/medical emergencies to occur on the trains or the station areas.			
	Security concerns associated with the project include: incidents, offenses, crimes, and related events at station entrances and within the stations, on board trains, at ancillary facilities, and at adjacent properties.			
	During the operation of the Metro Red Line stations a potential exists for criminal activity and vandalism to occur within their areas of operation.			
	During the operation of the Metro Red Line a potential exists for criminal activity and vandalism to occur on the trains.			
Mitigation Measures				
No mitigation would be required.	The stations will be designed to avoid conflicts between bus, automobile, pedestrian, and street traffic. Clear, comprehensible signs will be used and high levels of visibility would be maintained between pedestrians and vehicle drivers.			
	Station architectural design will include provisions such as those for adequate lighting, walking surfaces constructed of non-slip materials, safe pedestrian access to station entrances, and fail safe train control apparatus.			
	The stations will be designed to enhance security. The station interiors will be open and clearly lit. Clear sight lines would be emphasized. Low ceilings, excessive numbers of columns, and darkened areas will be avoided. Designs will seek to eliminate any blind spots or potential hiding places for criminals. Passages leading to the street will receive specific attention. Stair passages will generally be kept straight and will be sufficiently wide so that their entire lengths can be readily seen, thus reducing unanticipated (and unobserved) conflicts with other users. Transit police will patrol the stations.			
	Intercoms will be placed in each train car passenger compartment so that patrons can use them to report disturbances to the train operator. The train operator will then alert transit security people to board and/or otherwise intercept any suspects at the next station. Transit police will be assigned to routinely patrol the trains.			
	MTA will allocate security funds as appropriate to ensure adequate security and passenger protection.			
Unavoidable Significant Adverse Impacts				
All alternatives would have a less than significant impact.				
SECTION 7.10 - AESTHETICS				
28. Construction Impacts - Aesthetics				
No significant aesthetic impacts would occur.	During construction residential areas would have direct views of construction activities and storage areas.			The impact would be the same as Alternatives A and B except to a greater degree because of the addition construction staging area

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No Project	Alternative A (Wilton/Arlington/ Pico)	Alternative B1 (Wilton/Arlington/ Venice, Lower Elevation)	Alternative B2 (Wilton/Arlington/ Venice, Higher Elevation)	Alternative C (Crenshaw/Pico)
28. Construction Impacts - Aesthetics (Cont.)				
				along Crenshaw Boulevard south of Wilshire Boulevard. The Olympic/ Crenshaw Station would require cut-and-cover construction methods for relocating storm drains and sewer lines within the residential neighborhoods on both sides of Crenshaw Boulevard. These utility relocations would require the removal of swaths of residential units that would create a visual incompatibility with the existing residential character of these neighborhoods. Where the residential units would be removed the visual incompatibility would continue until such time as a new residential structure would be constructed.
	The construction areas would be lit during evening and nighttime hours for security and work areas.			
Mitigation Measures				
No mitigation would be required.	Mitigation measures for Alternatives A, B1, B2, and C would be the same, and include:			
	To ensure visual compatibility between the construction sites, staging areas, and adjacent residential neighborhoods, the following mitigation measures will be implemented: a. The construction sites, including staging areas, will be secured along the perimeter with appropriate fencing. This fencing will be designed to act as shielding to restrict direct ground level views into the working area. b. No billboards will be posted or replaced during construction and operation.			
	During construction, all exterior on-site light fixtures will be directed towards the site and properly shielded. All exterior lights will be restricted to the lowest height that is required for proper performance.			
Unavoidable Significant Adverse Impacts				
All alternatives would have a less than significant impact.				

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<tr><td colspan="5">29. Operation and Maintenance Impacts - Aesthetics</td></tr>
<tr><td rowspan="4">No impact has been identified.</td><td colspan="4">During operation the station areas would be lit with security and landscape lighting during evening and nighttime hours. A potential exists for this light to spill onto adjacent residential properties.</td></tr>
<tr><td colspan="4">Properties utilized for construction staging areas or were cleared for utility relocations could be left vacant after construction activities are complete and could become eyesores in the community if not properly maintained.</td></tr>
<tr><td colspan="4">A potential exists that the stations and entrance plazas would not be visual compatibility with adjacent residential areas.</td></tr>
<tr><td colspan="3">Alternatives A and B do not require mid-tunnel vent structures that are aboveground.</td><td>Ventilation structures could be out of sync with the surrounding visual character of the community and they could be targets for graffiti and vandalism.</td></tr>
<tr><td colspan="5">Mitigation Measures</td></tr>
<tr><td rowspan="7">No mitigation would be required.</td><td colspan="4">Mitigation measures for Alternatives A, B1, B2, and C would be the same, and include:</td></tr>
<tr><td colspan="4">All exterior lighting associated with station design and operation will be in accord with standards recommended by the Illuminating Engineering Society of North America. This will ensure the residential neighborhoods around the stations are protected from spill light.</td></tr>
<tr><td colspan="4">All vacant properties will be maintained (including temporary landscaping) and cleared of unsightly and overgrown vegetation. Security fences will incorporate materials that do not attract graffiti and will be easily maintained if graffiti were to occur.</td></tr>
<tr><td colspan="4">All excess vacant property will be sold or jointly developed as soon as possible after construction activities have been completed.</td></tr>
<tr><td colspan="4">Each station site will be well-designed so as to integrate the transit facility with the surrounding community. Station design will follow the established standards contained in the Community Plan and/or Specific Plan in which a facility is located. All station plans will be subject to review and approval of the designated Design Review Board. Standards for review will include the following criteria: landscaping plans (including on and offsite and rooftop landscaping), and parking structure design standards and architectural treatments (to ensure compatibility with the surrounding community character).</td></tr>
<tr><td colspan="4">The design of the 8- to 10-foot walls constructed for development of the Olympic/Arlington and Olympic/Crenshaw stations will be included as part of station design plans submitted for review by the Design Review Board. MTA will maintain these wall and landscape surrounding ground area to minimize the occurrence of litter and graffiti.</td></tr>
<tr><td colspan="3">This mitigation measure is not required for Alternatives A and B.</td><td>The ventilation structures will be secured and screened from view to minimize visibility and discourage graffiti and vandalism.</td></tr>
</table>

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No Project	Alternative A (Wilton/Arlington/ Pico)	Alternative B1 (Wilton/Arlington/ Venice, Lower Elevation)	Alternative B2 (Wilton/Arlington/ Venice, Higher Elevation)	Alternative C (Crenshaw/Pico)
29. Operation and Maintenance - Aesthetics (Cont.)				
Unavoidable Significant Adverse Impacts				
All alternatives would have a less than significant impact.				
SECTION 7.11 - NOISE AND VIBRATION				
30. Construction Noise Impacts				
No significant construction noise impacts would occur.	Four existing buildings would be demolished on the southwest corner of Olympic Boulevard and Arlington Avenue to create a construction staging area for the Olympic/Arlington Station. The construction staging and the area within Arlington Avenue where the station box would be constructed would have residential dwelling units within its 150-foot noise "envelope." In the absence of mitigation, a temporary significant noise impact would occur.			Demolition of existing commercial buildings to create two construction staging areas that would eventually become station plazas for the Olympic/Crenshaw Station and subsequent station construction would impact the residences within its 150-foot noise "envelope." In the absence of mitigation, a temporary significant noise impact would occur.
	Cut-and-cover within Pico Boulevard between Victoria Avenue and West Boulevard would create noise impacts. The nearest residential uses are somewhat screened by the commercial buildings that front Pico Boulevard. Unless highly noisy construction activities are conducted at night, temporary noise impacts from the Pico Boulevard cut-and-cover component of this alternative would be less than significant.	The close proximity of residential development to Venice Boulevard, in both areas of proposed cut-and-cover construction and for the proposed station, would potentially impact a number of residents, particularly for any nighttime construction activities. Cut-and-cover tunnel excavation has a 315-foot noise impact zone at night, and 150 feet by day. A substantial number of the first-tier residential structures that are closest to Venice Boulevard are within the zone of potential noise impact. Substantial nighttime construction activity would have a potentially significant impact.		Cut-and-cover within Crenshaw Boulevard between 8th Street and a point 1,100 feet south of Country Club Drive and within Pico Boulevard between Victoria Avenue and the Pico/San Vicente Station site would create noise impacts. Since the construction sites would be in close proximity to residential areas east and west of Crenshaw Boulevard and north and south of Pico Boulevard, construction without noise abatement measures would cause a significant impact.

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<tr><td colspan="5">30. Construction Noise Impacts (Cont.)</td></tr>
<tr><td rowspan="3"></td><td>Cut-and-cover construction activities to relocate a storm drain within Queen Anne Place would create noise impacts at Queen Anne Recreation Center, the Queen Anne Elementary School, and the residential units along this street.</td><td colspan="2">This effect would not occur with Alternative B.</td><td>Same impact as Alternative A.</td></tr>
<tr><td colspan="4">Installation of grouting over the tunnels from the surface would create short-term significant noise impacts. Holes would be drilled from the surface and grout would be pumped through pipes into the ground to reduce the potential for settlement to occur along the path of the twin tunnels. It is not known where grouting from the surface would be required along the tunnel alignments.</td></tr>
<tr><td colspan="3">This effect would not occur with Alternatives A and B.</td><td>Cut-and-cover construction activities to relocate storm drains and sewer lines would create noise impacts in the right-of-way, with the demolition of the 15 single-family, one multi-family building, and 3 commercial buildings. The construction activities associated with the relocation of utility lines for this alternative is expected to last about two years. The construction of new buildings would occur over an unknown period of time.</td></tr>
<tr><td colspan="5">Mitigation Measures</td></tr>
<tr><td rowspan="2">No mitigation is required.</td><td colspan="4">Mitigation measures for Alternatives A, B1, B2, and C would be the same, and include:</td></tr>
<tr><td colspan="4">MTA will include in all construction contract documents noise and vibration performance standards. MTA will use noise pollution control specifications developed for its construction contracts consistent with the newest FTA requirements. Noise specifications will include noise limits for individual pieces of equipment, and/or thresholds for acceptable levels at nearby noise-sensitive land uses. MTA vibration specifications will specify limits for damage and/or annoyance at sensitive land uses. The MTA specifications will require the contractor to monitor noise and vibration levels to demonstrate compliance with the specifications.</td></tr>
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<tr><td colspan="5">30. Construction Noise Mitigation Measures (Cont.)</td></tr>
<tr><td rowspan="7"></td><td colspan="4">As part of the preparation for construction, during final design of the LPA, the MTA will conduct a survey of sensitive structures. It is recommended that vibration monitoring equipment be installed near sensitive uses to ensure that during construction activity, vibration remains well below the 95 VdB threshold for damage to fragile historic buildings. MTA will fit sensitive structures with geotechnical instrumentation and maintain monitoring during construction. If required, grouting will also be used to minimize the potential for soil settlement around the tunneling. (Same as mitigation measure #4 in section 7-16.)</td></tr>
<tr><td colspan="3">The MTA will purchase two additional structures immediately south of the five structures that will be purchased for the construction staging area for the Olympic/Arlington Station; one on Arlington Avenue and one on Westchester Place. This structures will be retained for use as construction offices. Retaining these two structures will provide a buffer zone between the construction staging area and the residential neighborhood to the south. The two structures in the buffer zone will help dampen noise from the construction staging area.</td><td>This mitigation does not apply to Alternative C.</td></tr>
<tr><td colspan="4">Within all construction staging areas, noisy equipment will be kept as far as possible from sensitive land uses by MTA's contractors. It may be possible to arrange the site to provide acoustic shielding from noisier activities at nearby sensitive land uses. Truck routes to and from the site will be arranged by the contractor to minimize passing near sensitive land uses.</td></tr>
<tr><td colspan="4">MTA's contractors will carefully schedule noisy activities to minimize noise and vibration impacts. Wherever feasible, noisier activities will be performed during daytime hours in residential areas, while avoiding daytime activities near schools or day care centers. The current City of Los Angeles noise ordinance has severe limits on nighttime construction noise. The effect of these limits are to basically prohibit nighttime construction near residential areas. Certain Metro Rail activities are exempt from the ordinance. Such exemption notwithstanding, time limits will be imposed on the contractors as environmental clearance conditions regardless of whether they are not required by ordinance.</td></tr>
<tr><td colspan="4">Depending upon the configuration of the site and location of nearby sensitive land uses, if possible MTA will require contractors to provide temporary noise barriers to reduce construction noise levels. MTA's contractors will provide enclosures for stationary equipment (such as compressors or generators) if they generate noise complaints. MTA's contractors will provide noise barriers around any of the construction sites where they are needed to avoid intrusive noise in residential communities. In particular, contractors will provide a noise barrier to separate the Olympic/Arlington or Olympic/Crenshaw construction and staging areas from the nearest residences. With primarily one-story receiver locations, temporary barrier heights of 10 feet may be adequate. Multiple-story receiver heights may require taller barriers. MTA's contractors will provide finalized barrier location/design based on required knowledge of specific locations for cranes and other noise sources to be developed in subsequent construction planning.</td></tr>
<tr><td colspan="4">An MTA community liaison staff person will be used to help inform residents of the schedule and extent of planned construction activities and can help work with community members to find the least intrusive times for certain construction activities. Warning residents of unavoidably noisy activities can help them plan around the intrusion.</td></tr>
<tr><td colspan="4">In the event that construction-related noise or vibration levels cannot be sufficiently reduced, it may be necessary for the MTA to give the affected residents and businesses the option of being temporarily relocated until intrusive construction activities have been completed. Treatments to individual homes, such as double-pane windows, would also be considered on a case-by-case basis, if warranted.</td></tr>
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SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

No Project	Alternative A (Wilton/Arlington/ Pico)	Alternative B1 (Wilton/Arlington/ Venice, Lower Elevation)	Alternative B2 (Wilton/Arlington/ Venice, Higher Elevation)	Alternative C (Crenshaw/Pico)
30. Construction Noise (Cont.)				
Unavoidable Significant Adverse Impacts				
All alternatives would have a less than significant impact.				
31. Construction Vibration Impacts				
No significant construction vibration impacts would occur.	Activities that are expected to cause the highest levels of construction vibration include soldier pile placement, vibratory compaction, tunnel excavation, and operation of "muck" trains to remove excavated material. Vibration may also result during horizonal drilling for tie-back placement.			
	Vibration from tunneling and operation of "muck" trains is unlikely to exceed the threshold for building damage, but may be perceptible or annoying to building occupants up to approximately 100 feet from the working portions of the tunnel alignment.			
Mitigation Measures				
No mitigation is required.	Muck hauling vibration impacts can be mitigated by modification to the temporary rail-bed, or by limiting hauling hours to less sensitive time periods.			
Unavoidable Significant Adverse Impacts				
All alternatives would have a less than significant impact.				
32. Operational Noise Impacts - Trains and Plazas				
No significant impacts would occur.	This alternative has no aboveground track components, as such, there are no significant noise impacts. Noise would be associated with human activity at the station entrance plazas.	The train would be visible for 500 feet from when it emerges from the tunnel until it comes to a stop at mid-platform. Train noise impacts are less than significant relative to the adopted FTA Guidelines. Brake squeal and horn honking, however, would be audible at the nearest homes from inbound trains, and it would be disturbing to sleeping people. Noise would also be associated with human activity at the station entrance plazas.		Same impact as Alternative A.
Mitigation Measures				
No mitigation would be required.		A 6-foot solid wall along the southern track boundary extending from Station 496+50 (immediately west of West Boulevard) to Station 500+00 (the beginning of the Venice/San Vicente Station) (as shown on Figure 2-4) will be required to screen wheel noise from both the inbound stopping and possibly outbound accelerating trains from the nearest residences with back or side yard exposure to Venice Boulevard and the Red Line track.		No mitigation would be required.
No mitigation would be required.		The MTA will set the train's horn to sound at the minimum safe level while in the vicinity of the Venice/San Vicente Station and/or explore other options for alerting passengers that a train is approaching.		No mitigation would be required.

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No Project	Alternative A (Wilton/Arlington/ Pico)	Alternative B1 (Wilton/Arlington/ Venice, Lower Elevation)	Alternative B2 (Wilton/Arlington/ Venice, Higher Elevation)	Alternative C (Crenshaw/Pico)
32. Mitigation Measures - Trains and Plazas				
No mitigation would be required.		MTA will monitor existing noise levels immediately before construction begins, and quarterly thereafter to ensure train noise exposure remains below significance threshold levels. The MTA will implement additional mitigation as required to meet standards.		No mitigation would be required.
	An 8-10 foot concrete/masonry wall, along with sound absorbing landscaping will be constructed to separate the homes abutting the south side of the Olympic/Arlington Station entrances from traffic noise and plaza activities.			This mitigation measure is not required for Alternative C.
	MTA will require the engineer/designer to include a wall 8-10 feet high adjacent to newly exposed one-story unit receivers . For a two-story receiver, a wall height of 15 feet will be necessary to protect upstairs noise-sensitive uses.			
	This mitigation measure is not required for Alternatives A and B.			In those areas where there are multi-story buildings adjacent to the Olympic/Crenshaw Station, MTA will require that physical barriers be erected for noise protection that are high enough to break the source-receiver line of sight. An 8-10 foot concrete/masonry wall, along with sound absorbing landscaping will be constructed to separate the homes abutting the Olympic/ Crenshaw Station from traffic noise and plaza activities.
Unavoidable Significant Adverse Impacts				
All alternatives would have a less than significant impact.				
33. Operational Noise Impacts - Ground-borne Noise and Vibration				
No significant impacts would occur.	Except for one possible recording studio on Pico Boulevard, all vibration and/or ground-borne noise impacts occur between the Wilshire/Western and Olympic/Arlington Stations. The tunnel alignment is directly under approximately 52 properties with a tunnel depth of slightly less than 30 feet. The location where mitigation is required to eliminate potential ground-borne vibration impacts for Alternative A would be between Ingraham Street and Olympic Boulevard, or a 3,000 foot segment. The tunnels would go directly under a TV station located on the northwest corner of Olympic Boulevard and Wilton Place. The tunnels are also adjacent to several buildings that house acupuncture businesses.			All vibration and/or ground-borne noise impacts occur between the Wilshire/Western and Olympic/ Crenshaw Stations. The tunnel alignment is directly under approximately 23 properties with a tunnel depth of slightly less than 50 feet.

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<tr><td colspan="5">33. Operational Noise Impacts - Ground-borne Noise and Vibration (Cont.)</td></tr>
<tr><td></td><td>This impact is not associated with this alternative.</td><td colspan="2">Due to the residential uses that abut Venice Boulevard between Victoria Avenue and West Boulevard noise and vibration impacts could occur.</td><td>This impact is not associated with this alternative.</td></tr>
<tr><td colspan="5">Mitigation Measures</td></tr>
<tr><td rowspan="6">No mitigation would be required.</td><td colspan="4">Relatively standard mitigation measures will be sufficient to eliminate impacts of only a few dB. It is recommended that MTA require resiliently supported ties or plinth pads and bonded rubber pads be used in the areas where mitigation is required. MTA staff will supply to the engineers/designers measurement data from operating sections of the Red Line for use in refining the vibration control requirements and optimize the mitigation design. With proper selection of the vibration control measures, it is possible to eliminate the projected vibration impacts.</td></tr>
<tr><td colspan="4">The resiliently supported tie system consists of concrete ties supported by rubber pads. The rails are fastened directly to the concrete ties using standard rail clips. Underground rails are also supported on concrete plinth pads which run parallel to the rail. The metal fastener which connects the rail to the plinth pad incorporates bonded rubber pads to dampen noise and vibration. Existing measurements data suggests that resiliently supported ties can be very effective in reducing low-frequency vibration in the 15 to 40 Hz range. This makes them particularly appropriate for transit systems with vibration problems in the 20 to 30 Hz range. With appropriate stiffness pads, this approach will be able to eliminate potential impacts of the project except for the TV studio and possibly the acupuncture offices.</td></tr>
<tr><td colspan="3">The television studio has several mitigation options, including the following in order of complexity and cost:
• Use of a floating slab trackbed for the segment underneath the studio.
• Construction of a noise- and vibration-isolated studio through a box-within-a-box construction.
• Determination that existing truck traffic on Olympic Boulevard already causes vibration to exceed 65 VdB (re: 10^{-6} in/sec) or ground-borne noise to exceed 25 VdB, thus reducing or eliminating the need for mitigation.
• Relocation of the facility.</td><td>This mitigation is not required for Alternative C.</td></tr>
<tr><td colspan="3">Acupuncture has been treated in other Red Line studies as a normal medical facility not affected by vibration levels which humans can generally not even feel (i.e., $\leq$70 VdB). The baseline vibration level may already exceed this threshold during individual events.</td><td>This mitigation is not required for Alternative C.</td></tr>
<tr><td colspan="4">Baseline vibration monitoring will be conducted by the MTA prior to preliminary design, and the necessity to mitigate to undetectable vibration levels will be established before mitigation for these uses is finalized.</td></tr>
<tr><td>MTA staff will determine if a recording studio exists at 4365 Pico Boulevard, based on the name of "Intersound Productions" on the door. If it is a recording studio, MTA will include mitigation measures, such as those described for the TV station.</td><td colspan="3">This mitigation is not required for Alternatives B and C.</td></tr>
</table>

Table S-1
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

No Project	Alternative A (Wilton/Arlington/ Pico)	Alternative B1 (Wilton/Arlington/ Venice, Lower Elevation)	Alternative B2 (Wilton/Arlington/ Venice, Higher Elevation)	Alternative C (Crenshaw/Pico)
33. Mitigation Measures - Ground-borne Noise and Vibration (Cont.)				
	This mitigation is not required for this alternative.	MTA will require the engineer/designer to include track modifications within the cut-and-cover segment between Civil Station 480+00 (Victoria Avenue) to 495+00 (West Boulevard) through the use of resiliently supported ties or plinth pads and bonded rubber pads to reduce impacts to less than significant levels.		This mitigation is not required for this alternative.
	The MTA will conduct a survey of sensitive structures, and install vibration monitoring equipment near sensitive uses to ensure that during construction activity, vibration remains well below the 95 dBV threshold for damage to fragile historic buildings. MTA will fit sensitive structures with geotechnical instrumentation and maintain monitoring during construction.			
Unavoidable Significant Adverse Impacts				
All alternatives would have a less than significant impact.				
34. Operational Noise Impacts -Ventilation Structures				
No impact has been identified.	Mid-tunnel ventilation structures would not be required for Alternatives A and B.			Two mid-tunnel ventilation structures would be constructed; one at Wilshire/Norton and one at Pico/Victoria.
Mitigation Measures				
No mitigation is required.	No mitigation is required for Alternatives A and B.			MTA will require that ventilation equipment and structures be tested and certified to meet MTA noise performance standards.
	No mitigation is required for Alternatives A and B.			MTA will require the engineer/ designer to include track modifications from Civil Station 395+50 (Norton Avenue/Wilshire Boulevard) to 408+50 (Crenshaw Boulevard/8th Street) and from Station 445+00 (Crenshaw Boulevard) to 460+00 (Pico Boulevard) to reduce operational vibration impacts to less than significant levels.

Table S-1
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

No Project	Alternative A (Wilton/Arlington/ Pico)	Alternative B1 (Wilton/Arlington/ Venice, Lower Elevation)	Alternative B2 (Wilton/Arlington/ Venice, Higher Elevation)	Alternative C (Crenshaw/Pico)
34. Ventilation Structures (Cont.)				
Unavoidable Significant Adverse Impacts				
All alternatives would have a less than significant impact.				
SECTION 7.12 - AIR QUALITY/ODOR				
35. Construction Impacts - Air Quality				
No impacts have been identified.	Impacts for Alternatives A, B1, B2, and C would be the same, and include:			
	Air quality impacts from the project would result from utility relocation, site clearing, tunneling, and cut-and-cover construction activities. Emissions would derive from on-site equipment exhaust, off-site truck emissions, and from fugitive dust generated during demolition and surface disturbance.			
	Criteria air pollutant emissions from utility relocation would exceed SCAQMD's applicable significance threshold.			
	Utility relocations would last approximately one-year for Alternatives A and B, and two years for Alternative C. While on a daily basis, the amount of air pollutants emitted by each alternative would be approximately the same, Alternative C would produce twice the total amount because of their extended construction schedule.			
	Air pollutants would be emitted during demolition and removal of existing structures and use of powered construction equipment at the construction sites. Sources of off-site emissions of air pollutants from site clearing would be similar to those from utility relocation. Criteria air pollutant emissions from site clearing/ preparation would individually exceed SCAQMD significance thresholds for CO and NO_x.			
	The proposed project would generate air pollutant emissions from: excavation of the access shaft; excavation of soils from the tunnel; and stockpiling of excavated soils at the construction staging areas. Off-site emissions of air pollutants would result from transport of excavated materials from the construction sites and construction worker commute trips. Criteria air pollutant emissions from tunneling would exceed SCAQMD's applicable significance threshold for all five pollutants analyzed.			
	Air pollutants would be emitted during: installation of soldier piles; deck placement over the street; installation of tunnel support and excavation of the tunnel interior; construction of line segments and stations; and street restoration. Off-site emissions of air pollutants would result from transport of excavated materials from the construction sites and construction worker commute trips. Criteria air pollutant emissions from surface-based excavation activities would exceed SCAQMD's applicable significance threshold.			
	H_2S gas emissions would not exceed the State public health threshold for H_2S of 0.03 ppm as a one-hour average. Odors within the immediate construction environment could intermittently exceed the odor detection threshold. Possible public exposure would be confined to the Olympic/Crenshaw Station (Alternative C) or Pico/San Vicente Station (Alternatives A and C) areas. H_2S was not detected in the borings immediately around the Olympic/Arlington Station (Alternatives A and B).			
	Projected PM_{10} emissions with one, two, or three EPB TBMs in operation would be below SCAQMD thresholds. Projected PM_{10} emissions with one, two, or three EPB TBMs in operation would be below SCAQMD thresholds. If bentonite loss is significant or if none can be recycled, then SCAQMD daily emissions threshold criteria would be exceeded by 44 pounds if two TBMs were in operation. This would be a significant impact unless mitigated.			

Table S-1
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

No Project	Alternative A (Wilton/Arlington/ Pico)	Alternative B1 (Wilton/Arlington/ Venice, Lower Elevation)	Alternative B2 (Wilton/Arlington/ Venice, Higher Elevation)	Alternative C (Crenshaw/Pico)
35. Construction Impacts - Air Quality (Cont.)				
Mitigation Measures				
No mitigation would be required.	Mitigation measures for Alternatives A, B1, B2, and C would be the same, and include:			
	The MTA will require their contractors to schedule materials deliveries during off-peak traffic periods to avoid contributing to peak-hour traffic congestion. This measure would reduce emissions of criteria air pollutants by an unknown, but minor, amount.			
	The MTA will require their contractors to use electricity provided by temporary power poles, rather than operate diesel- or gasoline-powered generators at construction sites. This measure would reduce project emissions of ROC from this equipment by about 99 percent, of CO by about 98 percent, of NO_X by about 97 percent, and of PM_{10} by about 98 percent.			
	The MTA will require their contractors to use electric, methane, natural gas, or propane-powered construction equipment and vehicles, rather than gasoline- or diesel-powered equipment or vehicles, where feasible. The contractor will provide a list of equipment and vehicles to MTA that will use non-gasoline or diesel fuel. This measure would reduce project emissions of ROC from this equipment by about 54 percent, of CO by about 25 percent, and of PM_{10} by about 95 percent. This measure would increase emissions of NO_X by about 29 percent.			
	The MTA will require their contractors to use temporary traffic control (e.g., flag persons) where construction traffic accessing construction sites or construction staging sites have the potential to create substantial traffic congestion or delays, where stipulated in the Worksite Traffic Control Plan (see Section 7.2, Traffic). This measure would reduce emissions of ROC by an unknown, but minor, amount.			
	The MTA will require their contractors to prohibit trucks and equipment at construction sites and at construction staging sites from idling for more than two minutes when not in active use, when it is safe to do so. This measure would reduce emissions of ROC by an unknown, but minor, amount.			
	The MTA will require their contractors to suspend use of all construction equipment or construction vehicles during second-stage smog alerts. This measure would reduce emissions of ROC by an unknown, but minor, amount.			
	The MTA will require their contractors to maintain construction vehicles and equipment in proper tune, and retard diesel engine timing. This measure would reduce NO_x emissions from construction vehicles and equipment by about five percent.			
	The MTA will require their contractors to comply with SCAQMD's Rule 403, as revised, and choose from the following measures, among others, to control particulates: a. Contractors to suspend excavation, grading, or other particulate-generating activities when winds (peak 10-second gusts) exceed 25 miles per hour. This measure would reduce the amount of dust generated by wind erosion by an unknown, but substantial, amount. b. Contractors to cover dirt and sediment haul trucks. This measure would reduce the amount of dust generated by wind erosion by an unknown, but substantial, amount. c. Contractors to wet down active construction sites at least two times per day, and more if necessary. This measure would increase the average moisture content of loose soils being worked or disturbed on construction sites, reducing fugitive dust emissions from soil disturbance by about 50 percent. d. Contractors to apply approved chemical soil stabilizers according to manufacturers' specifications to all inactive construction sites (previously graded areas inactive for four days or more). This measure would reduce the amount of dust generated by wind erosion by about 30-65 percent.			

Table S-1
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

No Project	Alternative A (Wilton/Arlington/ Pico)	Alternative B1 (Wilton/Arlington/ Venice, Lower Elevation)	Alternative B2 (Wilton/Arlington/ Venice, Higher Elevation)	Alternative C (Crenshaw/Pico)
35. Construction Mitigation Measures - Air Quality (Cont.)				
	e. Contractors to replace ground cover in disturbed areas as quickly as possible. This measure would reduce the amount of dust generated by wind erosion by about 15-49 percent. f. Contractors to enclose, cover, water twice daily, or apply approved soil binders according to manufacturers' specifications to exposed materials piles (i.e., sand, gravel, dirt). Excavated material will be transported off-site as soon as possible and properly disposed of. The height and bulk of excavated material will be controlled to minimize neighborhood impacts to the satisfaction of the MTA and the City of Los Angeles. This measure would reduce the amount of dust generated by wind erosion by about 30-74 percent.			
	Contractors will sweep streets at the end of each work day, if visible soil material is carried over to adjacent roads. This measure would reduce PM_{10} emissions from loose soils by about 25-60 percent.			
	Contractors will operate wheel washers in wet weather where vehicles enter and exit unpaved areas of construction sites onto paved roads. This measure would reduce PM_{10} emissions from vehicle wheels by about 40-70 percent.			
	Contractors will apply water twice daily, or approved chemical soil stabilizers according to manufacturers' specifications, to all unpaved parking or staging sites, or unpaved road surfaces. This measure would reduce the amount of dust generated by wind erosion by about 45-85 percent.			
	Contractors will maintain traffic speeds on all unpaved roads at 15 miles per hour or less. This measure would reduce PM_{10} emissions from off-road vehicle travel by about 40-70 percent.			
	Contractors will pave construction roads that have a traffic volume of more than 50 daily trips by construction equipment, or more than 150 total daily trips for all vehicles. This measure would reduce PM_{10} emissions from off-road vehicle travel by 100 percent.			
	Contractors will pave construction access roads at least 100 feet onto the site from the main road. This measure would reduce PM_{10} emissions from off-road vehicle travel by 100 percent.			
	The MTA will consult with local homeowners associations regarding additional measures beyond the requirements of Rule 403 to reduce construction-related particulate emissions at the station excavation sites (source) as well as effects in their neighborhoods (receptor) during the period of construction.			
	The MTA will require their contractors to transport powder bentonite clay in bulk using pneumatic or enclosed trucks.			
	The MTA will require their contractors to use enclosed handling and storage; unload bentonite clay pneumatically or using enclosed conveyors and chutes, and enclose any stored or stock piled bentonite in structures or silo equipped with fabric filters.			
	The MTA will require their contractors to use a slurry batch plant with a mixer that is equipped with a pneumatic loader and a fabric filter or a mixer in an enclosed structure equipped with fabric filters at all ventilation openings.			
Unavoidable Significant Adverse Impacts				
No significant adverse impacts were identified.	Although implementing the mitigation measures described above would reduce air quality impacts of CO, ROC, NO_X, and SO_X, project related emissions would remain an unavoidable significant adverse impact of constructing any of the "build" alternatives. Implementation of the mitigation measures described above would reduce PM_{10} impacts to a level of less than significant.			

Table S-1
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

No Project	Alternative A (Wilton/Arlington/ Pico)	Alternative B1 (Wilton/Arlington/ Venice, Lower Elevation)	Alternative B2 (Wilton/Arlington/ Venice, Higher Elevation)	Alternative C (Crenshaw/Pico)
36. Operation and Maintenance Impacts - Air Quality				
Under the No Project Alternative, air quality benefits associated with reduced automobile travel would not be realized.	Impacts for Alternatives A, B1, B2, and C would be the same, and include: On-site stationary sources of air pollutants associated with the project would include: station operations; water treatment systems; vent shafts; park-and-ride, kiss-and-ride, and bus transfer facilities. Off-site stationary sources include regional power plants. Both criteria air pollutants and trace amounts of TACs would be emitted by the various elements of the project. For Alternatives A and C only, vented air would contain essentially the same concentrations of H_2S as found in the tunnels and stations, so the project could occasionally generate odors in the vicinity of the vent structures (odors would be rapidly diluted in the ambient air to concentrations below the odor threshold). Because H_2S concentrations resulting from the air ventilation shafts would not be detectable for sustained periods and occasional odors from H_2S are not expected to occur regularly over a long period of time, significant odor impacts are not expected. Project implementation would reduce regional vehicular emissions by diverting traffic from low-occupancy automobiles to mass transit. A significant regional pollution savings would accompany the proposed extension at least in the first ten years of project existence. The microscale air quality impacts from project implementation would exceed the California one-hour standard of 20 ppm at 12 intersections with the less stringent federal standard of 35 ppm exceeded at two locations. The eight-hour state and federal CO standard would be exceeded for existing conditions at every intersection analyzed. For future (2020) conditions, the maximum theoretical one-hour CO exposure would be less than even the eight-hour standard by a considerable margin of safety. However, the proposed project's contribution (from project related station ingress/egress traffic) is no more than 0.3-0.4 ppm. Implementing any of the proposed "build" alternatives would have a minimal (non-significant) effect on microscale air quality impacts. The Metro Red Line Mid-City project is found to be consistent with the AQMP because: ▸ It is consistent with SCAG's Regional Comprehensive Plan which relates to air quality and provides some of the input assumptions to the AQMP, and it would not cause exceedances of the assumptions in the AQMP for 2010; ▸ The air quality impacts of the project were analyzed as recommended in SCAQMD's 1993 Air Quality Handbook using standard methods, assumptions, and significance criteria; ▸ Mass transit is specifically mentioned in the AQMP as a "Transportation Control Measure;" and, ▸ With the incorporation of mitigation measures the project would not increase the frequency or severity of existing air quality violations, cause or contribute to new violations, or delay timely attainment of air quality standards or the interim reductions specified in the AQMP.			
Mitigation Measures				
No mitigation is required.	(Alternatives A and C). The MTA will ensure project design features will be implemented to reduce potential effects of H_2S on sensitive receptors including: • Standby or intermittent air injection will be installed prior to construction at station areas and sections of the tunnels where higher H_2S readings have historically been found. • Probe holes also will be tested ahead of tunnels; where probes indicate higher gas levels than predicted, additional measures will be taken such as activation of gas extraction, slowing construction advance, or increasing ventilation rates.			

Table S-1
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

No Project	Alternative A (Wilton/Arlington/ Pico)	Alternative B1 (Wilton/Arlington/ Venice, Lower Elevation)	Alternative B2 (Wilton/Arlington/ Venice, Higher Elevation)	Alternative C (Crenshaw/Pico)
36. Operation and Maintenance - Air Quality				
Unavoidable Significant Adverse Impacts				
All alternatives would have a less than significant impact.				
SECTION 7.13 - UTILITIES				
37. Construction Impacts - Utility Relocation and Replacement				
No impacts have been identified.	Storm drains within the public right-of-way would be relocated in Pico Boulevard between Victoria and Mullen Avenues; in Queen Anne Place between Queen Anne Recreation Center and Pico Boulevard. A sewer would be replaced in Crenshaw Boulevard for a distance of 100 feet north and south of Pico Boulevard. The construction activities could block access to commercial and residential properties.	Storm drains within the public right-of-way would be relocated in Venice Boulevard between Victoria Avenue and La Fayette Road. A sewer would be replaced in Crenshaw Boulevard for a distance of 100 feet north and south of Venice Boulevard. The construction activities could block access to commercial and residential properties.		Alternative C would relocate the same storm drains described in Alternative A. In addition, storm drains within the public right-of-way would be relocated in 9th Street between Crenshaw Boulevard and 5th Avenue; in Victoria Avenue between 9th Street and Country Club Drive; in Olympic Boulevard between Crenshaw Boulevard and Victoria Avenue; and in Bronson Avenue between Country Club Drive and a point north of 12th Street. Sewers within the public right-of-way would be relocated in 9th Street between Crenshaw Boulevard and Norton Avenue; in Victoria Avenue between 9th Street and Olympic Boulevard; in Olympic Boulevard mid-block between Pico Boulevard and Country Club Drive; and in Bronson Avenue between Country Club Drive and a point north of 12th Street. The construction activities could block access to commercial and residential properties.

Table S-1
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

No Project	Alternative A (Wilton/Arlington/ Pico)	Alternative B1 (Wilton/Arlington/ Venice, Lower Elevation)	Alternative B2 (Wilton/Arlington/ Venice, Higher Elevation)	Alternative C (Crenshaw/Pico)
37. Construction Impacts - Utility Relocation and Replacement (Cont.)				
	Storm drain relocation would require the acquisition of one commercial property located on the southeast corner of Pico and West Boulevards.	Utility relocations would not require the acquisition of private property.		Alternative C would acquire the same private property described in Alternative A. In addition, 15 single-family residences, 1 multi-family building, and 2 more commercial properties would be acquired to relocate storm drains and sewers. These private property acquisitions would occur mid-block south of 9th Street between 5th Avenue and a point west of 3rd Avenue; between Crenshaw Boulevard and Victoria Avenue at 9th Street; and between Bronson and Victoria Avenues mid-block between Country Club Drive and 12th Street.
Mitigation Measures				
No mitigation would be required.	Mitigation measures for Alternatives A, B1, B2, and C would be the same, and include:			
	The MTA or their contractor will provide 30-day prior notice, including the anticipated dates and times of street/access closures, to all effected properties that front onto or otherwise have access from the streets that will be temporarily closed or otherwise impeded by construction activities. The MTA or their contractor will restore access to all properties during non-working hours.			
	Early in the construction design phase MTA or their contractor will coordinate with utility providers. Additionally, affected utility providers will be consulted during the construction phases to minimize interruption in service. Detailed construction plans will be given to utility providers by MTA or their contractor for review and comment. These plans, along with drawings of existing surface and subsurface utilities or structures, will be reviewed with the utility companies to ensure that all potential impacts of subway construction have been identified. Necessary arrangements such as early relocation or utility abandonment will be made. MTA will execute a cooperative agreement with each utility provider prior to construction.			
	After input from the utility providers is obtained and prior to excavation, MTA or their contractor will arrange an investigation of the condition of utilities and will test for existing leaks. All valves and shut-offs will be located and tested; fire hydrants, fire lines, and water utilities larger than a few inches in diameter will be checked for leaks; and for large lines, connections at buildings will be exposed and tested for leaks. Depending on the likelihood of leaks, MTA or their contractor will require development of a sampling program to uncover and analyze potential breaks in service pipes. If required, a sampling program will include digging test pits along the alignment to expose and investigate existing conditions of water service for several buildings in each block			

Table S-1
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

No Project	Alternative A (Wilton/Arlington/ Pico)	Alternative B1 (Wilton/Arlington/ Venice, Lower Elevation)	Alternative B2 (Wilton/Arlington/ Venice, Higher Elevation)	Alternative C (Crenshaw/Pico)
37. Mitigation Measures - Utility Relocation and Replacement (Cont.)				
	along the alignment. If faulty water services were discovered, repair and exploration of services in additional buildings could be required. The MTA or their contractor will be responsible for scheduling all utility company work and for requiring an inspector to document all work performed by utility companies, the MTA or the MTA contractors.			
	As excavation begins, MTA or their contractor will continue to monitor utility conditions. Any leaks that were repaired prior to tunneling will be monitored and the location and condition of utilities ahead of tunneling will be verified. MTA or their contractor will use soundings to detect leaks and an inspector will be required to document the status of leaks on a regular basis.			
	The intent of the above measures is to lessen the potential for utility disruption during construction. However, because the risk of utility disruption cannot be completely eliminated, MTA has developed an emergency response plan to assure a quick response and repair of a disrupted utility line. The core of the MTA's emergency response plan is to work closely with utility companies and to keep them informed of MTA construction activities. If a leak or other infrastructure problems arise at an MTA construction site, the MTA or their contractors will notify the effected utility as soon as possible (no longer than one-hour).			
Unavoidable Significant Adverse Impacts				
All alternatives would have a less than significant impact.				
SECTION 7.14 - SURFACE WATER QUALITY				
38. Construction Impacts - Surface Water Quality and Storm Water Runoff				
No impacts to surface water quality have been identified.	At all construction sites surface water would be collected, treated on-site, and discharged to the local storm drain system or the City's sewer system. Contaminants typically found in storm water runoff include runoff from roads, industrial land uses, and landscaped areas.			The potential impacts to surface water quality under Alternative C would be the same as Alternatives A and B only they would occur in greater quantities since there would be significantly more cut-and-cover construction for Alternative C along Crenshaw Boulevard.
The No Project Alternative would result in an impact to storm water drainage capacity. The existing storm water drainage system serving the project area is antiquated and does not provide sufficient storm water drainage capacity. Each of the "build"	Each of the "build" alternatives would require the abandonment of several existing storm drains and the construction of new storm drains (the locations of which are described above in Section 7.13). The new storm drains would have a larger receiving capacity for the collection of storm water runoff than the existing storm drains. No significant impacts to local and regional storm drain systems are anticipated during project construction. Drainage patterns would not be substantially altered; drainage in the project area would continue to drain into Ballona Creek upon the completion of the new storm drains. No disruption in storm water service capacity would occur.			

Table S-1
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

No Project	Alternative A (Wilton/Arlington/ Pico)	Alternative B1 (Wilton/Arlington/ Venice, Lower Elevation)	Alternative B2 (Wilton/Arlington/ Venice, Higher Elevation)	Alternative C (Crenshaw/Pico)
38. Construction Impacts - Surface Water Quality and Storm Water Runoff (Cont.)				
alternatives would replace antiquated storm water drainage systems, and construct new storm drains resulting in new infrastructure with increased queuing capacity to more effectively accommodate local storm water drainage.				
Mitigation Measures				
Implementation of any of the "build" alternatives would mitigate the no project impact.	Mitigation measures for Alternatives A, B1, B2, and C would be the same, and include:			
	MTA or their contractor will be required to obtain an NPDES Construction Permit for the proposed project. The NPDES permit requires development and implementation of a Storm Water Pollution and Prevention Plan (SWPPP) emphasizing storm water Best Management Practices (BMPs). The SWPPP has two major objectives: (1) to help identify the sources of pollution that affect the quality of industrial storm water discharges; and (2) to describe and ensure the implementation of practices to reduce pollutants in industrial storm water discharges.			
	Required elements of the SWPPP are: (1) source identification; (2) practices to reduce pollutants; (3) an assessment of potential pollution sources; (4) a materials inventory; (5) a preventative maintenance program; (6) spill prevention and response procedures; (7) general storm water management practices; (8) employee training; (9) record keeping; (10) elimination of unpermitted non-storm water discharges to the industrial storm water system; (11) methods of onsite storage and disposal of significant materials; (12) sediment and erosion prevention; and (13) a topographic map of each job site extending one-quarter mile beyond the property boundaries.			
	The following construction BMPs will be implemented by MTA or their contractor to control sediment and other construction-related pollutants: (1) provide additional catch basin and storm drain channel cleaning when and where needed; (2) increase street sweeping in areas where needed; (3) create or augment a program to eliminate the improper disposal of litter into the street or area where runoff may carry these pollutants to the storm drain system; (4) recycle applicable construction materials (e.g., glass, plastic) to prevent their improper disposal into the storm drain system; (5) properly dispose of construction-related hazardous wastes to prevent their improper disposal into the storm drain system; and (6) properly use and conserve water to minimize runoff from construction areas.			
	Water quality will be monitored by MTA or their contractor to assess the effectiveness of the BMPs and, as part of the NPDES Permit requirements, monthly monitoring reports will be submitted to the RWQCB. With implementation of the BMPs stated above, potential water quality impacts would be less than significant.			
Unavoidable Significant Adverse Impacts				
All alternatives would have a less than significant impact.				

Table S-1
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

No Project	Alternative A (Wilton/Arlington/ Pico)	Alternative B1 (Wilton/Arlington/ Venice, Lower Elevation)	Alternative B2 (Wilton/Arlington/ Venice, Higher Elevation)	Alternative C (Crenshaw/Pico)
SECTION 7.15 - GEOLOGY AND SUBSURFACE CONDITIONS				
39. Construction Impacts - Geological and Subsurface Conditions				
No impacts were identified.	Boring the twin tunnels could potentially cause settlement and related effects to existing structures. However, one of the most important engineering features of the proposed project would be the use of earth pressure balance tunnel boring machines (EPB TBMs). These EPB TBMs are state-of-the-art in that they represent the most advanced engineering technology for reducing settlement impacts during tunnel construction. These EPB TBMs have been successfully used in other subway projects internationally and have typically resulted in less settlement impacts when compared to other types of excavation methods. By using this advanced and proven technology (in association with compaction grouting), the settlement impacts of the proposed project would be less than significant.			
	The design features of the project would render the potential effects of subsurface hydrogen sulfide gas on project construction to a less than significant level.			
	The design features of the project would render the potential effects of subsurface methane gas on project construction to a less than significant level.			
	The construction features of the project would render the effects of dissolved hydrogen sulfide gas in groundwater to a level less than significant.			
	The design features of the project would render the effects of tar on project construction to a level less than significant.			
	Soils excavated during tunneling and cut-and-cover construction activities generally would consist of clean, unconsolidated silt, sand, and gravel, which are non-hazardous soils. Some of the excavated soils, however, may be contaminated with hydrocarbons or other chemicals which may have leached into the soils from underground storage tanks or other sources along the project alignment. Excavated soils contaminated from these stations may be classified as hazardous. These materials would be removed and safely disposed at a Class I hazardous waste disposal facility.			
	The excavated muck piles on the construction staging site could be a significant effect of the project if they are allowed to get too high.			
Mitigation Measures				
No mitigation would be required.	During cut-and cover activities, mitigation measures will be implemented by MTA or their contractor to reduce the potential for settlement, and address the stability of excavated areas and surrounding properties. These measures will include installation of soldier piles and a timber or shotcrete lagging sheeting system, or other appropriate excavation and support systems procedures. In addition, adjacent buildings will be monitored for movement.			
	During tunnel excavation, mitigation measures to be implemented by MTA or their contractor will include the use of chemical or compaction grouting, appropriate dewatering system design installation and operational procedures, and use of a pressure face tunnel boring machine. Compaction grouting involves injecting a sand, water and cement mixture into the ground under pressure. Chemical grouting involves injecting a chemical, such as sodium silicate, into the ground and allowing it to migrate and fill the pore openings and thereby increase the stability of the soil. The pressure face tunnel boring machine will keep a pressure on the face and install precast concrete segments to support the surrounding earth. These precast bolted gasketed segments form the structural lining system. Ground settlement will be monitored during tunneling. An action level amount of ground settlement (e.g., 1 inch or a maximum angular distortion on a structure) that will trigger remedial action will be specified in construction contracts. Remedial action to be taken if the action level is realized will include measures such as grouting ahead of the tunnel and/or adjusting the face pressure on the TBM.			

Table S-1
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

No Project	Alternative A (Wilton/Arlington/ Pico)	Alternative B1 (Wilton/Arlington/ Venice, Lower Elevation)	Alternative B2 (Wilton/Arlington/ Venice, Higher Elevation)	Alternative C (Crenshaw/Pico)
39. Mitigation Measures - Geological and Subsurface Conditions				
	Pressure face tunnel boring machines (TBMs) will be utilized for the Mid-City Segment by MTA or their contractor. The principal technological advantage of the pressure face TBM is a reduction in surface settlement, in comparison with other types of excavation methods. This is due to the fact that the slurry shield TBMs are extremely well adapted to changing soil conditions. The slurry shield TBMs stabilize the soil by continually injecting a wet slurry into it, while the earth pressure balance shield creates stable soil conditions by keeping the forward section of the machine under constant earth or fluid pressure.			
	Hydrogen sulfide gas impacts will be mitigated by MTA or their contractor by pre-treating such as pre-venting by air injection and vapor extraction where necessary prior to construction and by using the pressure face TBM during construction. To reduce the impact of methane gas during construction, a system consisting of monitoring, ventilation, spark control and gas control will be implemented. The tunnels will be engineered to minimize gas intrusion during operations. Specifically, the pressure face TBMs in combination with gasketed tunnel liners will minimize water and gas intrusion. Gas detector sensors will be installed within the tunnels and stations, and will be designed to immediately inform MTA personnel of any unsafe concentrations of gas. Leak repair teams will be immediately dispatched to repair any cracks or leaks.			
	Groundwater contaminated with hydrocarbons could be drawn into the project area as a result of dewatering activities associated with the project. Fixed and mobile treatment units will be used by MTA or their contractor to treat groundwater from dewatering, water from seepage into the tunnels and station excavations, stormwater and construction water. The treatment systems will typically consist of the following operations: • oxidation of dissolved hydrogen sulfide; • flocculation (separation of suspended solids during water treatment by chemical creation of clumps or flocs) and sedimentation of colloidal (finely divided solids which will not settle but may be removed by coagulation or biochemical action or membrane filter) and suspended material; • Activated carbon adsorption for removal of dissolved organic compounds; • Removal of oil and grease from water generated from construction activities; • Use of an equalization tank for stormwater to dampen peak flows.			
	Any hazardous materials encountered during project construction would be safely removed, temporarily stored, and properly transported to a hazardous waste treatment and/or a Class I designated hazardous waste disposal facility.			
	The overall height of excavated dirt piles stored on a construction staging area will be managed by the MTA contractor in accordance with the direction provided by the MTA construction manager.			
Unavoidable Significant Adverse Impacts				
All alternatives would have a less than significant impact.				
40. Operation and Maintenance Impacts - Geological and Subsurface Conditions				
No impacts were identified.	The major operational impact of the geology to the project would be the potential for damage from local and regional earthquakes. Effects of earthquakes that could damage project facilities include fault movement, ground rupture, ground shaking, liquefaction, and seismic settlement.			

Table S-1
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

No Project	Alternative A (Wilton/Arlington/ Pico)	Alternative B1 (Wilton/Arlington/ Venice, Lower Elevation)	Alternative B2 (Wilton/Arlington/ Venice, Higher Elevation)	Alternative C (Crenshaw/Pico)
40. Operation and Maintenance Impacts - Geological and Subsurface Conditions (Cont.)				
	Seismic shaking is a significant geologic hazard to the project. The character and strength of ground shaking in the Los Angeles Basin is difficult to predict. However, it is likely that the project area would experience strong ground shaking during the life of the project. Depending on the frequency and amplitude of the ground motions, the tunnels and stations could be subject to failure if not designed to withstand significant seismic shaking. The potential for failure would be increased if liquefaction or settlement occurred in combination with the shaking.			
	Seepage of hydrogen sulfide gas into the tunnel due to a breach caused by a large earthquake would not expose patrons to dangerous levels of hydrogen sulfide gas after the implementation of control measures (United States Department of Transportation, et al., 1996).			
	Methane gas concentrations would be kept low during operation of the project through the use of appropriate tunnel ventilation.			
Mitigation Measures				
	The project's tunnels will be designed by MTA or their contractor in accordance with current MTA design criteria, incorporating the most recent information on potential seismic shaking, seismically induced liquefaction, and hydrogen sulfide gas in the study area. Such design features will include pre-cast reinforced concrete tunnel segments. Emergency systems will provide any additional ventilation required until passengers are evacuated in the event of an earthquake. Upon incorporation of this and other design features, the effects of seismic shaking on the project will be less than significant.			
	To prevent infiltration of both gas and water to the project facilities, MTA or their contractor will add gaskets to tunnel liners, will strengthen conduit seals and collars and caulking of seams and cracks, and will continuously vent the air in tunnels and stations. Gas detector sensors will be provided within the tunnels and stations, rather than using a central analyzer. Leak repair teams will be organized prior to any event and will have procedures in place to immediately respond to gas alerts or alarms. Air sampling tubes will be strategically located in the stations and tunnels to help identify potential sources of gas intrusion. Air samples from the project facilities will be collected and tested at regular intervals to monitor flammable and toxic gases before harmful or explosive concentrations could accumulate. MTA personnel will be trained to appropriately recognize and respond to conditions involving gas infiltration.			
Unavoidable Significant Adverse Impacts				
All alternatives would have a less than significant impact.				
SECTION 7.16 - HISTORIC RESOURCES				
41. Construction Impacts - Historic Buildings				
No impacts were identified.	Vibration from construction activities, particularly during tunnel boring, could effect historic or potentially historic buildings along the alignment.			
	Subsidence caused by construction activities, particularly during tunnel boring, could effect the following historic or potentially historic structures: Tuthill Apt. Bldg. Lopez Quadruplex	Subsidence caused by construction activities, particularly during tunnel boring, could effect the following historic or potentially historic structures: Tuthill Apt. Bldg. Lopez Quadruplex West Blvd. Overcrossing		Subsidence caused by construction activities, particularly during tunnel boring, could effect the following historic or potentially historic structures: 5 houses in Oxford Square Craftsman District

Table S-1
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

No Project	Alternative A (Wilton/Arlington/ Pico)	Alternative B1 (Wilton/Arlington/ Venice, Lower Elevation)	Alternative B2 (Wilton/Arlington/ Venice, Higher Elevation)	Alternative C (Crenshaw/Pico)
41. Construction Impacts - Historic Buildings (Cont.)				
	Kim Residence Westchester Apt. Bldg.			William Grant Still residence
	The Olympic/Arlington Station entrance could cause a visual impact to the following historical structure: Zucker Residence	Same impact as Alternative A.		The Olympic/Crenshaw Station entrance could cause a visual impact to the following historical structures: Windsor Village
Mitigation Measures				
	The MOA will be modified commensurate with impacts documented for this segment of the project. The revised MOA will be monitored for compliance through the Mitigation Measures Status Report (MMSR) submitted quarterly to the FTA. SHPO will also be sent a copy of the MMSR quarterly.			
	MTA will develop project design guidelines to ensure compatibility of station plans with adjacent historic resources. In accordance with the conditions of the MOA, every attempt will be made by the MTA to ensure that new construction will be compatible with the remaining historic properties in terms of scale, massing, color and materials employed and station entrances will be designed for compatibility with the existing urban environment.			
	Subsidence represents the most serious potential impact to historic resources, particularly in the cases of structures standing directly over tunnel alignments. Construction plans call for measures to minimize ground settling and it should be possible to reduce settling impacts to a low level of significance by careful planning and engineering. The MTA will require their tunnel contractor to utilize an EPB TBM (closed faced) to minimize subsidence.			
	As part of the preparation for construction, during final design of the LPA, the MTA will conduct a survey of sensitive structures. It is recommended that vibration monitoring equipment be installed near sensitive uses to ensure that during construction activity, vibration remains well below the 95 VdB threshold for damage to fragile historic buildings. MTA will fit sensitive structures with geotechnical instrumentation and maintain monitoring during construction. If deemed necessary, the MTA will install vibration absorbent track or floating slab track in areas adjacent to the sensitive structures. If required, grouting will also be used to minimize the potential for soil settlement around the tunneling. (Same as mitigation measure #2 in section 7-11.)			
	The MTA will require their contractor to use caution when shoring adjacent to the West Boulevard Overcrossing to ensure that contiguous earth does not subside beyond limits that would damage the bridge.			
	MTA staff will work with the Los Angeles City Planning Department staff to encourage owners of historic buildings near station sites to retain the buildings, as situations arise.			
	The MTA will be sensitive to historic structures that are located near to entrance plazas. The design of the entrance plazas will consider how visible surface structures are placed and designed, and colors will be selected to minimize visual impacts to historic structures.			
Unavoidable Significant Adverse Impacts				
Minimal subsidence may represent an unavoidable adverse impact to historic structures along all of the"build" alternative alignments. Such subsidence could result in cracks in foundations, walls, etc.. No other unavoidable significant adverse impacts to historical resources are anticipated as a result of the proposed project.				

Table S-1
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

No Project	Alternative A (Wilton/Arlington/ Pico)	Alternative B1 (Wilton/Arlington/ Venice, Lower Elevation)	Alternative B2 (Wilton/Arlington/ Venice, Higher Elevation)	Alternative C (Crenshaw/Pico)
SECTION 7.17 - ARCHAEOLOGICAL RESOURCES				
42. Construction Impacts - Archaeological Resources				
No impacts were identified.	No archaeological resources which could be adversely affected by any of the "build" project alternatives have been identified.			
	The chances of historic archaeological resources being present in the area around the former site of the Venice Power House are good.			
	The chances of encountering archaeological resources in all other locations are regarded as remote.			
Mitigation Measures				
No mitigation would be required.	Any earthmoving activities at the site of the Pacific Electric Railway's Vineyard Power House will be monitored by a qualified professional archaeologist. The area will be tested by a qualified archaeologist prior to any grading activities. The purpose of the test will be to determine whether a significant archaeological deposit is present at the location.			
	MTA has a standard construction monitoring plan for archaeological resources with general procedures to be followed during excavation. The detailed monitoring requirements are found in "Scope of Work for Archaeological and Paleontological Monitoring" (SOWAPM) and in MTA's Standard Contract Specification Section 01170 (Archaeological and Paleontological Coordination). The plan describes specific authorities and responsibilities of the project archaeologist (PA), resident engineer (RE), and construction manager; specific procedures for the protection of archaeological resources prior to evaluation and consultation; specific procedures for temporary work stoppage; and specific procedures for archaeological documentation and report preparation. Construction Contract Specification 01170 details the process of archaeological resources monitoring and the procedures for protecting and evaluating unanticipated archaeological resources.			
	The procedures outlined in *Treatment Plan for Potential Cultural Resources Within Proposed Metro Rail Subway Station Locations in Metropolitan Los Angeles, California* (SCRTD 1985) will be followed. This plan established general procedures to be followed in protecting archaeological resources encountered during construction, specific procedures for the protection of archaeological resources anticipated at individual station areas, and procedures for handling the discovery of unanticipated resources.			
	In general, the procedure to be followed during excavation monitoring is straightforward and involves the construction contractor, the RE, MTA personnel, and the PA (construction monitors). Excavation activities affecting archaeological resources will cease upon the discovery of such resources and the RE will immediately notify the PA. The PA has authority to temporarily halt work in the immediate area to determine whether the discovery is significant. Specific responsibilities for work stoppage can be found in Section 2.3.3 of the SOWAPM. Following notification, the monitors will take actions to evaluate the discovery and provide guidance to the RE on any actions that should be taken to provide appropriate management and treatment research, planning and testing, monitoring, research design, data recovery, reports and records, and curation. For those resources determined to be eligible by the PA, a mitigation plan will be developed in conjunction with SHPO.			
	Mitigation archaeological personnel will meet with appropriate project personnel at each excavation site to instruct project personnel on their responsibilities and the procedures to be implemented if archaeological remains are encountered.			
Unavoidable Significant Adverse Impacts				
All alternatives would have a less than significant impact.				

Table S-1 SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES				
No Project	Alternative A (Wilton/Arlington/ Pico)	Alternative B1 (Wilton/Arlington/ Venice, Lower Elevation)	Alternative B2 (Wilton/Arlington/ Venice, Higher Elevation)	Alternative C (Crenshaw/Pico)
SECTION 7.18 - PALEONTOLOGICAL RESOURCES				
43. Construction Impacts - Paleontological Resources				
No impacts were identified.	The disturbance and loss of fossil remains and fossil sites in older alluvium potentially resulting from tunneling and cut-and-cover activities could be a significant impact of project construction. Impacts associated with cut-and-cover excavation could be mitigated to a level of insignificance by the recovery of fossil remains and associated site data from the excavation sites. The older alluvium in the project area would have a moderate to high potential for yielding a variety of remains representing diverse taxa. Based on other paleontological finds in the area, it is expected that the following paleontological resources could be encountered during project excavation activities: marine invertebrates; land plants; insects; freshwater mollusks; reptiles; birds; and mammals.			
Mitigation Measures				
Mitigation would not be required.	Prior to any earth-moving activity in the corridor, a paleontological resource management consulting firm will be retained by MTA to manage a paleontological resource impact mitigation program. The firm will have experience in conducting similar monitoring and resource recovery programs in areas underlain by rock units containing large and small marine and land mammal remains. Such programs will have included the excavation and proper removal of large mammal specimens and the collection and processing of large samples of fossiliferous rock for smaller vertebrate fossil remains and smaller marine megainvertebrate remains.			
	The mitigation program manager will prepare a treatment plan with a discovery clause to allow for the recovery and processing of an unusually large or productive fossil occurrence that cannot be recovered or processed without diverting program personnel from their own tasks. The treatment plan will specify the procedures and, if possible, the costs associated with rock sample recovery and processing or large specimen recovery and preparation; and identification, curation, and storage of such an occurrence. The discovery clause will specify when and how the treatment plan would be initiated.			
	Mitigation program personnel will meet with appropriate project personnel at each excavation site to instruct project personnel on their responsibilities and the procedures to be implemented if fossil remains are encountered.			
	A paleontological construction monitor will inspect cut-and-cover excavation at each excavation site once excavation has encountered the alluvium below the artificial fill.			
	Monitoring will consist of inspecting excavations and spoils for larger fossil remains. If larger fossil remains are encountered by excavation, the monitor will have the authority to temporarily divert excavation around the fossil site until the remains have been examined, evaluated with respect to importance, and removed — if warranted — before excavation is allowed to proceed through the site.			
	The monitor will spot check the spoils generated by tunneling. If abundant fossil remains are encountered, the monitor will have the authority to suspend tunneling until the remains are examined and evaluated, as described above, before tunneling is allowed to proceed through the site.			
	If the monitor is not onsite when fossil remains are encountered, excavation will be diverted around the fossil site until the field supervisor or monitor is called to the site, examines the remains, determines their importance, removes the remains if warranted, and allows excavation to proceed through the site.			

Table S-1
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

No Project	Alternative A (Wilton/Arlington/ Pico)	Alternative B1 (Wilton/Arlington/ Venice, Lower Elevation)	Alternative B2 (Wilton/Arlington/ Venice, Higher Elevation)	Alternative C (Crenshaw/Pico)
43. Mitigation Measures - Paleontological Resources				
	As part of the monitoring task, the monitor will test screen undisturbed sediment or spoils for smaller fossil remains, when feasible. Tunnel excavation does not allow for test screening of undisturbed sediment or spoils for smaller fossil remains. If smaller fossil remains are found by test screening, the monitor will flag the fossil site to ensure the site is not disturbed by excavation, evaluate the site by additional test screening, and -- if determined sufficiently productive -- recover a sample (not to exceed 6,000 pounds at each excavation site) of the undisturbed sediment or spoils from the fossil site for processing.			
	Fossil sites discovered as the result of monitoring will be plotted on a map of the construction site.			
	Following the completion of monitoring at each excavation site, the program manager will develop a storage maintenance agreement with a local museum to accept the fossil collections from the corridor.			
	Recovered fossil remains or fossiliferous rock samples will be transported to a laboratory facility for processing, preparation, identification, and curation. The specimens and associated geologic and geographic site data will be added into the designated museum repository for permanent storage.			
	The program manager will prepare a final report of findings summarizing the results of the mitigation program and presenting an inventory describing the scientific importance of any recovered fossil remains. The report will be submitted to the MTA and the museum repository, and will signify completion of the paleontological mitigation program.			
Unavoidable Significant Adverse Impacts				
Less than significant impact.	Impacts to paleontological resources from tunnel boring could not be mitigated to a less than significant level due to the difficulty of detecting and recovering fossil remains and associated data from the tunnels. Impacts to paleontological resources from tunnel boring and other project related excavations could result in unavoidable significant adverse impacts for Alternatives A, B, and C.			
SECTION 7.19 - SECTION 106 COMPLIANCE				
44. Findings of Potential Adverse Effects				
No impacts on historic resources have been identified.	Construction of Alternative A would not adversely affect NRHP-eligible historic properties.	*West Boulevard Overcrossing and the Venice Segment of Alternative B.* The twin tunnels (constructed within cut-and-cover concrete box structures) of the Venice Boulevard alignment would pass directly under the arches of the West Boulevard Overcrossing at a top-of-tunnel depth of only about 15 feet. Since a bridge is not a habitational structure, noise impacts would not affect its integrity as a resource. However, the factors of vibration and subsidence may represent potential impacts to the bridge since they could affect its structural integrity.		*Oxford Square Craftsman District and Crenshaw/Pico Radius in Alternative C:* If Alternative C were selected, the radius of the tunnels near the intersection of Pico and Crenshaw Boulevards would pass directly under several of the contributing properties of the Oxford Square Craftsman District. The potentially effected residences include 1246, 1252, 1258, 1261, and 1269 Victoria Avenue. The

Table S-1
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

No Project	Alternative A (Wilton/Arlington/ Pico)	Alternative B1 (Wilton/Arlington/ Venice, Lower Elevation)	Alternative B2 (Wilton/Arlington/ Venice, Higher Elevation)	Alternative C (Crenshaw/Pico)
44. Findings of Potential Adverse Effects (Cont.)				
				tops of the tunnels would be an estimated 45 feet below the surface as they passed under Oxford Square. This configuration raises the potential for ground-borne noise and vibration and for potential settlement impact during construction.
Mitigation Measures				
No mitigation is required.	No mitigation is required.	One possible solution to the vibration problem may lie in the use of special features such as high-resilience track fasteners and floating slab trackbed.		Proposed mitigation measures for noise and vibration impacts can be found in section 7.11 of the SEIS/ SEIR. These measures would reduce the projected noise and vibration effects to insignificant levels. Under these circumstances, the project would not adversely affect the Oxford Square District with respect to noise and vibration.
		The tunnels under the bridge would be installed using the cut-and-cover (i.e., excavating open trenches, constructing the tunnels, and backfilling) method. Because the open excavations would be strongly reinforced by shoring, the potential effect of subsidence would be minimized.		Since the tunnels will be built directly under Oxford Square, the potential for significant subsidence is greatened. Mitigation measures include pre-construction surveys, use of instrumentation during construction, and chemical and compaction grouting. These measures have generally proved effective. However, there is always an element of uncertainty in a tunneling project and, consequently, a potential for settlement to occur.

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No Project	Alternative A (Wilton/Arlington/ Pico)	Alternative B1 (Wilton/Arlington/ Venice, Lower Elevation)	Alternative B2 (Wilton/Arlington/ Venice, Higher Elevation)	Alternative C (Crenshaw/Pico)
44. Mitigation Measures - Findings of Potential Adverse Effects (Cont.)				
Unavoidable Significant Adverse Impacts				
All alternatives would have a less than significant impact.				
SECTION 7.20 - SECTION 4(F) EVALUATION				
45. Impacts - Historic Sites				
No impacts would occur.	No significant impacts would occur.	Construction of Alignment B could potentially adversely affect the West Boulevard Overcrossing which crosses Venice Boulevard. This bridge appears to be eligible for the National Register of Historic Places on both architectural and historical grounds. The twin subway tunnels (constructed as cut-and-cover concrete box structures) would pass under the bridge at a depth of only 15 feet, thereby introducing the possibility of damage to the structure from ground subsidence and vibrations from subway operation.		Selection of Alternative C would result in a Section 4(f) use of: 1) a potential constructive use of the Oxford Square Craftsman District which has already been determined eligible for listing in the National Register through a consensus determination by a federal agency and SHPO, and 2) two of the 57 contributors of the Windsor Village District, which appears eligible for listing on the National Register. The Alternative C tunnels would pass under the Oxford Square District. In addition, it would require temporary removal of two houses in the Windsor Village District in order to accommodate underground utility relocation necessitated by construction of the Olympic/Crenshaw Station.
46. Impacts -Public Park and Recreation Lands				
No impacts would occur.	Construction of the Pico/San Vicente Station would necessitate acquisition of the Eleanor Green Roberts Aquatic Center and demolition of the swimming pool.	There are no public park or recreation lands in the Alignment B area of potential effect.		Same impact as Alternative A.

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No Project	Alternative A (Wilton/Arlington/ Pico)	Alternative B1 (Wilton/Arlington/ Venice, Lower Elevation)	Alternative B2 (Wilton/Arlington/ Venice, Higher Elevation)	Alternative C (Crenshaw/Pico)
45. and 46. Historic Sites - Public Park and Recreation Lands (Cont.)				
Mitigation Measures				
No mitigation would be required.	*Alternatives that Would Avoid Use*: If Alternative A is selected, there is no feasible and prudent alternative to the use of the public pool site. This is because the pool is so close to the station site that it cannot be avoided.	*Alternatives that Would Avoid Use*: Selection of either Alternative A or C would avoid impacts to the West Boulevard Overcrossing. However, if alternative Alignment B is selected, there is no feasible and prudent alternative to building the subway under the West Boulevard Overcrossing. The tunnels that would pass under the bridge cannot be deeper because the Venice/San Vicente Station site is at an elevation only slightly lower than that of the bridge. Furthermore, the alignment of Alternative B cannot be shifted horizontally because it is too close to the station site to do so.		*Description of the Oxford Square Craftsman District*: The Oxford Square Craftsman District consists of nine two-story frame residences built between 1903 and 1926 which exhibit Craftsman style architecture and which collectively represent an excellent example of a period Craftsman neighborhood. The addresses of the residences are 1237-1269 Victoria Avenue. Construction of Alignment C would entail tunneling under the district (constructive use).
	Measures to Minimize Harm: In order to minimize harm to recreational lands, the MTA will commit to provide for the construction of a new public pool that would replace the loss of the existing recreational facility. The new pool would be an improvement over the existing facility because it would be purpose-built (the existing facility was retrofitted from a former police station), larger, and more efficient.	*Measures to Minimize Harm*: Harm to the bridge could be minimized or even entirely avoided by implementation of appropriate engineering measures. These include aligning the tunnels configured with the Venice Boulevard right-of-way so that they avoid passing directly under the central pier and abutments of the bridge. This could greatly reduce the potential for impacts resulting from subsidence. Since the cut-and-cover method will be used to build the twin tunnels in the area adjacent to the bridge, shoring of the excavation should minimize ground subsidence. Engineering measures will be implemented to control vibration impacts. The introduction of such features as high-resilience track fasteners and floating slab trackbed are two options.		*Measures to Minimize Harm*: Tunneling under the Oxford Square District could cause settlement impacts during construction. The top-of-tunnel depth would be approximately 50 feet. Careful monitoring and the use of an earth pressure balance (closed face) TBM and chemical and compaction grouting where necessary would help to minimize the potential affects. Nonetheless, the potential for subsidence would still exist.
	Coordination with Other Agencies: MTA has consulted with the City of Los Angeles Department of Recreation and Parks regarding acquisition of the pool facility. (See	*Coordination with Other Agencies*: A Memorandum of Agreement (MOA) was executed for the Metro Rail Project in November 1983 by the SHPO, the ACHP, the Urban Mass Transportation Administration (now the FTA) and the Southern California Rapid Transit District (now the MTA). The MOA governs the use, and protection of historic properties during Metro		The only alternative for entirely avoiding possible subsidence of the Oxford Square Craftsman District is to route the tunnel around the district and thus avoid passing

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SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

No Project	Alternative A (Wilton/Arlington/ Pico)	Alternative B1 (Wilton/Arlington/ Venice, Lower Elevation)	Alternative B2 (Wilton/Arlington/ Venice, Higher Elevation)	Alternative C (Crenshaw/Pico)
45. and 46. Mitigation Measures - Historic Sites - Public Park and Recreation Lands (Cont.)				
	Appendix D for copies of correspondence between the MTA and the City on the issue.) City staff have indicted possible support for the acquisition of the site as long as MTA provides for a replacement facility. Representatives of the City stated in meetings held on this issue that they would like the pool to be placed at or near the present location or within one and a half to two miles from the current site, and be in operation before the present pool is taken out of service. They also stated that they would like for the new site to be at least two acres in area and to be an indoor facility. Replacement at the current site would be challenging since the subway configuration of both Alternatives A and C would be very close to the surface.	Rail construction. It was amended in December 1994 for the Metro Rail Eastside Extension.		under these historic homes. However, this option is probably not desirable due to the fact that it would entail broadening the radius connecting Pico and Crenshaw Boulevards, thereby decreasing the length of track under the public rights-of-way and increasing the length passing under private property where right-of-way would have to be purchased. This would also create impacts for other property owners.
	MTA's Real Estate Department surveyed the general area in the vicinity of the pool. They made the following conclusions as part of their study: there are very few vacant lots in the area bounded by La Brea Avenue on the west and Crenshaw Boulevard on the east; the surrounding neighborhood is primarily residential except for the frontage on Pico Boulevard; and constructing a new pool on a site as large as two acres would require the	This mitigation is not required for Alternative B.		Same as Alternative A.

Table S-1 SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES				
No Project	Alternative A (Wilton/Arlington/ Pico)	Alternative B1 (Wilton/Arlington/ Venice, Lower Elevation)	Alternative B2 (Wilton/Arlington/ Venice, Higher Elevation)	Alternative C (Crenshaw/Pico)
45. and 46. Mitigation Measures - Historic Sites - Public Park and Recreation Lands (Cont.)				
	acquisition of residential properties. If Alternative A were chosen as the LPA, a comprehensive analysis of the replacement facility and location would be completed and included in the Final SEIS/SEIR.			
	This mitigation is not required for Alternative A.	This mitigation is not required for Alternative B.		*Description of the Windsor Village District*: The Windsor Square Village is an example of a 1910s-1920s neighborhood incorporating revival style architecture which has retained its integrity. The village stands out because of its architecture, set back, and consistent street landscaping with large palms. The district consists of 57 contributing features, two of which would be affected by construction of the Olympic/ Crenshaw Station (900 and 902 Victoria Avenue). The two buildings would be affected as a result of underground utility relocation necessitated by station construction.
	This mitigation is not required for Alternative A.	This mitigation is not required for Alternative B.		The utilities to be relocated are a 12-foot by 13-foot box storm drain and a 57-inch sanitary sewer. Because the stations will be at approximately the same elevation as the utilities, the utilities need to be relocated. Since two of the houses overlie the utilities, they would be temporarily moved from their lots

Table S-1
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No Project	Alternative A (Wilton/Arlington/ Pico)	Alternative B1 (Wilton/Arlington/ Venice, Lower Elevation)	Alternative B2 (Wilton/Arlington/ Venice, Higher Elevation)	Alternative C (Crenshaw/Pico)
45. and 46. Mitigation Measures - Historic Sites - Public Park and Recreation Lands (Cont.)				
				and replaced after construction is complete.
	This mitigation is not required for Alternative A.	This mitigation is not required for Alternative B.		*Avoidance Alternatives*: The use of jacking or micro-tunneling techniques was explored as an alternative method of relocating these utilities in order to avoid temporary relocation of the two buildings. However, due to the size of the utility lines and their shallow depth, this method was determined not to be feasible at this location.
	This mitigation is not required for Alternative A.	This mitigation is not required for Alternative B.		As an alternative to temporarily relocating the historic buildings during cut-and-cover construction, the buildings could be raised from their foundations to allow crawl-space access beneath them. Utility relocation would proceed below the buildings. With utility relocation complete, the buildings would be lowered onto their foundations. This alternative avoids relocation of the two homes but still results in disturbance to these historic resources. However, this measure only applies to Alternative C since there are no proposed cut-and-cover method relocations of major utilities that pass under any buildings within Alternatives A and B.

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No Project	Alternative A (Wilton/Arlington/ Pico)	Alternative B1 (Wilton/Arlington/ Venice, Lower Elevation)	Alternative B2 (Wilton/Arlington/ Venice, Higher Elevation)	Alternative C (Crenshaw/Pico)
45. and 46. Mitigation Measures - Historic Sites - Public Park and Recreation Lands (Cont.)				
	This mitigation is not required for Alternative A.	This mitigation is not required for Alternative B.		Several other alternatives for the utility relocations have been considered. A study by the City of Los Angeles Collection Systems Engineering Division (*Sewer Relocation Study*, March 1994)
				examined several alternatives and concluded only one alternative meets the needs and requirements of the City while resolving conflicts with the rail project. This alternative would reroute the utilities along Bronson Avenue. The City ascertained that this was the only alternative that employed an all gravity system to reroute flows around the project.
	This mitigation is not required for Alternative A.	This mitigation is not required for Alternative B.		*Measures to Minimize Harm*: The two houses would be temporarily moved off their locations during construction and returned to their original setting after construction is complete. The MTA, acting on behalf of the FTA, would ensure that each property is moved according to approaches recommended in *Moving Historic Buildings* (John Obed Curtis, 1979, American Association for State and Local History), in consultation with the State Historic Preservation Officer (SHPO) and by a professional mover who has the capacity to move historic structures

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No Project	Alternative A (Wilton/Arlington/ Pico)	Alternative B1 (Wilton/Arlington/ Venice, Lower Elevation)	Alternative B2 (Wilton/Arlington/ Venice, Higher Elevation)	Alternative C (Crenshaw/Pico)
45. and 46. Mitigation Measures - Historic Sites - Public Park and Recreation Lands (Cont.)				
				without damage. The MTA would ensure that both 900 and 902 Victoria Avenue would be properly secured and protected from vandalism and weather damage during the period each is unoccupied. The houses would be returned to their original location and orientation after construction.
	This mitigation is not required for Alternative A.	This mitigation is not required for Alternative B.		Adequate restrictions or conditions to ensure preservation of the properties' significant historic feature will be included if necessary in stipulations to the Memorandum of Agreement for this project for the two contributors to the Windsor Village District which are to be acquired but not altered. For this reason the effects on the Windsor Village District would be an Exception to the Criteria of Adverse Effect according to the conditions set forth in 36 CFR 800.9(c)(3). Provided these restrictions and stipulations are adopted as mitigation, the project would have no adverse effect upon the District.
				Coordination with Other Agencies: Coordination with other agencies is described above in section 7.20.2. Article IV of the National Historic Preservation Act, as amended, covers the temporary relocation of

Table S-1
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

No Project	Alternative A (Wilton/Arlington/ Pico)	Alternative B1 (Wilton/Arlington/ Venice, Lower Elevation)	Alternative B2 (Wilton/Arlington/ Venice, Higher Elevation)	Alternative C (Crenshaw/Pico)
45. and 46. Mitigation Measures - Historic Sites - Public Park and Recreation Lands (Cont.)				
				historic structures and would be applicable here.
Unavoidable Significant Adverse Impacts				
All alternatives would have a less than significant impact.				
SECTION 7.21 - ENERGY				
47. Construction Impacts - Energy Consumption				
No impacts were identified.	The estimated energy that would be consumed for the construction is about 924 billion Btu.	The estimated energy that would be consumed for the construction is about 1,001 billion Btu.		The estimated energy that would be consumed for the construction is about 886 billion Btu.
Mitigation Measures				
No mitigation would be required.	During final design, every aspect of station design will be reviewed in order to minimize lighting, heating, ventilation, and air conditioning energy requirements, as follows: • Temperature control requirements will be minimized by using the warm air exchange provided by the piston effect of the trains. • Passenger areas within stations will be designed so that the lights can be turned off during off-service hours. • In the maintenance yard, cold water will be used for vehicle washing. • The track layout will be designed to minimize non-revenue vehicle movements. • Appropriate Metro Rail facilities will have separate electric meters to facilitate energy consumption monitoring and conservation.			
Unavoidable Significant Adverse Impacts				
All alternatives would have a less than significant impact.				
48. Operation and Maintenance Impacts - Energy Consumption				
Without implementation of the proposed project fossil fuel consumption and vehicle miles traveled by private automobile would continue to increase as the population increases and regional public transportation goals would not be realized.	The estimated energy that would be consumed during operation and maintenance is about 14.8 billion Btu per year.	The estimated energy that would be consumed during operation and maintenance is about 16.0 billion Btu per year.		The estimated energy that would be consumed during operation and maintenance is about 14.2 billion Btu per year.

Table S-1
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

No Project	Alternative A (Wilton/Arlington/ Pico)	Alternative B1 (Wilton/Arlington/ Venice, Lower Elevation)	Alternative B2 (Wilton/Arlington/ Venice, Higher Elevation)	Alternative C (Crenshaw/Pico)
48. Operation and Maintenance Impacts - Energy Consumption (Cont.)				
Mitigation Measures				
No mitigation is required.	Significant kinetic energy is created when a rail train accelerates and decelerates. This energy is typically wasted. An energy conservation measure Metro Rail will use is an alternating-current (AC) propulsion subsystem option, which is more efficient than a direct current (DC) "chopper" subsystem.			
	A special aluminum-clad steel third rail—a much more effective conductor than the conventional steel rail—will be used.			
	Rail vehicles will be designed and operated so that they are switched off whenever they are not in service.			
Unavoidable Significant Adverse Impacts				
All alternatives would have a less than significant impact.				
SECTION 7.22 - ELECTRIC AND MAGNETIC FIELDS				
49. Project Impacts - Electric and Magnetic Field Impacts				
No impacts were identified.	No significant impacts to project construction workers or others as a result of EMF exposure are anticipated.			
	The typical EMF exposures are well below the IRPA's voluntary exposure limits and therefore would not result in a significant adverse effect on human health.			
Mitigation Measures				
No mitigation would be required for any of the alternatives.				
Unavoidable Significant Adverse Impacts				
All alternatives would have a less than significant impact.				

1.0 INTRODUCTION

1.1 Introduction

This Supplemental Environmental Impact Statement/Subsequent Environmental Impact Report (SEIS/SEIR) for the proposed Metro Red Line Mid-City Segment project has been prepared in accordance with the National Environmental Policy Act (NEPA), the California Environmental Quality Act (CEQA), Public Resources Code Section 21000 et seq., and the State CEQA Guidelines, Title 14, California Code of Regulations Section 15000 et seq., as amended. The proposed project must comply with both NEPA and CEQA because it will receive funding from the U.S. Department of Transportation, Federal Transit Administration (FTA), and because it is a "project" as defined by CEQA within the State of California. This SEIS/SEIR will amend the Final Supplemental Environmental Impact Statement/Supplemental Environmental Impact Report, dated August 1992, prepared for the *Mid-City Segment from Wilshire/Western to Pico/San Vicente in the City of Los Angeles with Stations at Olympic/Crenshaw and Pico/San Vicente*.

The Los Angeles County Metropolitan Transportation Authority (MTA) is the CEQA lead agency for the Subsequent Environmental Impact Report. The FTA is the NEPA lead agency for the Supplemental Environmental Impact Statement.

A Notice of Preparation (NOP)[1] was prepared and circulated from January 14, 1997 to February 21, 1997.[2] The environmental categories that were identified in the NOP are the same environmental categories that were evaluated in the August 1992 document. These categories include: transportation/circulation, geology/hydrology/subsurface gases, surface and ground water quality/floodplains, air quality/odor, land use, acquisitions and displacement, population and housing, communities/neighborhoods, visual/aesthetics, light and glare, noise, safety and security/human health/risk of upset, hazardous materials, economic and fiscal effects, public services and community/recreational facilities, cultural resources, Section 4(f) analysis, Section 106, utilities, energy, and electromagnetic fields.

This SEIS/SEIR analyzes the environmental impacts of no project, and three ~~four~~ "build" alternatives. The three ~~four~~ build alternatives evaluate rail alignment alternatives, station locations, as well as alternative station designs for an extension of the Red Line subway. All of the alternatives would extend the Metro Red Line approximately 2.5 miles from the existing station at Wilshire Boulevard and Western Avenue to a station near the intersection of Pico, San Vicente, and Venice Boulevards. An intermediate station is proposed at Olympic Boulevard on either Arlington Avenue or Crenshaw Boulevard. This SEIS/SEIR focuses on the physical environmental issues and economic concerns anticipated from the potential construction and operation of the project.

After the Mid-City segment Supplemental EIS/EIR was adopted in 1992 and a Full Funding Grant Agreement was signed with the FTA in 1993, MTA began final design on the segment. During final design of the Locally Preferred Alternative (LPA), analyzed in the adopted 1992 Supplemental EIS/EIR, high levels of hydrogen sulfide gas were found within the San Pedro Formation through which the proposed twin-tunnels were to have been constructed. The high levels of hydrogen sulfide gas caused the MTA to reassess the 1992 LPA. Since

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[1]/ Provided in Section 15.0.

[2]/ A NOP was also circulated in 1995 on a shallow underground alignment and an aerial alignment along Crenshaw and Pico Boulevards. Public scoping meetings were held in 1995 on these alignment alternatives. Due to the environmental effects associated with the aerial alignment, MTA has dropped this alternative from consideration. Refer to Section 2.6.3 for additional information on this issue. The shallow underground alignment along Crenshaw Boulevard is analyzed in this document as Alternative C (refer to Section 2.5).

1992, the MTA has prepared several engineering studies to conceptually develop additional alternative alignments that would avoid the high levels of hydrogen sulfide gas. The alternatives that were developed are being analyzed in this SEIS/SEIR; they include:

Alternative A: West on Wilshire from Western, south on Wilton/Arlington, and west on Pico Boulevard to Pico/San Vicente Underground Station.

Alternative B1: West on Wilshire from Western, south on Wilton/Arlington, and west on Venice Boulevard to Venice/San Vicente Open-Air (Within a Trench) Station.

Alternative B2: West on Wilshire from Western, south on Wilton/Arlington, and west on Venice Boulevard to Venice/San Vicente Open-Air (on a Berm) Station.

Alternative C: West on Wilshire from Western, south on Crenshaw Boulevard, and west on Pico Boulevard to Pico/San Vicente Underground Station.

1.2 Project Location

The regional project location is within the incorporated territory of the City of Los Angeles within the County of Los Angeles, as shown on Figure 1-1 (Regional Location Map). Locally, the proposed MTA Mid-City Segment is located within the Mid-City/~~Koreatown/~~Country Club Park area of the City, northeast of Culver City, south of the Hancock Park community, west of the Koreatown community, and north of the Jefferson Park community. Major roadways that act as boundaries to the project area include: Wilshire Boulevard to the north, Western Avenue to the east, Venice Boulevard to the south and La Brea Avenue to the west, as shown on Figure 1-2 (Vicinity Map).

1.3 History, Background and Purpose

In 1983, the Southern California Rapid Transit District (SCRTD), a predecessor agency of the Los Angeles County Metropolitan Transportation Authority (MTA), completed a *Final Environmental Impact Report, Los Angeles Rail Rapid Transit Project*. Also in 1983, SCRTD and the Urban Mass Transportation Administration (UMTA) completed a *Final Environmental Impact Statement, Los Angeles Rail Rapid Transit Project*. These documents evaluated the original Metro Rail Locally Preferred Alternative (LPA), an 18.6-mile subway with 18 stations. The original LPA followed Wilshire Boulevard from the Los Angeles Central Business District west to Fairfax Avenue, north on Fairfax Avenue, east along Sunset Boulevard serving Hollywood, and north to North Hollywood. The original LPA was selected to serve a major portion of the regional core of Los Angeles, a 75-square mile financial, retail, cultural, and entertainment center for southern California. In 1984, funding was not available for the full original LPA, so an *Environmental Assessment, Los Angeles Rail Transit Project, Union Station to Wilshire/Alvarado (Minimum Operable Segment 1)* prepared by ~~the~~ UMTA and ~~the~~ SCRTD was circulated for the first 4.4-mile segment of the original LPA. Federal funding was approved for this segment, and construction began in 1986. This segment was completed and became operational in 1993.

In 1985, a fire occurred at the Ross Dress-for-Less Store on Third Street, east of Fairfax Avenue. A City of Los Angeles Task Force determined the source of the fire to be naturally occurring underground methane gas that seeped into a confined area of the building with no ventilation. A spark caused the explosion and fire. In its

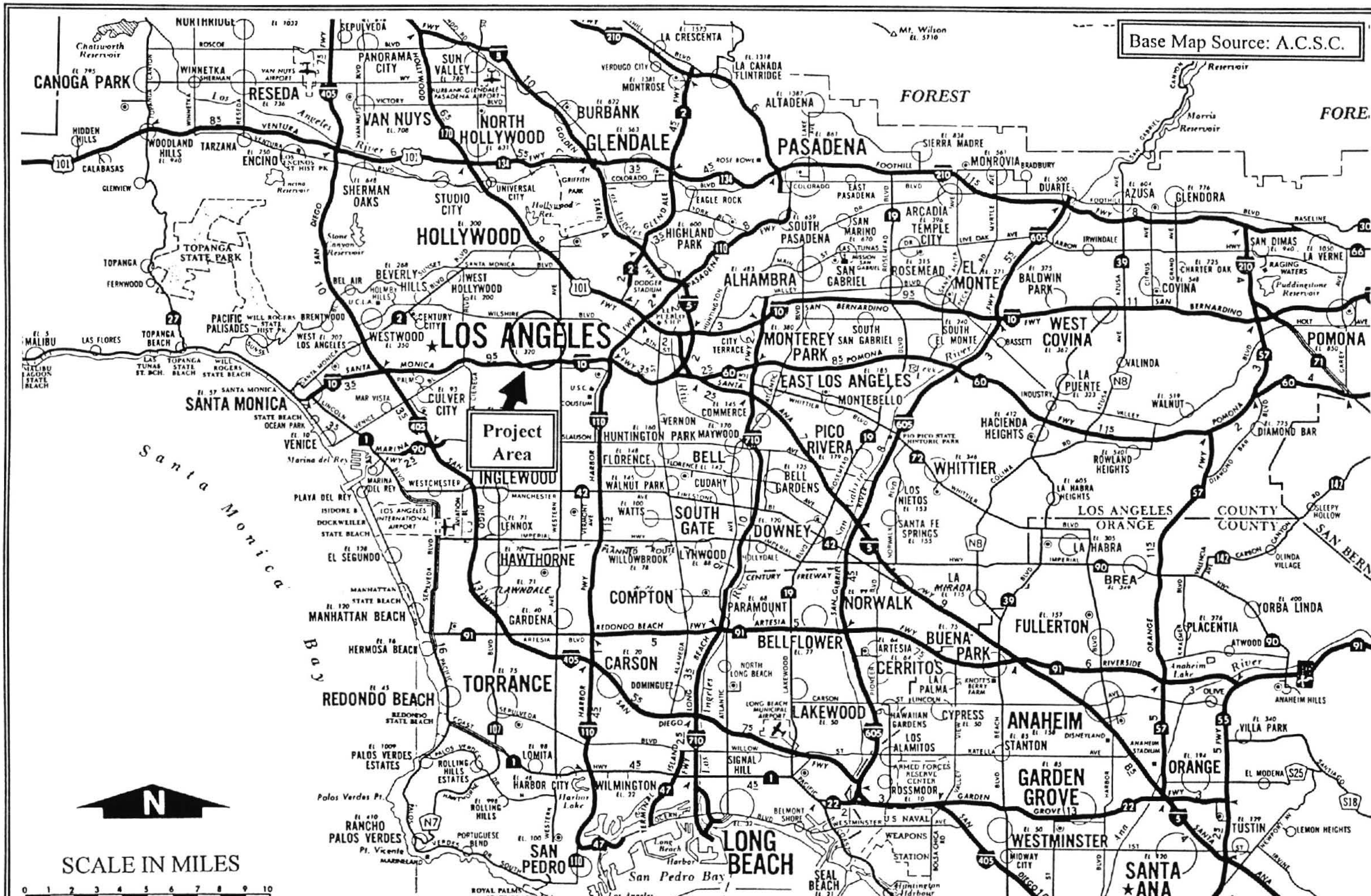

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FIGURE 1-1
REGIONAL LOCATION MAP

METRO

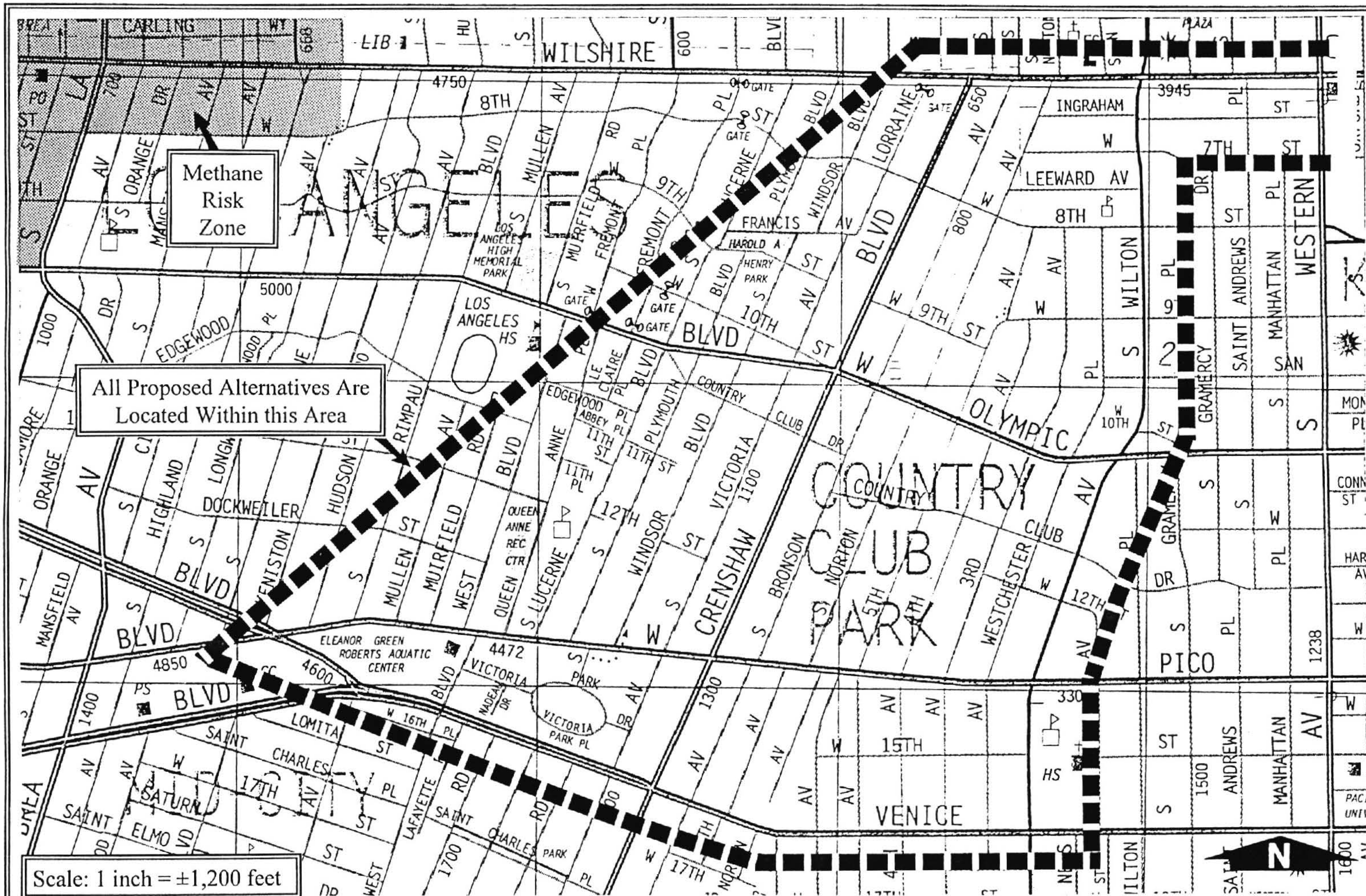

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FIGURE 1-2
VICINITY MAP

report on the fire,[3] the Task Force identified specific risk zones based on detection of methane gas in the area. The United States Congress subsequently passed a law (Public Law No. 99-1980) stipulating that federal funds could not be used to tunnel in any area identified in the City of Los Angeles study as part of the Risk Zone. Congress also directed the SCRTD to identify and study candidate Metro Rail alignments that avoided the Risk Zone. The Methane Risk Zone is shown on Figure 1-3.

In compliance with the congressional mandate, SCRTD initiated a Congressionally Ordered Re-Engineering (CORE) Study in 1986. Over 40 candidate alignments were reviewed during this effort, which included extensive public outreach efforts. Six alignments were assessed in detailed environmental reports, including a *Draft Supplemental Environmental Impact Statement/Subsequent Environmental Impact Report (SEIS/SEIR)*; *Los Angeles Rail Rapid Transit Project* (1987) and an *Addendum to the Draft SEIS/SEIR, Los Angeles Rail Rapid Transit Project* (1988), both prepared by SCRTD. One of the candidate alignments reviewed in the 1987 Draft SEIS/SEIR, called Candidate Alignment 3, included the Mid-City Segment.

In 1988, however, SCRTD's Board of Directors, due to funding constraints, selected a LPA that did not extend farther west than the Wilshire/Western station. Following the approval of Proposition C in 1991, which provided an additional local revenue source for transit, the Mid-City Segment was revisited in a *Re-Evaluation Report/ Draft Supplemental Environmental Impact Report, Los Angeles Rail Rapid Transit Project for the Mid-City Segment from Wilshire/Western to Pico/San Vicente in the City of Los Angeles with Stations at Olympic/ Crenshaw and Pico San Vicente* (January 1992) prepared by the Federal Transit Administration (FTA; formerly UMTA) and Los Angeles County Transportation Commission (LACTC), a predecessor agency of the MTA. Based on that document, the LACTC adopted the Mid-City Segment as part of the LPA in March 1992 and a Final SEIS/SEIR was adopted by the LACTC in September 1992, with a Record of Decision by the FTA in November 1992 (*Los Angeles Rail Rapid Transit Project-Metro Rail for the Mid-City Segment from Wilshire/ Western to Pico/San Vicente in the City of Los Angeles with Stations at Olympic/Crenshaw and Pico/San Vicente Final Supplemental Environmental Impact Statement and Final Supplemental Environmental Impact Report*, August 1992). On April 1, 1993 the SCRTD and the LACTC merged into one agency, the Los Angeles County Metropolitan Transportation Authority (MTA). Figure S-1 displays the LPA analyzed in the 1992 SEIS/SEIR.

Upon commencement of final design work in Spring 1993, additional geotechnical tests were conducted on the original LPA to determine the limits of hydrogen sulfide gas that were identified during preliminary engineering. The additional geotechnical tests indicated that the concentrations and flows of methane and hydrogen sulfide were much higher than originally identified, and that the mitigation measures previously identified in the August 1992 environmental document would not be sufficient to mitigate the impacts to a level of insignificance.

A Tunnel Review Board (TRB) of experts was convened in October 1993 to review the technical feasibility of the adopted LPA. The TRB was composed of seven nationally recognized experts in the fields of underground tunnel design, construction, mining, ventilation, and safety. The TRB recommended raising the alignment above the San Pedro Formation to minimize potential exposure to hydrogen sulfide during construction and operation. The San Pedro Formation is a subsurface geologic layer that has been found, under certain conditions, to contain high levels of hydrogen sulfide gas. In addition, the TRB recommended additional field investigations to verify conditions above the San Pedro Formation, and to determine to the extent possible the quantity and pressure of the gases present.

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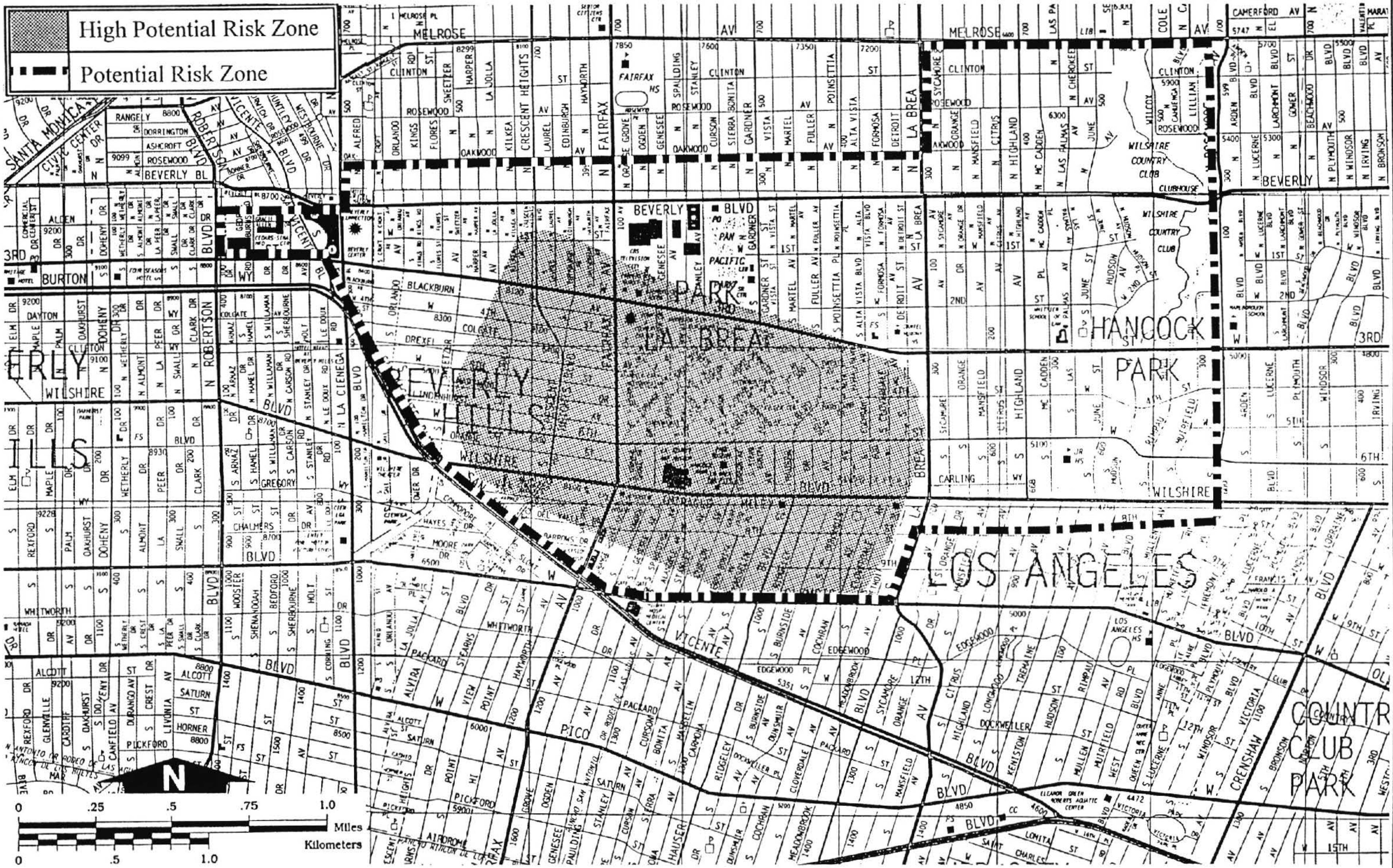
[3]/ City of Los Angeles Task Force, *Report on the March 24, 1985 Methane Gas Explosion and Fire in the Fairfax Area*, June 10, 1985.



Source: Task Force Report on the March 24, 1985 Methane Gas Explosion and Fire in the Fairfax Area, June 10, 1985

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FIGURE 1-3
METHANE RISK ZONE

Following the TRB's recommendations, the Los Angeles County Metropolitan Transportation Authority (MTA) conducted a *Mid-City Extension Reassessment Study* (July 1994) of the original LPA. This study provided additional information about research into the extent and nature of the hydrogen sulfide gas. The Study identified alternatives that would raise the alignment of the LPA above the San Pedro Formation and assessed the extent that they would minimize potential human exposure to hydrogen sulfide gas during project construction and operation.

As a result of the Reassessment Study, the MTA initiated a new SEIS/SEIR in 1994 to assess the environmental impacts of shallow cut-and-cover and aerial configurations along the original Crenshaw Boulevard horizontal alignment. Although both alternatives were determined to be safe to construct and operate, the environmental process determined that both alternatives would have considerable negative impacts on the community. These impacts included extensive property acquisitions and utility relocations through residential neighborhoods.

To develop an alternative which would reduce these community impacts, the MTA decided to explore a deep-bore tunneling option. Accordingly, in January 1996, the MTA initiated geotechnical testing of an alignment approximately one-quarter mile east of Crenshaw Boulevard. The results of this testing are documented in the *Mid-City Alternative Alignment Gas Explorations Study*, Enviro-Rail, March, 1996. This geotechnical testing, in the Wilton/Arlington corridor, encountered a maximum concentration of 90 parts per million (ppm) of H_2S, significantly lower than the concentrations over 10,000 ppm occurring along the Crenshaw alignment. Based on these findings, the MTA suspended work on the Draft SEIS/SEIR for the Crenshaw alignment and initiated further feasibility analysis of a Wilton/Arlington alignment.

This SEIS/SEIR has been prepared to address changes in the design of the Mid-City Segment. Previous environmental documents completed for this project are available and can be reviewed at the MTA Library, One Gateway Plaza, Floor 15, Los Angeles, CA 90012.

1.4 Purpose of and Need for the Proposed Project

The purpose of the Metro Red Line Mid-City Segment is to provide grade separated transit service to and from the Los Angeles "Regional Core," while complying with the federal prohibition against funding a project which would tunnel through the identified Methane Risk Zone (see Figure 1-2). The Mid-City Segment would achieve the goals of: 1) creating an effective interim terminus station adjacent to a park-and-ride and bus transit facility, and 2) increasing the number of intercepts made by the Red Line to include major east-west bus corridors such as Olympic, Pico, and Venice Boulevards. An eventual western extension of the project would serve the Westwood and Century City areas of Los Angeles, both major employment centers.

Benefits of the Metro Rail Mid-City Segment include increased accessibility to and from the Regional Core, improved travel times, decreases in vehicle hours of travel, and improved transportation connectivity. The need for the proposed project includes severe traffic congestion in the Regional Core, limited opportunities to make additional highway/arterial improvements, overcrowding of the present bus system, and the need for a more efficient transit system. In addition, a more efficient transit system would save users time and encourage increased transit usage. The Metro Red Line Mid-City Segment would be consistent with, and would accelerate the achievement of numerous goals and policies pertaining to transportation, air quality, energy conservation, economic development, and commercial growth which are contained in the City of Los Angeles General Plan, SCAG Regional Transportation Plan, the AQMP, and MTA's Long Range Transit Plan.[4]

4/ *Los Angeles Rail Rapid Transit Project - Metro Rail Final Supplemental Environmental Impact Statement/Subsequent Environmental Impact Report*, p. S-6-1, July 1989.

1.5 Statement of the Objectives of the Proposed Project

The Los Angeles County Metropolitan Transportation Authority (MTA) is the public transportation agency responsible for planning, designing, building, and operating the region's Metro Bus and Rail System. The objectives of the proposed Metro Red Line Mid-City Segment project include:

- Extending the Red Line from the existing Wilshire/Western Station in a westerly direction to a new interim terminus station near the Venice/Pico/San Vicente Boulevards intersection.

- Providing convenient transfer locations between the Red Line and other modes of transportation.
- Providing better travel time to, from, and through the Mid-City area.
  - Improving travel time savings on highly congested streets.
  - Intercepting several high ridership bus lines and serves residential areas with a high transit dependency population.

- Offering a better interim terminus than Wilshire/Western by providing a park-and-ride facility ~~(the only one in this part of the County)~~, a bus/rail transfer facility, and a kiss-and-ride.

- Extending a grade separated subway travel mode to the Mid-City area to reduce vehicular traffic congestion and improve air quality by providing better access to a more efficient transit system.

- Contribute to the achievement of air quality goals in a region that is currently a severe non-attainment area for two criteria pollutants.

- Achieving consistency with the adopted SCAG Regional Transportation Plan and City of Los Angeles General Plan, and contribute to the effectiveness of the overall transportation program.

- Minimizing e neighborhood disruption during construction and operation.

- Ensuring the safety of the residents from potential environmental hazards during construction and operation.

- Utilizing appropriate technology and equipment to construct the project safely.

- Enhancing economic development of the station areas, particularly the Pico/Venice/San Vicente Station area.

- Maintaining residential integrity of the Olympic/Arlington or Olympic/Crenshaw station areas and surrounding the Pico/ or Venice/San Vicente Station area.

- Creating secure and safe stations for patrons.

- Providing design features at the station that are user friendly.

- Providing neighborhood and pedestrian oriented stations.
- Improving transit services to a transit-dependent area.

- Providing transit-dependent job seekers greater access to regional job opportunities.

- Saving transit system users time and money through greater efficiency.

1.6 Report Focus, Organization, and Review Process

The environmental analyses contained within this SEIS/SEIR focuses on the no project alternative and ~~three~~ ~~four~~ "build" alternatives which include different rail alignments, station locations, and alternative station designs. All of these alternatives are considered safe and feasible to construct with respect to subsurface hydrogen sulfide gas deposits. Because of the discovery of hydrogen sulfide gas, the previous LPA which was approved in 1992 (the deep-tunnel alignment down Crenshaw Boulevard) is no longer considered viable and is therefore not included as a project alternative.

This document supplements previous environmental documents completed for the project. Existing and anticipated future conditions, without the project (i.e., No Project Alternative), have been updated as appropriate. Impact analyses are presented for all of the project alternatives and are included within Section 7.0 (Environmental Impact Analysis). Mitigation Measures listed in this report supersede those identified in previous NEPA/CEQA documents.

Each environmental analysis section of this SEIS/SEIR is generally organized into the following subsections: Environmental Setting, Project Impacts, Cumulative Impacts, Mitigation Measures, and Level of Significance After Mitigation. The format of each section is tailored specifically to the topic being discussed. Where appropriate the Project Impacts and Cumulative Impacts sections are separated into "Construction" impacts and "Operation and Maintenance" impacts.

The "Environmental Setting" sections of this SEIS/SEIR describe the "existing conditions" of the environment in the vicinity of the project area as it pertains to the environmental issue being analyzed (40 C.F.R. 1502.15 (NEPA); Section 15125 of the State CEQA Guidelines).

The "Project Impact" sections of this SEIS/SEIR identify and focus on the significant environmental effects of the proposed project. The direct and indirect significant effects of the proposed project on the environment are clearly identified and described, giving due consideration to both the short-term and long-term effects as necessary (40 C.F.R. 1502.16 and 1508.8 (NEPA); Section 15126(a) of the State CEQA Guidelines). Where appropriate these sections are separated into "Construction Impacts" and "Operation and Maintenance" impacts.

The "Cumulative Impact" sections of the SEIS/SEIR are based on a list of existing and reasonably anticipated future related projects in the Mid-City area of the City of Los Angeles. The discussion of cumulative impacts provides a reasonable analysis which reflects the severity of the impacts and their likelihood of occurrence, but the discussion is not provided in as great detail as is provided for the effects attributable to the proposed project alone (40 C.F.R. 1508.7 (NEPA); Section 15130 of the State CEQA Guidelines). Where appropriate these sections are separated into "Construction Impacts" and "Operation and Maintenance" impacts.

The "Mitigation Measures" sections of this SEIS/SEIR identify and describe measures which will minimize significant adverse impacts. This discussion identifies mitigation measures for each significant, adverse environmental effect identified in the SEIS/SEIR (40 C.F.R. 1508.20 (NEPA); Section 15126© of the CEQA Guidelines). The mitigation measures, where feasible, are reflected as conditions of project approval which serve to mitigate identified impacts brought forth for discussion of each environmental issue.

The "Unavoidable Significant Adverse Impacts" section identifies unavoidable adverse effects where mitigation is not expected to reduce the effects to insignificant levels.

This SEIS/SEIR is assembled in a manner that provides for a detailed environmental analysis of each identified alternative, including the No Project Alternatives. To facilitate this intent, the organization of this SEIS/SEIR includes the following sections: summary, introduction, description of alternatives, operational characteristics, construction methods, estimated project costs, related projects, environmental impact analysis, economic and fiscal impacts, unavoidable adverse impacts, environmentally superior alternative, relationship between local short-term uses of the environment and the maintenance and enhancement of long-term productivity, irreversible and irretrievable commitment of resources, growth-inducing impacts, public involvement program, notice of preparation/initial study, references/bibliography, document preparers, and document recipients.

The review process for this SEIS/SEIR will include opportunities for public review and comment. There will be a 45-day review period during which written comments on this document can be submitted. In addition, a public hearing will be conducted to allow for oral comments on the SEIS/SEIR. Both written and oral comments will be responded to in the Final SEIS/SEIR. A more detailed discussion of public involvement during the environmental process can be found in Section 14.0 (Public Involvement Program) of this document.

A Public hearing on this project will be held on the following date and time, and at the following location:

____

Comments can also be submitted by mail to:

> Kevin Michel, Project Manager, Los Angeles County Metropolitan Transportation Authority
> Mail Stop 99-22-2, One Gateway Plaza, Los Angeles, CA 90012-2932

Comments are due by _____, 1997 in order to receive consideration. Please include the name and telephone number of a contact person in your agency for continued coordination. Kevin Michel can also be reached at (213) 922-2854 or by E-mail at MichelK@mta.net.

2.0 DESCRIPTION OF ALTERNATIVES

2.1 Introduction

This document analyzes three ~~four~~ newly designed "build" alternatives to the Red Line Mid-City Segment Locally Preferred Alternative (LPA) that was adopted in 1992. The existing LPA consists of a subway line that would have extended from the existing terminus station located at the intersection of Wilshire Boulevard and Western Avenue to a new terminus station east of the intersection of Pico and San Vicente Boulevards in the area of the existing MTA Pico/Rimpau Transit Center. The new terminus station site would have included an expanded bus transit center and new park-and-ride and kiss-and-ride facilities. An intermediate station would have been located at the intersection of Olympic and Crenshaw Boulevards.

Final design for the selected Mid-City LPA began in spring 1993. Additional geotechnical tests indicated that the concentrations and flows of subsurface hydrogen sulfide gas (H_2S) along this alignment were much higher than originally identified, and that the gas mitigation measures previously identified were insufficient to ensure safe construction and operations. The concern over H_2S is that it is a toxic gas at higher concentrations and has an objectionable odor at very low concentrations. Properties of H_2S and related geologic information can be found in the referenced reports: EMC, 1994; Enviro-Rail, 1994.[1]

A Tunnel Review Board (TRB) was originally convened in October of 1993 to review the technical feasibility of the adopted alignment. The TRB recommended raising the alignment above those areas of the San Pedro Formation that contain the high H_2S concentrations to minimize potential exposure to the gas. Some sections of the San Pedro Formation are safe for tunneling since H_2S is not always present or is present at an insignificant level.

Following the TRB's recommendations, the MTA conducted a *Mid-City Extension Reassessment Study* (July 1994) to provide additional research as to the extent and nature of the H_2S. This study also assessed alternative vertical alignments that were raised above the San Pedro Formation in order to avoid potential exposure to H_2S gas during project construction and operations. The study also researched gas occurrences west of the Mid-City area to determine the geographic extent of the gases.

As a result of the Reassessment Study, the MTA initiated a new SEIS/SEIR in 1994 to assess the environmental impacts of the raised alternative above the San Pedro Formation. These consisted of shallow cut-and-cover and aerial configurations along the original Crenshaw Boulevard horizontal alignment. This environmental process determined that both alternatives would have considerable negative impacts on the community. These impacts included extensive property acquisitions to maintain the traffic lanes on Crenshaw and Pico Boulevards, while accommodating an aerial structure. The aerial alternative was removed from further consideration. The shallow cut-and-cover alternative also would have considerable negative impacts on the community, but less so than the aerial alternative. The shallow cut-and-cover alternative has been retained and is being analyzed in this document.

To develop additional alternatives that would reduce these community impacts, the MTA decided to explore a deep-bore tunneling option. Accordingly, in January 1996, the MTA initiated geotechnical testing of an alignment approximately one-quarter mile east of Crenshaw Boulevard. The results of this testing are

[1]/ These reports are on file at the MTA Headquarters Library, One Gateway Plaza, Los Angeles, CA.

documented in the *Mid-City Alternative Alignment Gas Explorations Study,* Enviro-Rail, March, 1996.[2] This geotechnical testing, in the Wilton/Arlington corridor, encountered a maximum concentration of 90 parts per million (ppm) of H_2S in one localized area, significantly lower than the concentrations of over ~~up to~~ 10,000 ppm occurring along the Crenshaw alignment. Based on these findings, the MTA suspended work on the Draft SEIS/SEIR for the Crenshaw alignment and initiated further feasibility analysis of a Wilton/Arlington alignment. The TRB's unanimous conclusion upon completing the feasibility analysis, was that it would be safe to construct and operate a deep bore tunnel alignment along Wilton Place and Arlington Avenue.

The following alternatives reflect the results of MTA's efforts to identify a feasible alternative for extending the Red Line from the existing Wilshire/Western Station to a new terminus station east of the Pico and San Vicente intersection.

2.2 No Project Alternative

The No Project Alternative (also referred to as the No Build Alternative) assumes that the Mid-City Segment would not be built and that the western terminus of the Metro Red Line would remain at the Wilshire/Western Station. This alternative is discussed in Section 3.1 of the 1992 SEIS/SEIR (*Los Angeles Rail Rapid Transit Project - Metro Rail for the Mid-City Segment from Wilshire/Western to Pico/San Vicente in the City of Los Angeles with stations at Olympic/Crenshaw and Pico/San Vicente Final Supplemental Environmental Impact Statement and Final Supplemental Environmental Impact Report, August 1992*). It was rejected in March 1992 when the LACTC adopted the Mid-City Segment as part of the LPA. The No Project Alternative is used in this document as a baseline against which project impacts are compared.

2.3 Wilton/Arlington/Pico Boulevard Approach to Pico/San Vicente Underground Station (Alternative A)

Alternative A is a proposed 2.4-mile, two-station, westerly extension of the existing Metro Red Line. As shown in Figure 2-1 (5 pages), it would extend the subway alignment of the Red Line from the ~~western end of the tail tracks serving the~~ existing ~~underground station at the intersection of Wilshire Boulevard and Western Avenue (~~Wilshire/Western Station~~)~~ to a new underground station just south of Pico Boulevard between San Vicente and West Boulevards. ~~and~~ From the western end of the Wilshire/Western Station the Alternative A alignment ~~it~~ would immediately turn in a southerly direction under private property until it aligns with Wilton Place, immediately south of Leeward Avenue. The alignment would continue under Wilton Place until a point just north of San Marino Street where it would veer slightly westward under private property to allow for a straight approach into a new Olympic/Arlington Station. The Olympic/Arlington Station would be constructed just south of Olympic Boulevard within the ~~under~~ Arlington Avenue right-of-way. ~~The Olympic/Arlington Station entrance plaza would be located on the southwest corner of the intersection of Olympic Boulevard and Arlington Avenue intersection.~~ South of the Olympic/Arlington Station, near West 12th Street, the Alternative A alignment would turn in a westerly direction under private property to a point west of 3rd Avenue and Pico Boulevard, and would proceed in a westerly direction under Pico Boulevard. The alignment would continue in a westerly direction under Pico Boulevard until a point near West Boulevard where it would veer in a slight southerly direction to an underground station on the property, parallel to Pico Boulevard, and ~~on a site~~ bounded by West, Pico, San Vicente, and Venice Boulevards.

The majority of this alignment would be constructed as twin, deep-bore tunnels. The distance between the surface of the ground and the top of the tunnels would range between 29 and 60 feet at various places along the

2/ This report is on file at the MTA Headquarters Library, One Gateway Plaza, Los Angeles, CA.

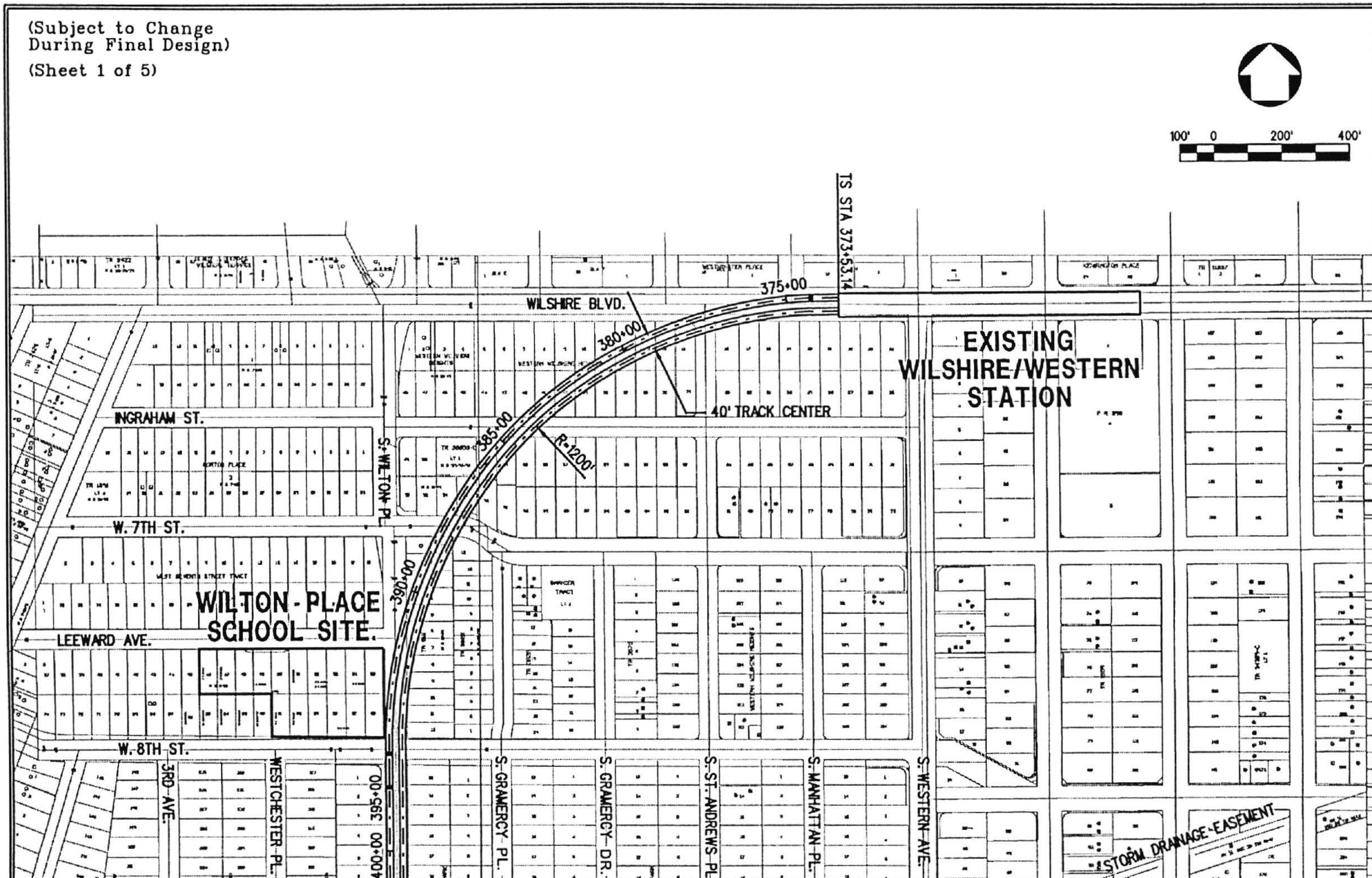

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FIGURE 2-1
WILTON/ARLINGTON/PICO BOULEVARD APPROACH TO THE PICO/SAN VICENTE STATION (ALTERNATIVE A)

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FIGURE 2-1

WILTON/ARLINGTON/PICO BOULEVARD APPROACH TO THE PICO/SAN VICENTE STATION (ALTERNATIVE A)

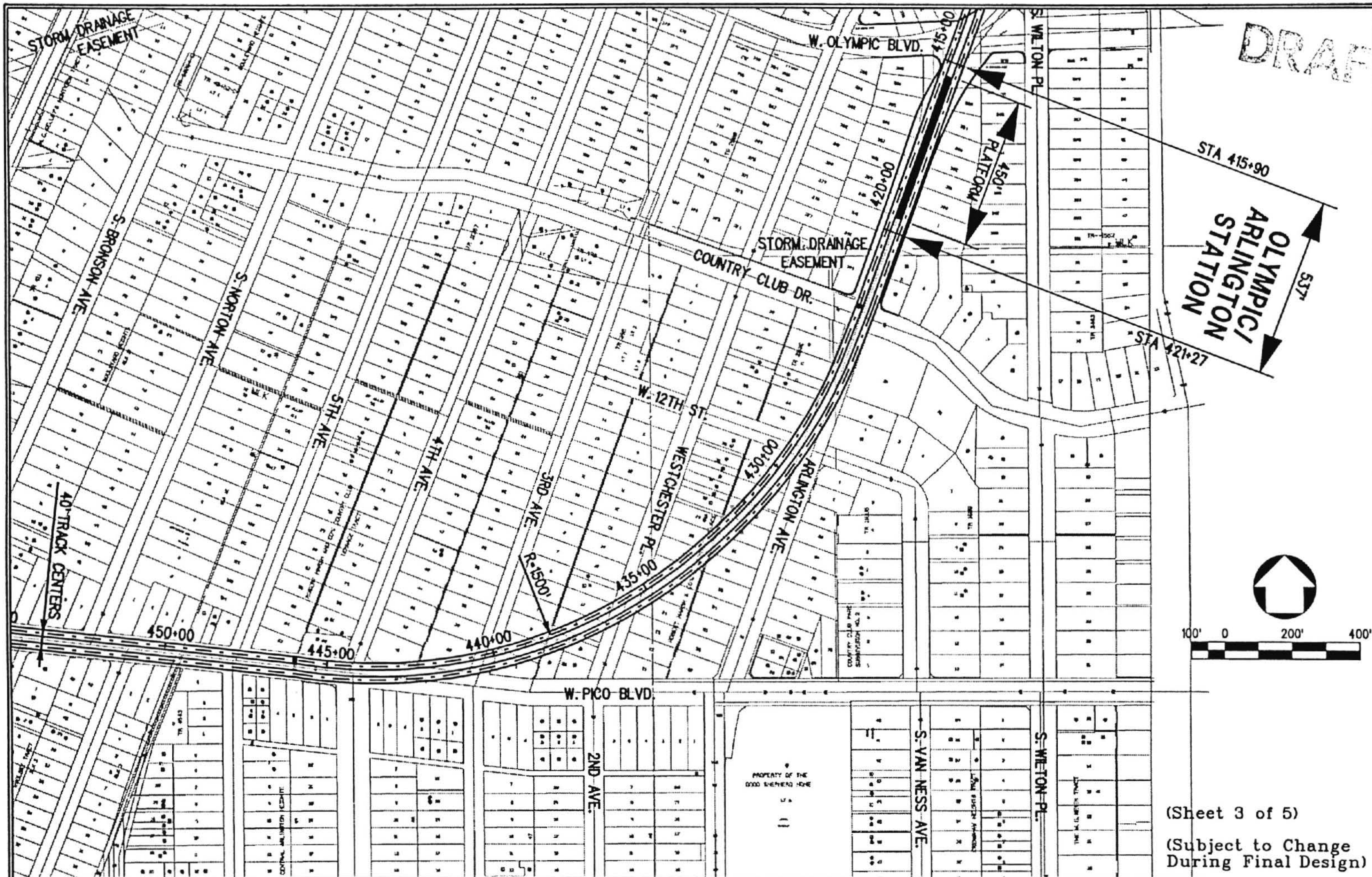

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FIGURE 2-1

WILTON/ARLINGTON/PICO BOULEVARD APPROACH TO THE PICO/SAN VICENTE STATION (ALTERNATIVE A)

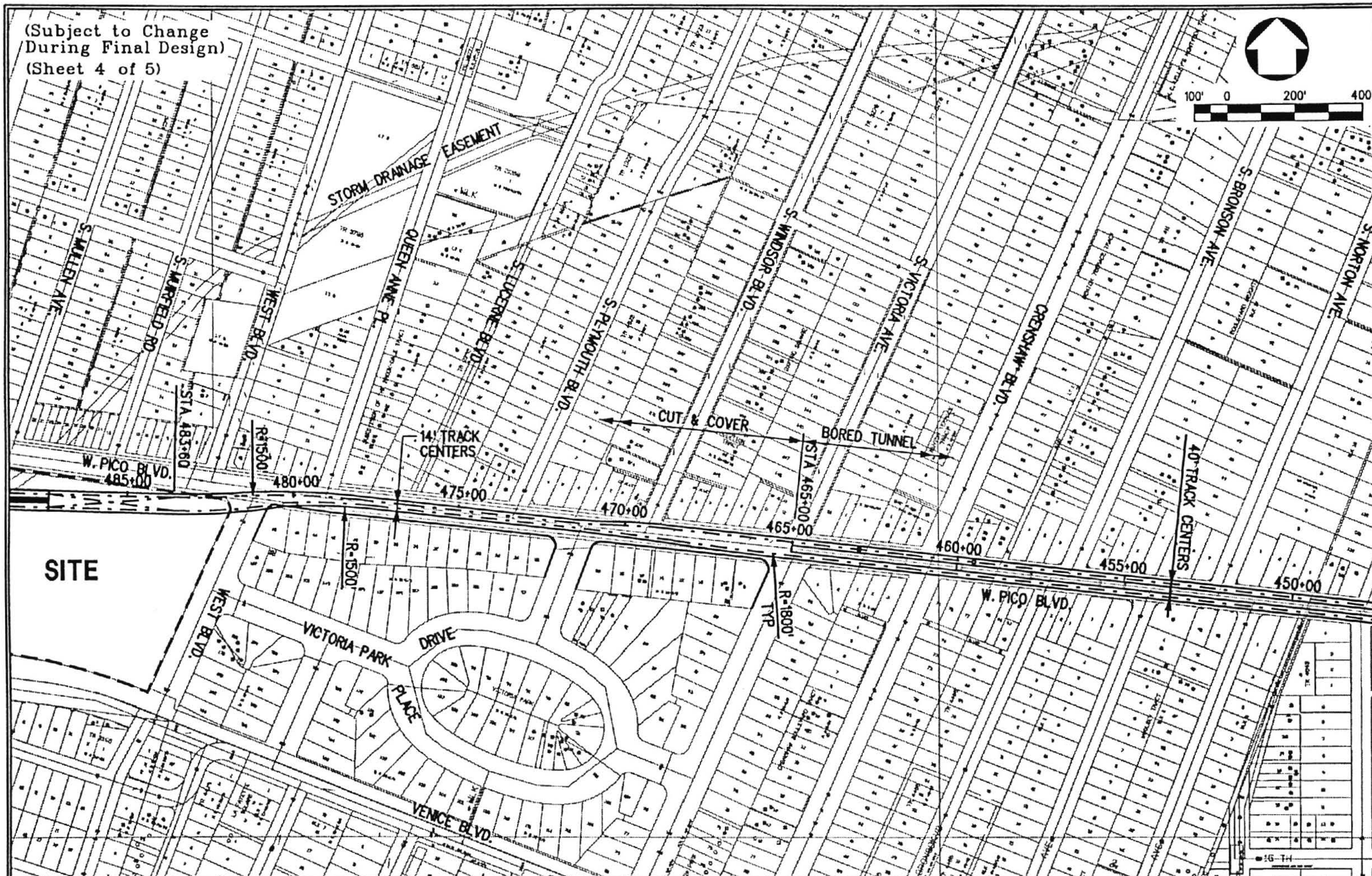

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FIGURE 2-1
WILTON/ARLINGTON/PICO BOULEVARD APPROACH TO THE PICO/SAN VICENTE STATION (ALTERNATIVE A)

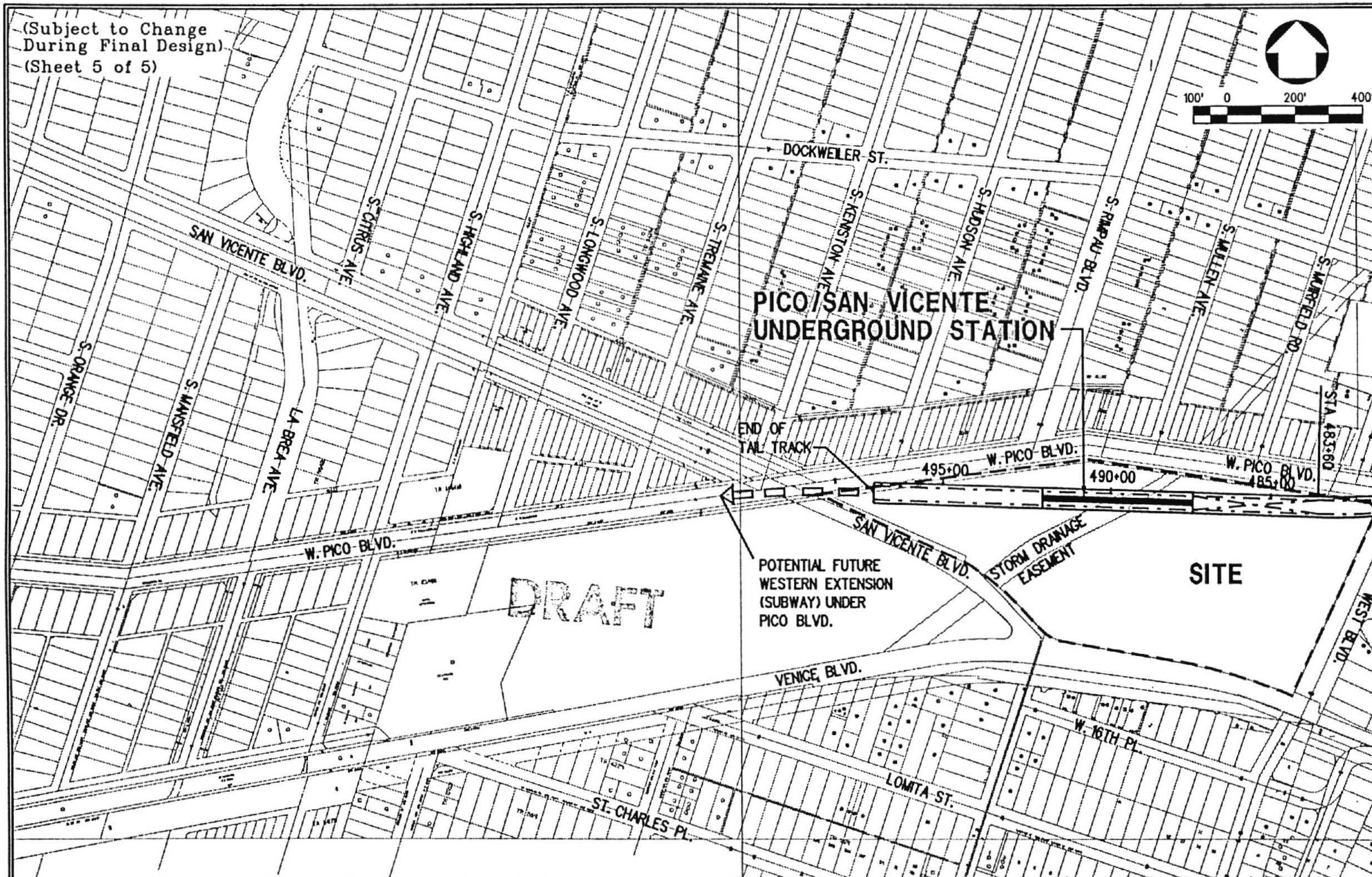

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FIGURE 2-1
WILTON/ARLINGTON/PICO BOULEVARD APPROACH TO THE PICO/SAN VICENTE STATION (ALTERNATIVE A)

alignment. ~~With the exception of the Olympic/Arlington Station, the~~ Twin, deep-bore tunnels would extend from the existing Wilshire/Western Station to the vicinity of Pico Boulevard and Victoria Avenue where the construction method would change from deep-bore tunnels to cut-and-cover. Between Victoria Avenue and the west side of West Boulevard, a distance of approximatley 1,700 feet within the public right-of-way, ~~Pico/San Vicente Station (approximately 3,200 1,920 feet)~~ a trench would be excavated from the surface and a 2-cell reinforced concrete box structure would be constructed within the trench. As soon as the trench reached sufficient depth, a temporary decking system would be installed over the trench to allow traffic to continue to flow along Pico Boulevard while construction continued underneath. Between the west side of West Boulevard and the end of the Pico/San Vicente Station tail track a trench, approximately 1,500 feet long, would be excavated on private property. Within this 1,500 foot segment of the alignment would be the crossover track, the station box, and the tail track.

The twin deep-bore tunnels would be shallowest between the Wilshire/Western Station and the Olympic/ Arlington Station. The shallowest point (29 feet) to the top of the tunnels would be located near the position where the tunnels would be just east of the Wilton Place right-of-way between 7th Street and Leeward Avenue. Between the Olympic/Arlington Station and the cut-and-cover segment of the alignment beginning at Pico Boulevard and Victoria Avenue the tunnels would reach their deepest depths. The twin deep-bore tunnels would be deepest near the intersection of Pico Boulevard and 3rd Avenue. The depth of the top of the tunnels at their junction with the cut-and-cover segment would be approximately 40 feet. Between Victoria Avenue and the Pico/San Vicente Station the depth of the concrete box would slowly be reduced until it reached it's shallowest depth of approximately 10 feet immediately west of West Boulevard.

2.3.1 Olympic/Arlington Underground Station[3]

The Olympic/Arlington Station would be located in the public right-of-way beneath Arlington Avenue immediately south of its intersection with Olympic Boulevard. This station would be a two- level underground subway station approximately 537 feet long with a 450 foot long platform. An entrance plaza to the station would be located ~~on the property~~ on the southwest corner of the Olympic/Arlington intersection. Figure 2-2 shows the conceptual site plan for the Olympic/Arlington Station. This station would be constructed by a cut-and-cover method similar to the cut-and-cover method described above. A trench would be excavated from the surface and the station would be constructed within the trench. As soon as the trench excavation reached sufficient depth (generally averaging between 5 and 10 feet), a temporary decking system would be installed over the trench to allow sidewalks and traffic to continue to flow along Arlington Avenue while station construction continued underneath.

Figure 2-2 shows that portion of the block bounded by Olympic Boulevard on the north, Arlington Avenue on the east, Country Club Drive on the south, and Westchester Place on the west that would be required for use as a construction staging area for the Olympic/Arlington Station. This figure also shows that portion of the construction staging area (not being utilized for station entrance plaza and facilities) that would be ~~jointly developed~~ available for development (consistent with existing zoning) upon completion of the station construction.

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[3]/ The location of the Olympic/Arlington Station was studied and reviewed numerous times prior to the location analyzed in this document becoming final. The record of the Olympic/Arlington Station review is provided in Appendix K of the Technical Appendices.

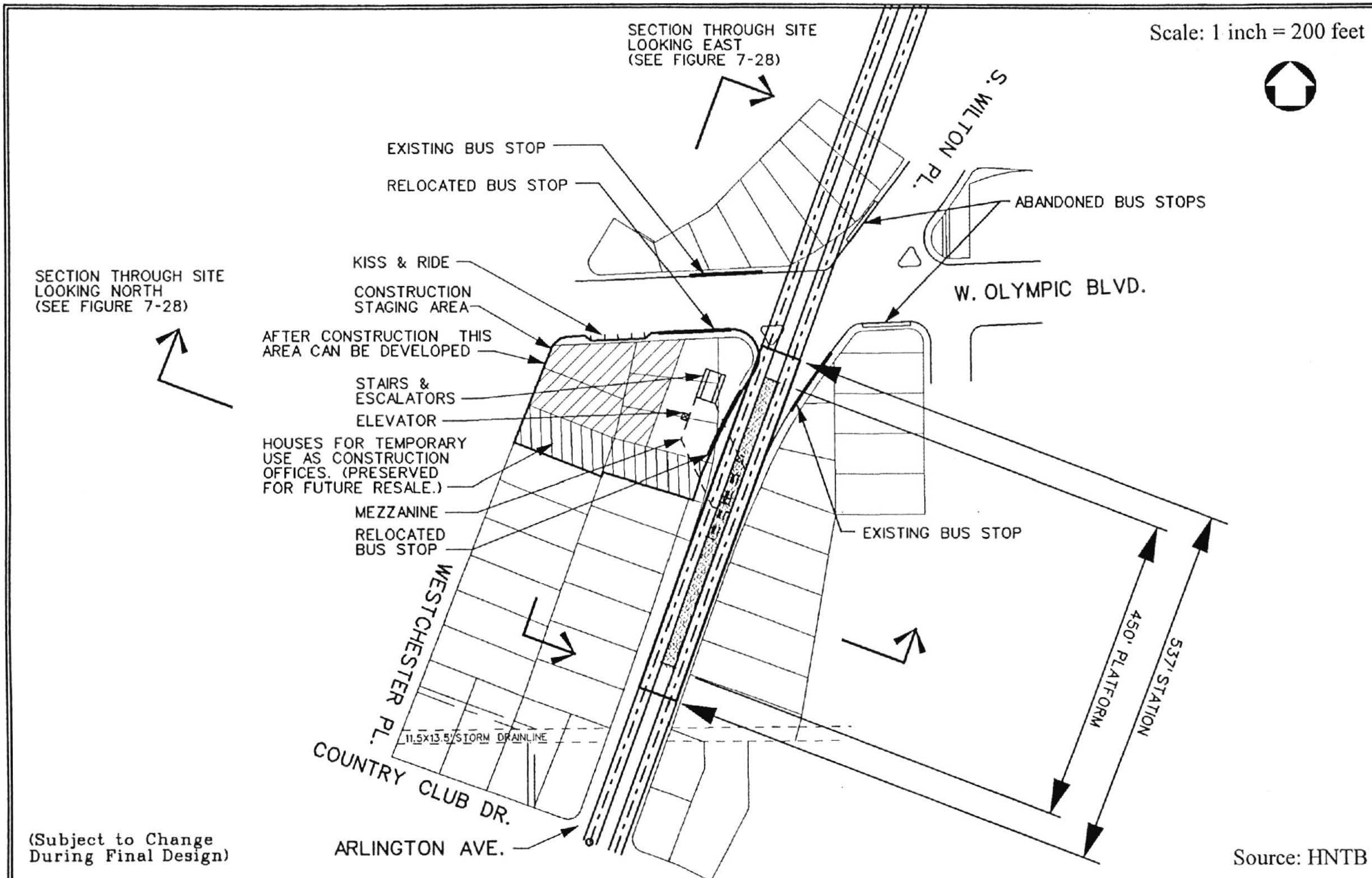

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FIGURE 2-2
CONCEPTUAL SITE PLAN FOR THE OLYMPIC/ARLINGTON STATION (ALTERNATIVES A & B)

2.3.2 Pico/San Vicente Underground Station

The Pico/San Vicente Underground Station, a terminus station, would be a one-level station, consisting of a 372 foot crossover structure plus a public center-load platform approximately 450 feet long. Tail tracks, for the storage of trains, would continue for 500 feet beyond the station. The station, crossover, and tail tracks would be in a reinforced concrete box structure constructed within an open trench~~ using a cut-and-cover method~~. The Pico/San Vicente Station would provide an enlarged bus transfer facility, a park-and-ride facility with an ultimate capacity of up to 1,000 parking spaces in a multi-level structure, kiss-and-ride facilities, bicycle storage facilities, and convenient/safe pedestrian access. Figure 2-3 shows the conceptual site plan for the Pico/San Vicente Underground Station. As shown in this figure, this alternative would allow for a potential future western extension of the Red Line (subway) under Pico Boulevard.

The entire block bounded by Pico Boulevard on the north, West Boulevard on the east, Venice Boulevard on the south, and San Vicente Boulevard on the west that would be acquired for use as a construction staging area for the construction of this alternative. That portion of the construction staging area (not being utilized for station entrance area facilities or other project parking facilities) would be~~ jointly developed~~ available for development (consistent with existing zoning) upon completion of the station construction.

2.4 ~~Wilton/Arlington/Venice Boulevard Approach to Venice/San Vicente Open Air (Lower Elevation) Station (Alternative B1)~~ Wilton/Arlington/Venice Boulevard Approach to Venice/San Vicente Open Air Station (Alternative B)

Alternative B~~1~~ for the Metro Red Line Mid-City Segment is a proposed 2.6-mile, two station, extension of the existing Metro Red Line. As shown in Figure 2-4, this alternative alignment would be exactly the same as the alignment described above for Alternative A ~~alignment~~ between the existing underground Wilshire/Western Station and the proposed Olympic/Arlington Station. The alignment of Alternative B~~1~~ would begin to differ from Alternative A at a point just south of the Olympic/Arlington Station. Alternative B~~1~~ would continue south from the Olympic/Arlington Station under Arlington Avenue until a point immediately south of Pico Boulevard, where the alignment would turn in a westerly direction under private property traversing towards Venice Boulevard. The alignment would be under Venice Boulevard at a point between 5th and 6th Avenues, where it would continue in a westerly direction until it reached West Boulevard. At that point it would veer in a slight northerly direction to conclude in a terminus station on private property north of Venice Boulevard and just east of San Vicente Boulevard.~~ This alignment would be constructed as twin, deep-bore tunnels except between Victoria Avenue and the Venice San/Vicente Station, where construction would use the cut-and-cover method.~~

The Alternative B ~~majority of this~~ alignment would be constructed as twin deep-bore tunnels. The distance between the surface of the ground and the top of the tunnels would range between 29 and 60 feet. The shallower segments of the alignment are closer to Wilshire Boulevard and the deeper segments of the alignment are closer to Venice Boulevard. ~~With the exception of the Olympic/Arlington Station, the~~ The twin deep-bore tunnels would extend from the existing Wilshire/Western Station to the vicinity of Venice Boulevard and Victoria Avenue where the construction method would change from deep-bore tunnels to cut-and-cover for a distance of approximately 1,920 feet. Between Victoria Avenue and the Venice/San Vicente Station, a trench would be excavated from the surface and a 2-cell reinforced concrete box structure would be constructed within the trench. As soon as the trench reached sufficient depth, a temporary decking system would be installed over the trench to allow traffic to continue to flow along Venice Boulevard while construction continued underneath. A storm drain relocation would be required in Venice Boulevard (between Victoria Avenue and West Boulevard) prior to beginning the subway construction. The length of cut-and-cover was increased within Venice Boulevard in order to leave room for a potential future Crenshaw/Prairie Line.

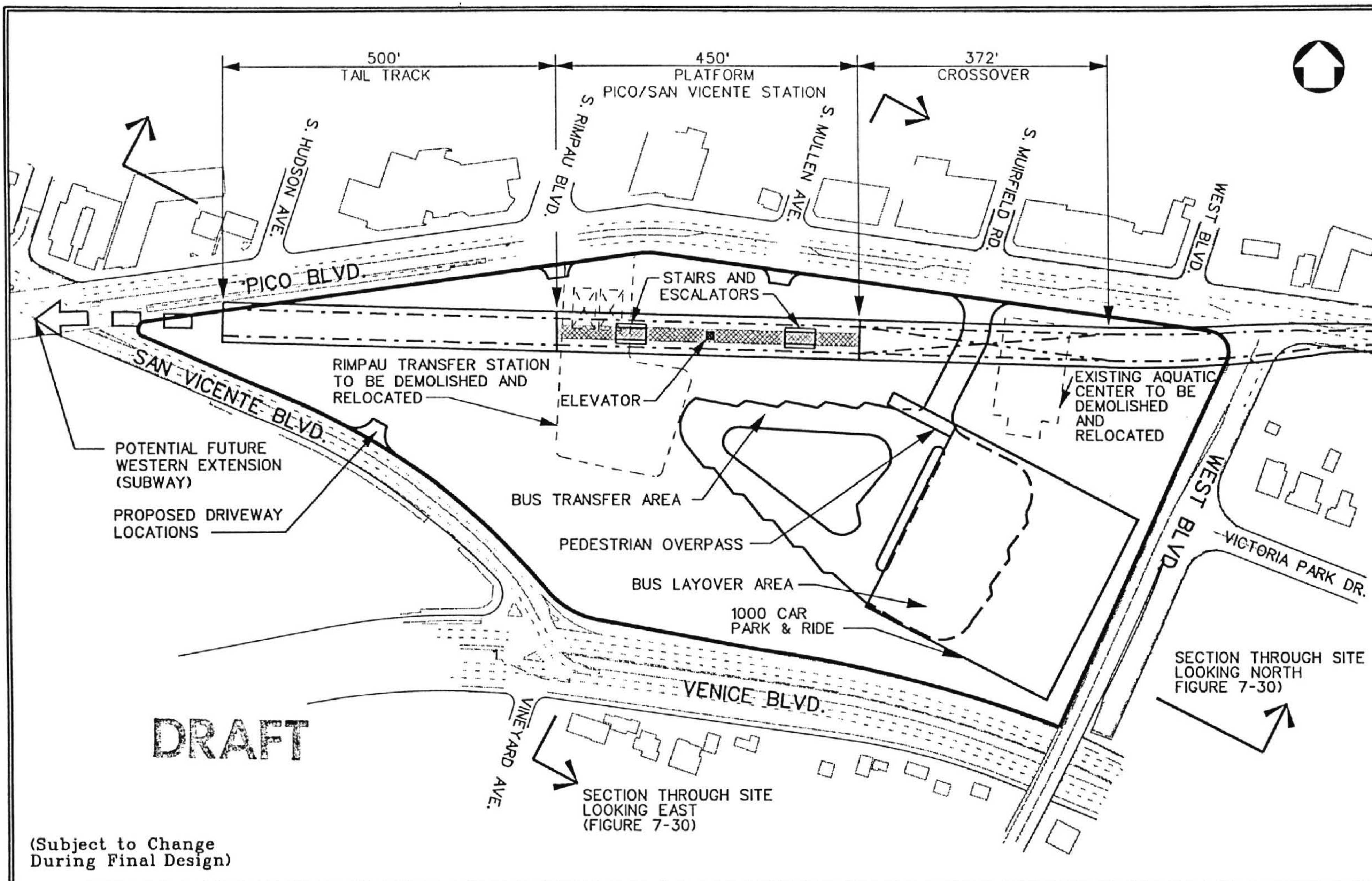

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FIGURE 2-3
CONCEPTUAL SITE PLAN FOR THE PICO/SAN VICENTE STATION (ALTERNATIVES A & C)

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FIGURE 2-4
WILTON/ARLINGTON/PICO BLVD. APPROACH TO THE VENICE/SAN VICENTE STATION (ALTERNATIVES B1 & B2)

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FIGURE 2-4

WILTON/ARLINGTON/PICO BLVD. APPROACH TO THE VENICE/SAN VICENTE STATION (ALTERNATIVES B1 & B2)

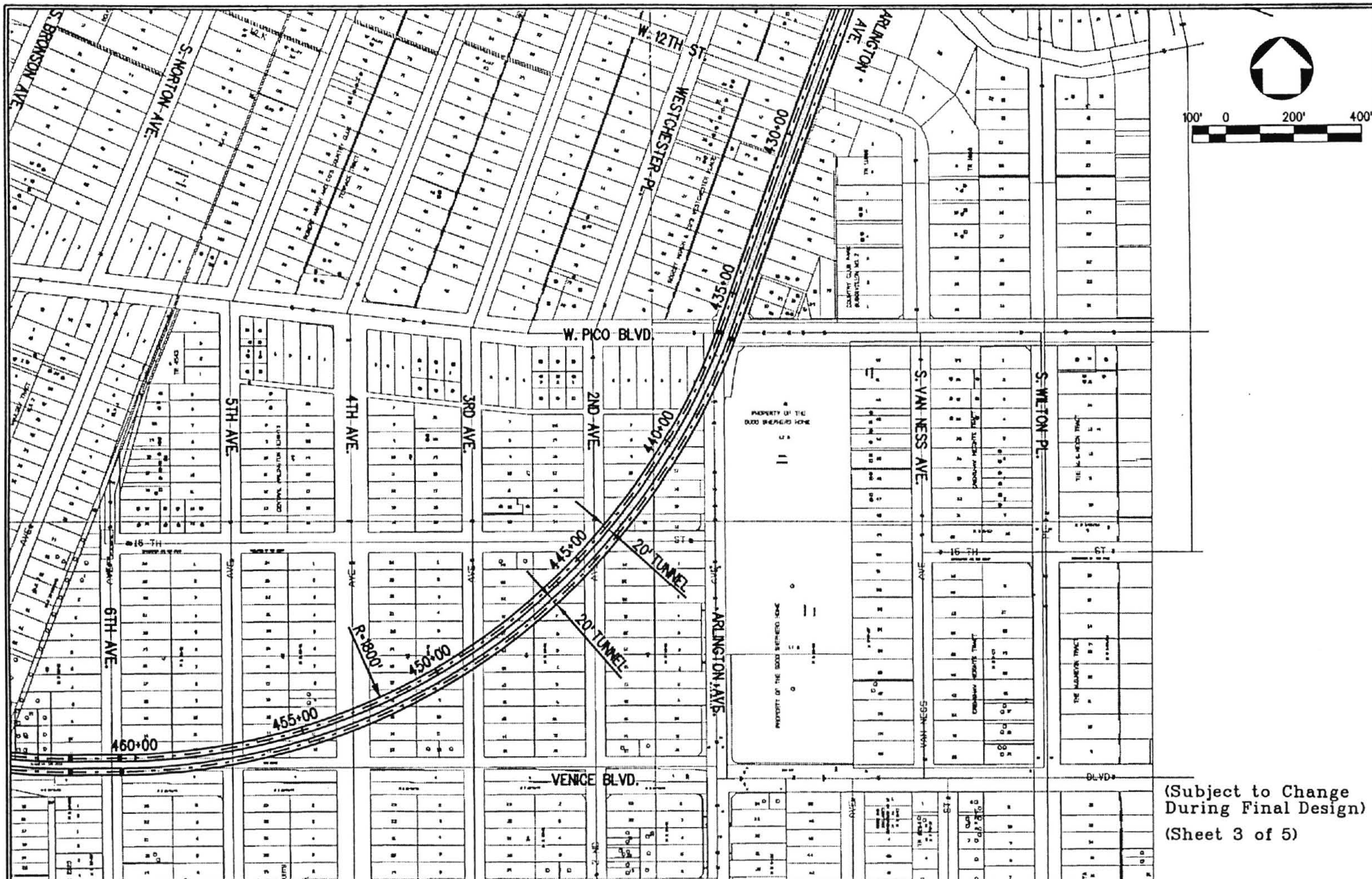

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FIGURE 2-4
WILTON/ARLINGTON/PICO BLVD. APPROACH TO THE VENICE/SAN VICENTE STATION (ALTERNATIVES B1 & B2)

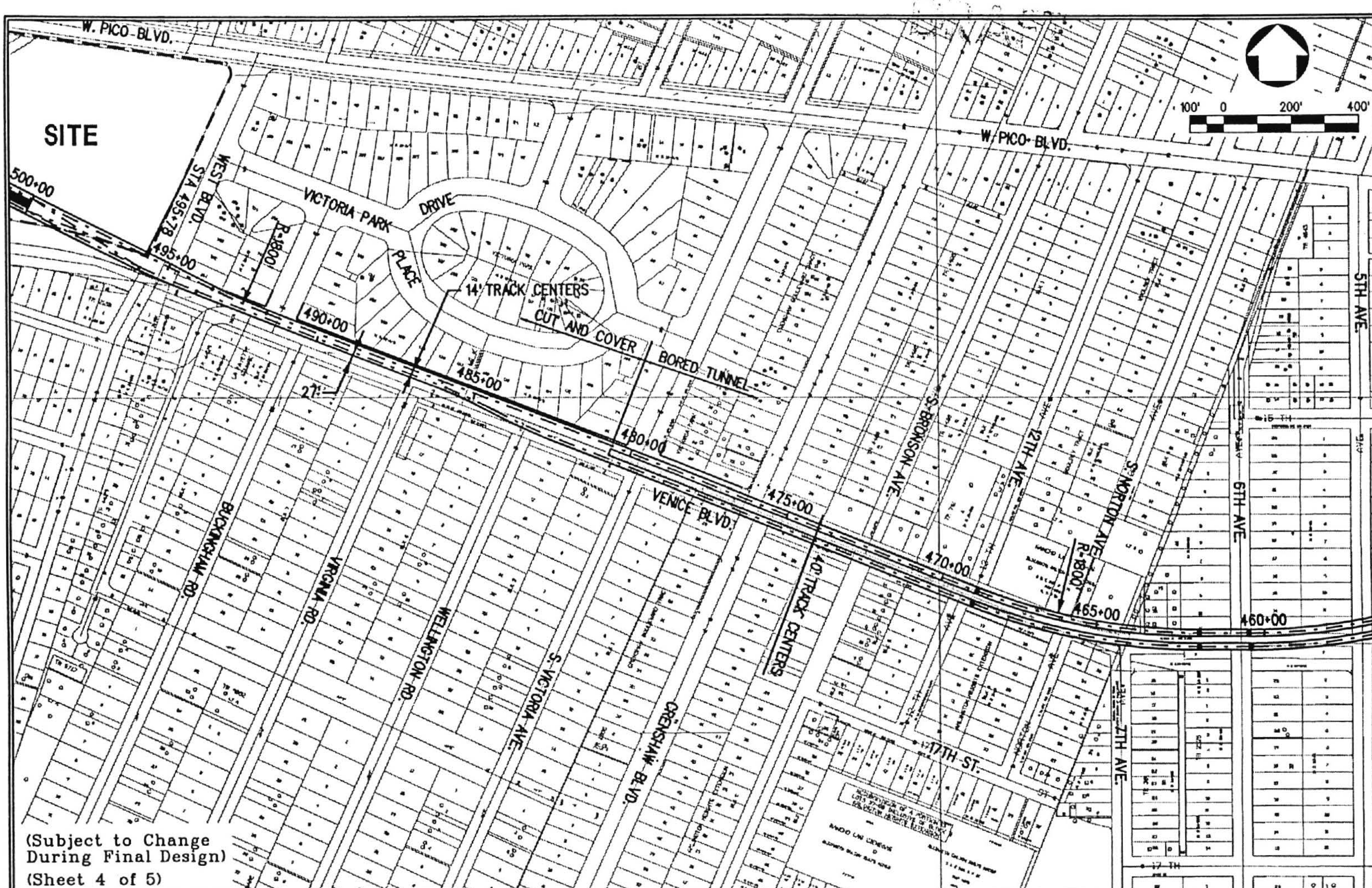
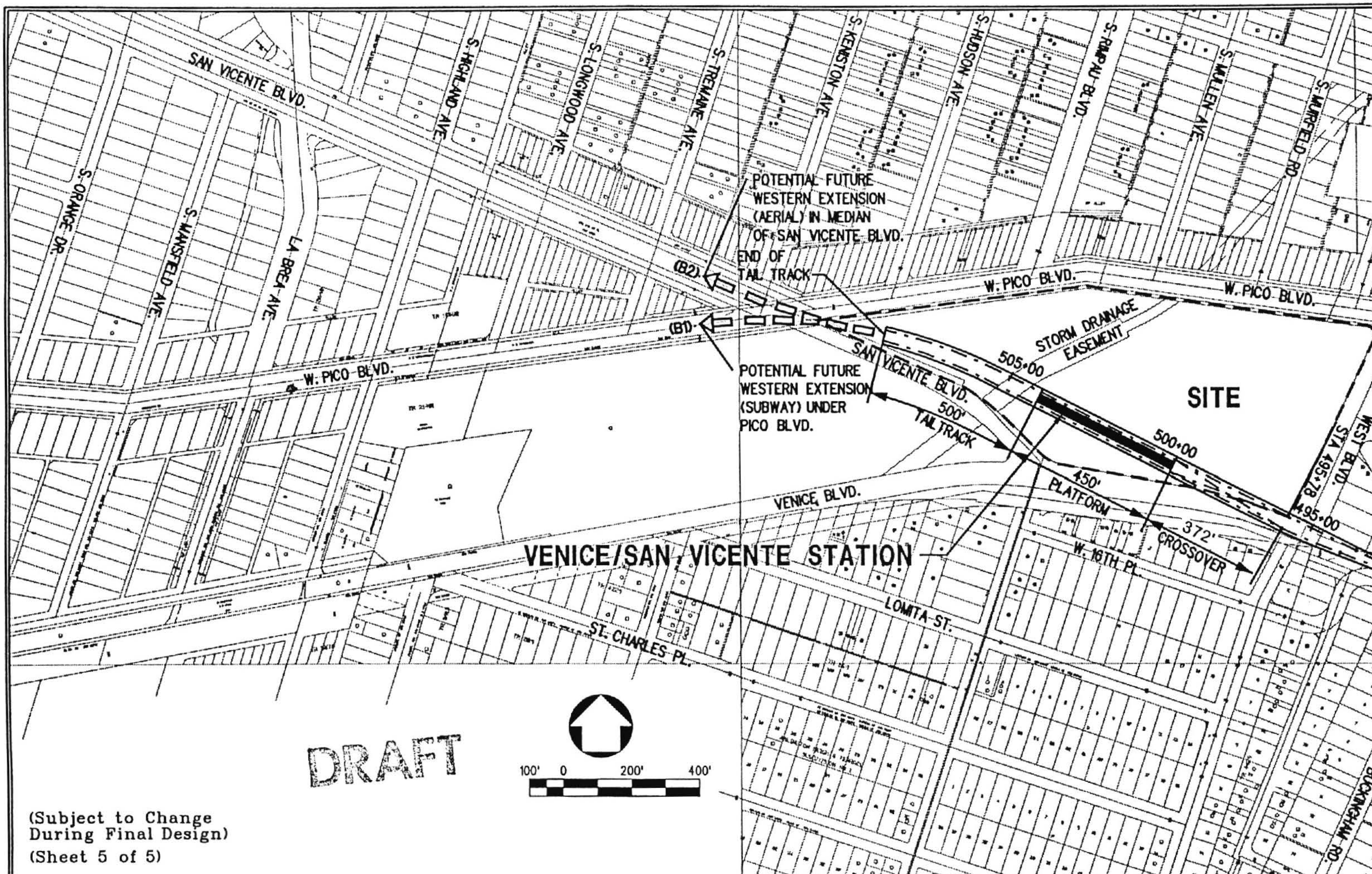


FIGURE 2-4

WILTON/ARLINGTON/PICO BLVD. APPROACH TO THE VENICE/SAN VICENTE STATION (ALTERNATIVES B1 & B2)



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(Sheet 5 of 5)

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FIGURE 2-4
WILTON/ARLINGTON/PICO BLVD. APPROACH TO THE VENICE/SAN VICENTE STATION (ALTERNATIVES B1 & B2)

The depth of the twin deep-bore tunnels would be the same for Alternative B as they would be for Alternative A between the Wilshire/Western Station and Arlington Avenue near Pico Boulevard. South of Pico Boulevard, ~~Alternative B~~ the tunnels would turn in a westerly direction towards Venice Boulevard. The twin deep-bore tunnels would be deepest near the intersection of Venice Boulevard and 4th Avenue. At this point the top of the tunnels would be approximately 60 feet below the surface. The depth of the top of the tunnels at their junction with the cut-and-cover segment near Victoria Avenue would be approximately 54 feet. Between Victoria Avenue and the Venice/San Vicente Station the depth of the concrete box would be slowly reduced until it emerged beyond Venice Boulevard onto the station site immediately west of West Boulevard.

2.4.1 Olympic/Arlington Underground Station

The Olympic/Arlington Underground Station would be constructed in the same manner as described above under Alternative A.

2.4.2 Venice/San Vicente Open Air Station

Alternative B has two construction scenarios for the Venice/San Vicente Station referred to in this document as Alternatives B1 and B2. That portion of the Alternative B alignment between the existing Wilshire/Western Station and the Venice/San Vicente Station site is the same for both the Alternative B1 and B2 station construction scenarios. The purpose for the Alternative B1 and B2 distinction is to environmentally clear Alternative B with two potential construction scenarios for the Venice/San Vicente Station. As such, when Alternative B1 and/or B2 is specifically mentioned in this document it is to clarify which of the construction scenarios is being described for the Venice/San Vicente Station site.

Some further explanation is needed to clarify why Alternative B is being environmentally cleared with two construction scenarios for the Venice/San Vicente Station site. The MTA's current Long Range Transportation Plan describes the Red Line as eventually being extended in a westerly direction from the Pico/ or Venice/San Vicente Station site all the way to a point just west of the I-405 Freeway and Wilshire Boulevard. However, it is not known at this time whether or not it is possible to extend the Red Line in a westerly direction in a subway configuration under Pico Boulevard from the Pico/ or Venice/San Vicente Station site. Preliminary geotechnical testing has indicated that high levels of hydrogen sulfide gas is present at relatively shallow depths in the geological formations immediately west of the Venice/San Vicente Station site. If it is not possible to extend the Red Line as a subway under Pico Boulevard, then another option would be to extend the Red Line in an aerial configuration within the median in San Vicente Boulevard. Additional subsurface gas investigations would be required before the MTA could determine how the Red Line could be extended to the west at some point in the future. Alternative B1 would site the Venice/San Vicente Station at a lower elevation which would allow the Red Line to be extended as a subway under Pico Boulevard at some point in the future. Alternative B2 would site the Venice/San Vicente Station at a higher elevation which would allow the Red Line to be extended in an aerial configuration above San Vicente Boulevard at some point in the future. Once the Venice/San Vicente Station is constructed the future western extension alignment (subway or aerial) would be fixed. Alternative station construction scenarios B1 and B2 are more fully described below.

The entire block bounded by Pico Boulevard on the north, West Boulevard on the east, Venice Boulevard on the south, and San Vicente Boulevard on the west that would be acquired for use as a construction staging area for the construction of this alternative, except for the community pool and the Pico/Rimpau Transit Center. At some point during the construction phase, the Pico/Rimpau Transit Center would have to be demolished and a temporary transit center would have to be set up on the site or in the nearby community. That portion of the construction staging area (not being utilized for station entrance area facilities or other project parking facilities) would be ~~jointly developed~~ available for development (consistent with existing zoning) upon completion of the station construction.

2.4.2.1 Venice/San Vicente Open Air (Lower Elevation) Station (Alternative B1)

The Venice/San Vicente Open Air (Lower Elevation) Station would be a one-level station constructed at an elevation that would place the rails approximately ten feet below the existing grade of the site. The station would have a 450 foot long center-load platform that would be covered by a structure ~~canopy~~. A 372 foot section of crossover track would be located immediately east of the station platform. The tail track would be 500 feet long and it would be constructed within a retained cut. The Alternative B1 station construction scenario would allow for the Red Line to continue in a westerly direction as a subway under Pico Boulevard, should that option be approved at some point in the future. The Venice/San Vicente Open Air (Lower Elevation) Station would provide an enlarged bus transfer facility, a park-and-ride facility with an ultimate capacity of up to 1,000 parking spaces in a multi-level structure, kiss-and-ride facilities, bicycle storage facilities, and convenient/safe pedestrian access. A pedestrian bridge would span the station platform, and connect Venice Boulevard pedestrian walkways and bus stop to the platform and station site. A conceptual site plan for the Venice/San Vicente Open Air (Lower Elevation) Station is provided as Figure 2-5.

~~The entire block bounded by Pico Boulevard on the north, West Boulevard on the east, Venice Boulevard on the south, and San Vicente Boulevard on the west that would be acquired for use as a construction staging area for the construction of this alternative, except for the community pool and the Pico/Rimpau Transit Center. At some point during the construction phase, the Pico/Rimpau Transit Center would have to be demolished and a temporary transit center would have to be set up on the site or in the nearby community. That portion of the construction staging area (not being utilized for station entrance area facilities or other project parking facilities) would be jointly developed available for development (consistent with existing zoning) upon completion of the station construction.~~

2.4.2.2 ~~Wilton/Arlington/Venice Boulevard Approach to~~ Venice/San Vicente Open Air (Higher Elevation) Station (Alternative B2)

The Venice/San Vicente Open Air (Higher Elevation) Station would be a one-level station constructed at an elevation that would place the rails approximately five feet above the existing grade of the site. The station would have a 450 foot long platform that would be covered by a canopy structure. The raised portion of the site would terminate at the western end of the station. A 372 foot section of crossover track would be located immediately east of the station platform. The tail track structures that would extend for 500 feet beyond the station would be supported by columns. The columns would be at a height of at least 16 feet at the western end to accommodate a future western aerial extension. The Alternative B2 station construction scenario would allow for the Red Line to continue in a westerly direction in an aerial alignment along the median within San Vicente Boulevard, should that option be approved at some point in the future. The Venice/San Vicente Open Air (Higher Elevation) Station would provide all of the ridership facilities that would be constructed under Alternative A. Proposed ridership facilities would include an enlarged bus transfer facility, a park-and-ride facility with an ultimate capacity of up to 1,000 parking spaces in a multi-level structure, kiss-and-ride facilities, bicycle storage facilities, and convenient/safe pedestrian access. A pedestrian bridge would span the station platform, and connect Venice Boulevard pedestrian walkways and bus stop to the platform and station site. A conceptual site plan for the Venice/San Vicente Open Air (Higher Elevation) Station is provided as Figure 2-6.

~~The description of Alternative B2's alignment is exactly the same as Alternative B1 except for the Venice/San Vicente Station, which is described below.~~

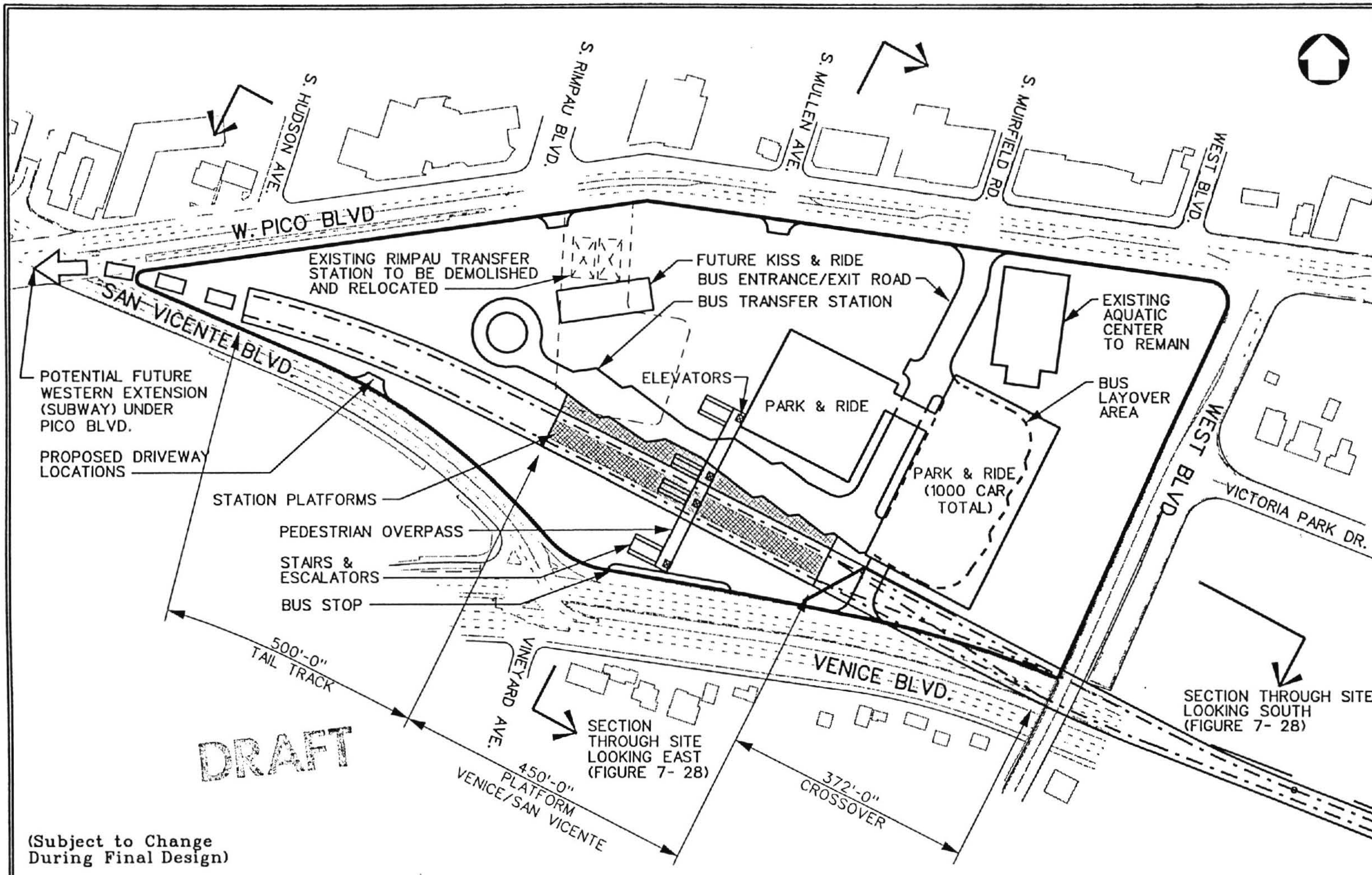

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FIGURE 2-5

CONCEPTUAL SITE PLAN - VENICE/SAN VICENTE OPEN AIR LOWER ELEVATION STATION (ALTERNATIVE B1)

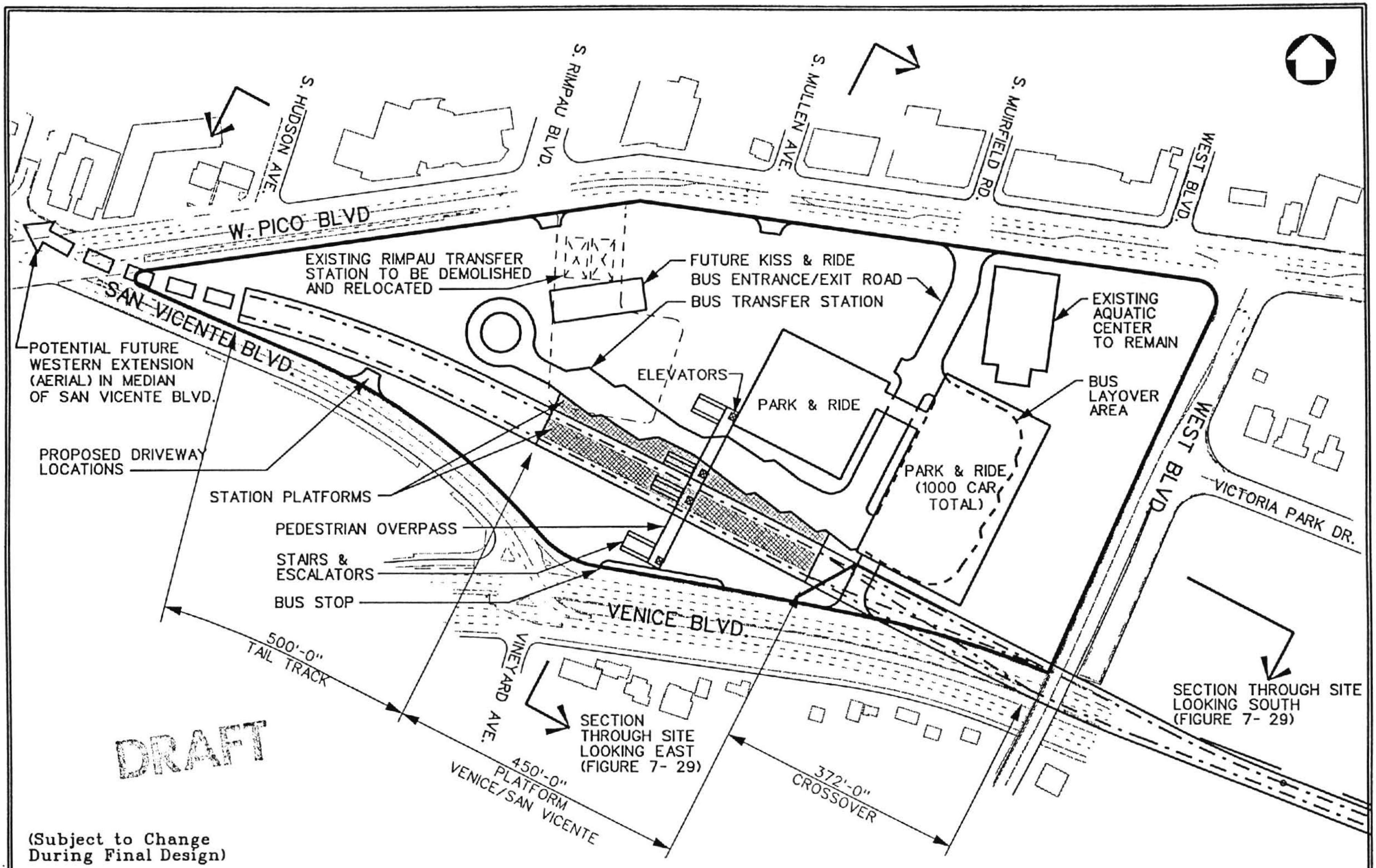

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FIGURE 2-6

CONCEPTUAL SITE PLAN - VENICE/SAN VICENTE OPEN AIR HIGHER ELEVATION STATION (ALTERNATIVE B2)

~~2.5.1 Olympic/Arlington Underground Station~~

~~The Olympic/Arlington Underground Station would be constructed in the same manner as described under Alternative A.~~

~~2.5.2 Venice/San Vicente Open Air (Higher Elevation) Station~~

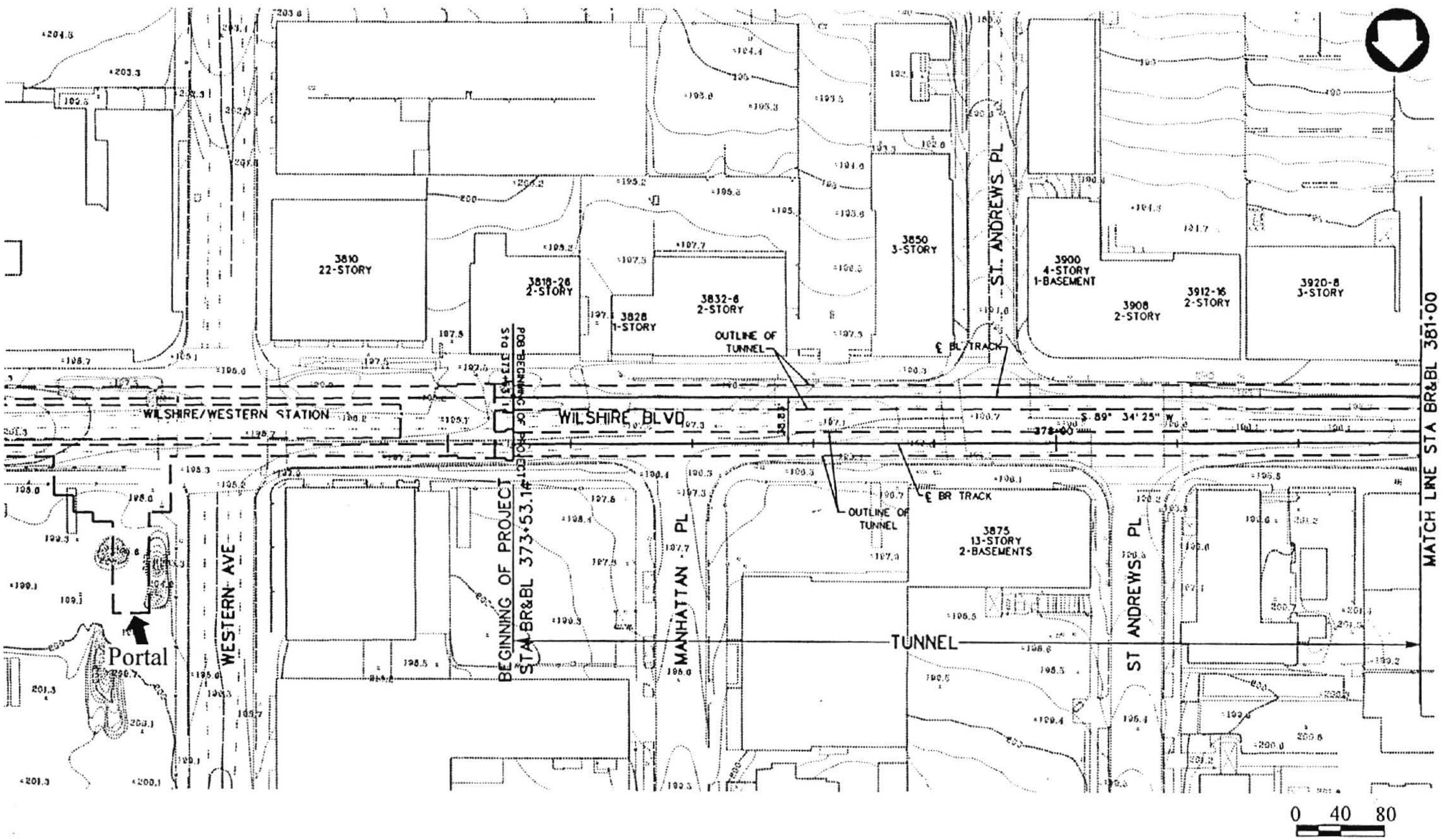
~~Alternative B2 would construct an open-air station . The station would emerge from beyond Venice Boulevard onto the property north of Venice Boulevard at an elevation that would place the rails approximately 5 feet above the existing grade. The station platform would be approximately 450 feet long, and it would be protected by a canopy structure. The raised portion of the site would terminate at the western end of the station. A 372 foot section of crossover track would be located immediately east of the station platform. The tail track structures that would extend for 500 feet beyond the station would be supported by columns. The columns would be at a height of at least 16 feet at the western end to accommodate a future western aerial extension. The Alternative B2 station construction scenario would allow for the Red Line to continue in a westerly direction in an aerial alignment along the median within San Vicente Boulevard, should that option be approved at some point in the future. The Venice/San Vicente Open Air (Higher Elevation) Station would provide all of the ridership facilities that would be constructed under Alternatives A and B1. Proposed ridership facilities would include an enlarged bus transfer facility, a park-and-ride facility with an ultimate capacity of up to 1,000 parking spaces in a multi-level structure, kiss-and-ride facilities, bicycle storage facilities, and convenient/safe pedestrian access. A pedestrian bridge would span the station platform, and connect Venice Boulevard pedestrian walkways and bus stop to the platform and station site. A conceptual site plan for the Venice/San Vicente Open Air (Higher Elevation) Station is provided as Figure 2-6.~~

2.5 Crenshaw Boulevard/Pico Boulevard Approach to Pico/San Vicente Underground Station (Alternative C)

Alternative C is a proposed 2.3-mile, two-station, extension of the existing Metro Red Line that would follow the same horizontal alignment as the original LPA. As shown in Figure 2-7, the alignment would extend from the existing Wilshire/Western Station and travel west along Wilshire Boulevard, south along Crenshaw Boulevard, and west along Pico Boulevard. It would include a shallow one-level underground station immediately south of Olympic Boulevard under Crenshaw Boulevard (Olympic/Crenshaw Station) and a one-level underground terminus station south of Pico Boulevard just east of San Vicente Boulevard (Pico/San Vicente Underground Station).

The Alternative C alignment would be shallower than the alignment analyzed in the 1992 SEIS/SEIR. The Alternative C alignment would proceed in a westerly direction from the existing Wilshire/Western Station, with the top of the tunnel at a depth of about 35 feet below the ground surface. Near Norton Avenue, the alignment would curve in a southwesterly direction towards Crenshaw Boulevard. Continuing south beneath Crenshaw Boulevard, the depth of the tunnel would decrease to about 30 feet north of 8th Street.

Twin, bored tunnels would be constructed from the Wilshire/Western Station to a point north of 8th Street. Cut-and-cover construction methods would be required from just north of 8th Street to a point about 1,100 feet south of Country Club Drive. The total length of the cut-and-cover within Crenshaw Boulevard would be 3,700 feet. Within this cut-and-cover segment an underground station would be constructed immediately south of the intersection of Olympic and Crenshaw. This station would be serviced by entrances located on each side of Crenshaw Boulevard. Along this cut-and-cover segment, the tunnel would be just below the street surface. South of the Olympic/Crenshaw Underground Station the alignment would continue as a cut-and-cover tunnel until south of Country Club Drive, where the alignment would continue as a deep-bored tunnel, and curve



(Sheet 1 of 11)
(Subject to Change)
(Source: Engineering Management Consultant, 1995)

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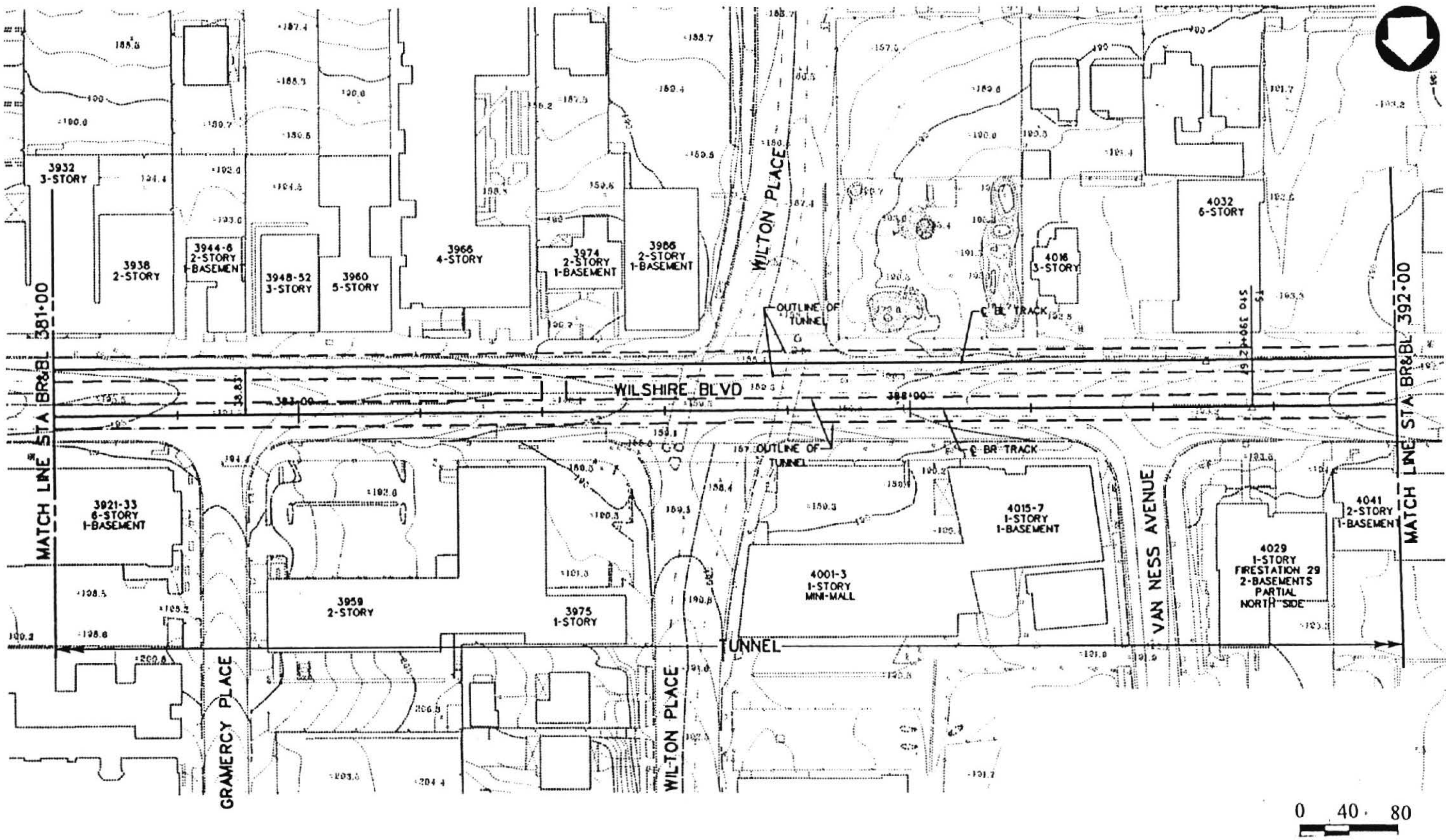
FIGURE 2-7
CRENSHAW/PICO BOULEVARDS APPROACH TO THE PICO/SAN VICENTE STATION (ALTERNATIVES C)



(Sheet 2 of 11)
(Subject to Change)
(Source: Engineering Management Consultant, 1995)

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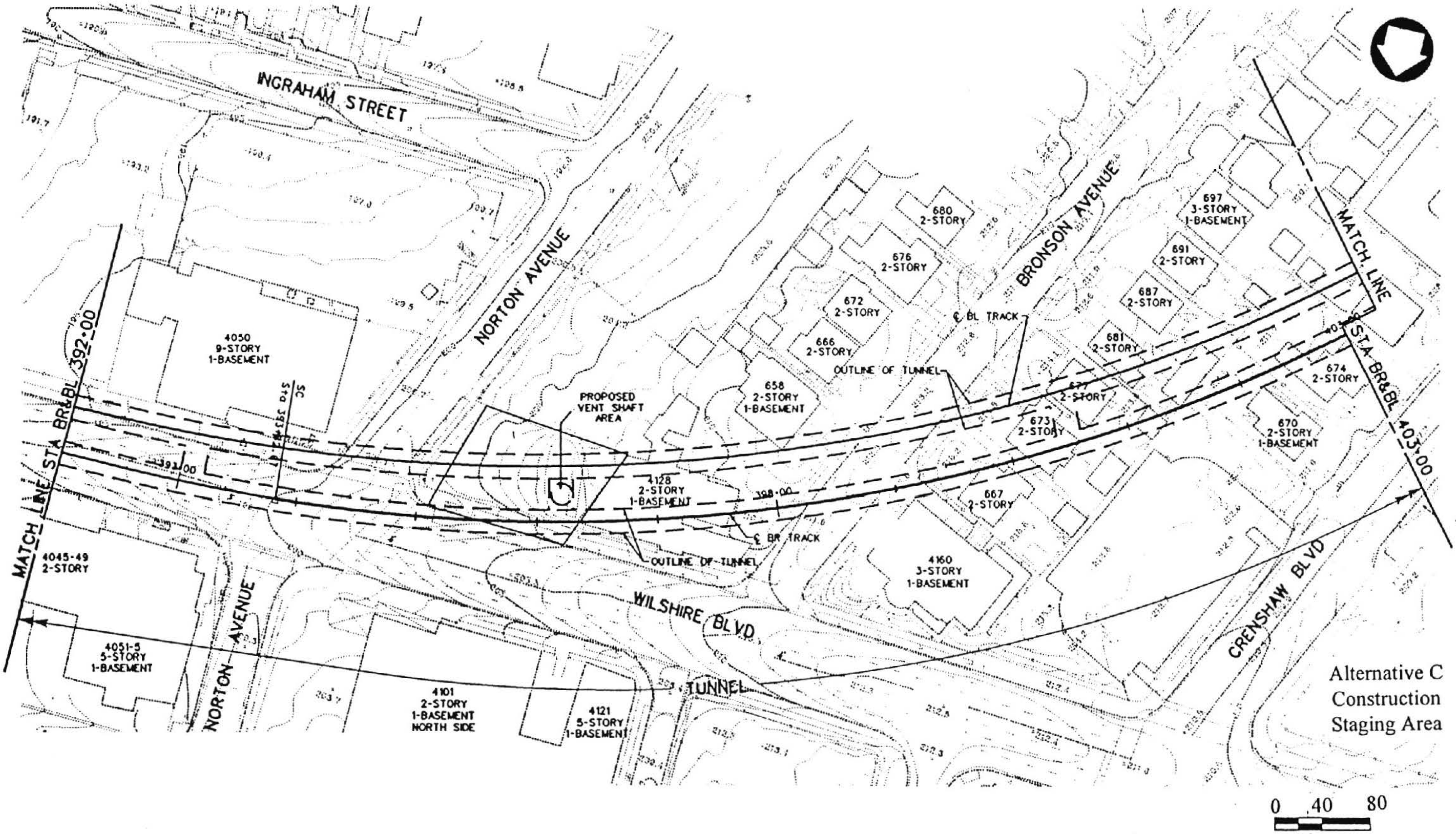
FIGURE 2-7
CRENSHAW/PICO BOULEVARDS APPROACH TO THE PICO/SAN VICENTE STATION (ALTERNATIVES C)



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(Subject to Change)
(Source: Engineering Management Consultant, 1995)

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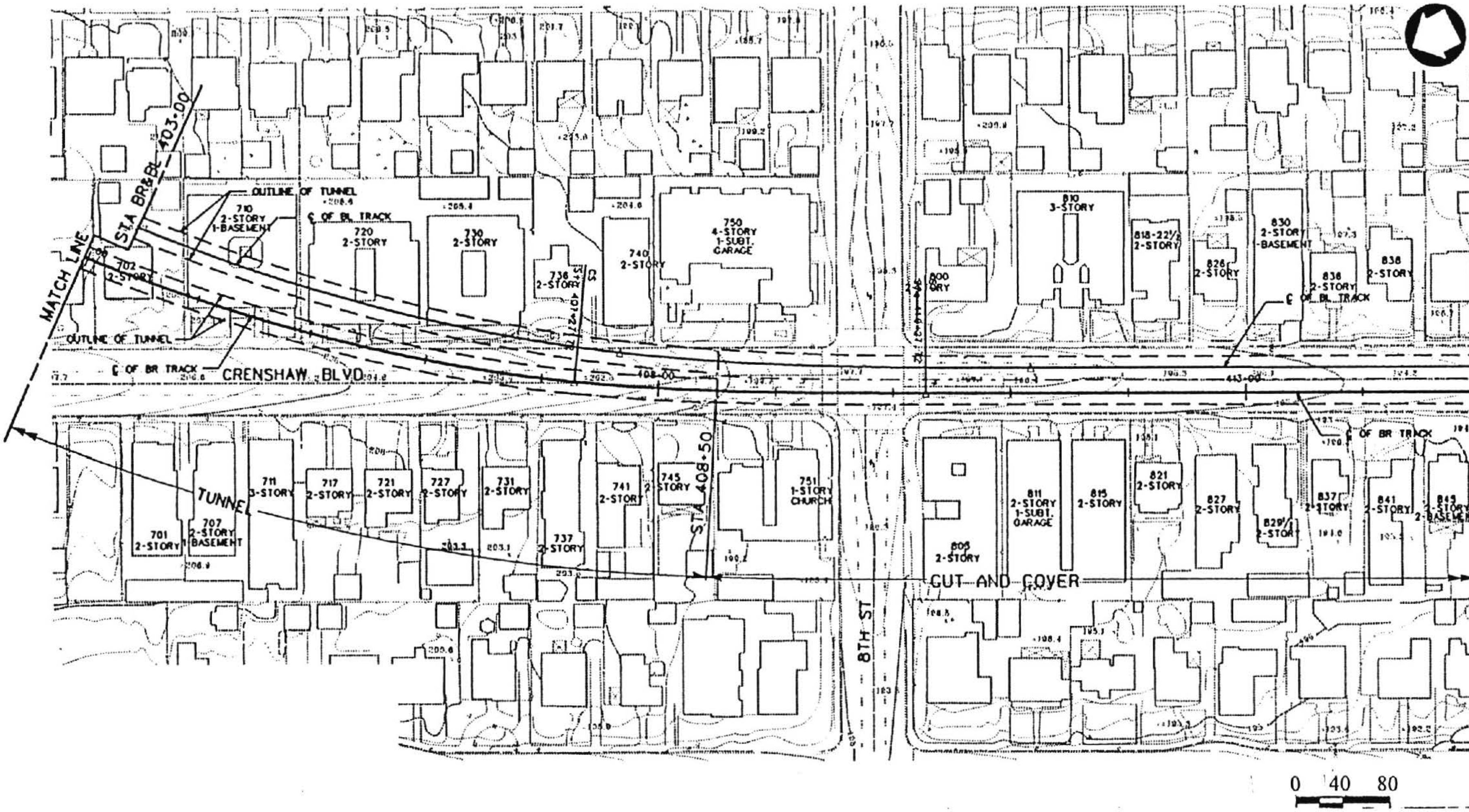
FIGURE 2-7

CRENSHAW/PICO BOULEVARDS APPROACH TO THE PICO/SAN VICENTE STATION (ALTERNATIVES C)



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(Subject to Change)
(Source: Engineering Management Consultant, 1995)

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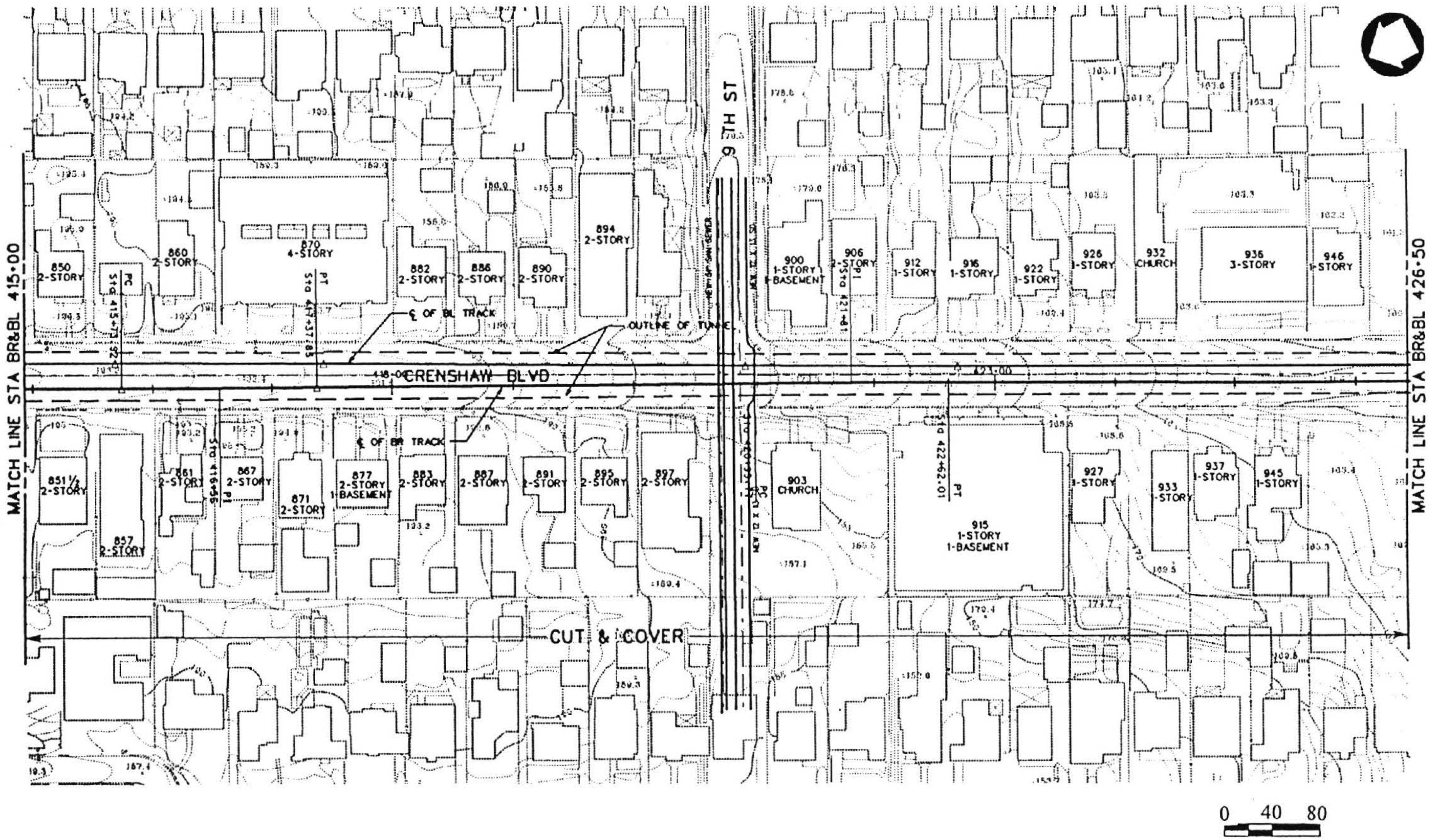
FIGURE 2-7
CRENSHAW/PICO BOULEVARDS APPROACH TO THE PICO/SAN VICENTE STATION (ALTERNATIVES C)



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(Subject to Change)
(Source: Engineering Management Consultant, 1995)

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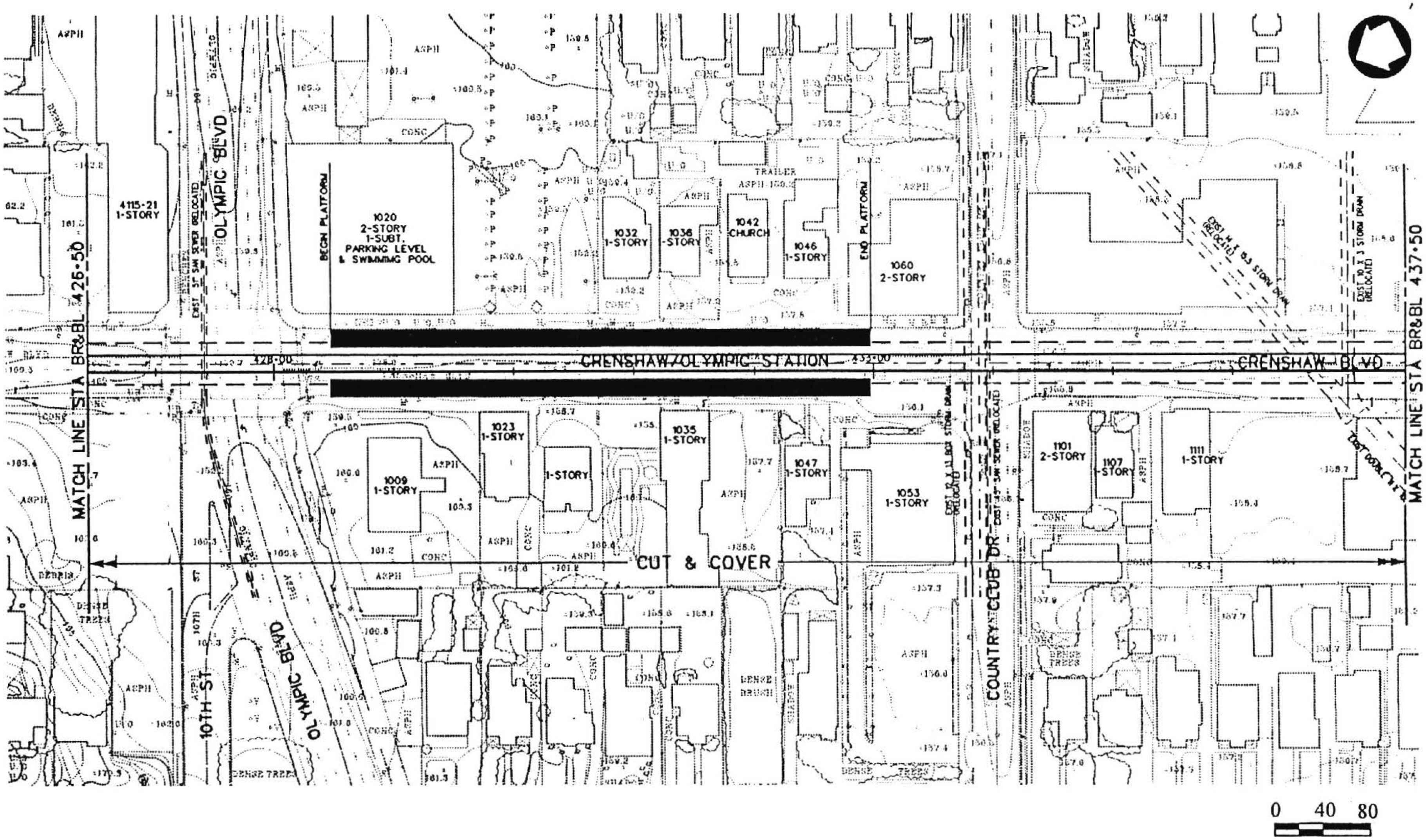
FIGURE 2-7
CRENSHAW/PICO BOULEVARDS APPROACH TO THE PICO/SAN VICENTE STATION (ALTERNATIVES C)



(Sheet 6 of 11)
(Subject to Change)
(Source: Engineering Management Consultant, 1995)

(Station Entrance Areas Shown on Figure 2-8)

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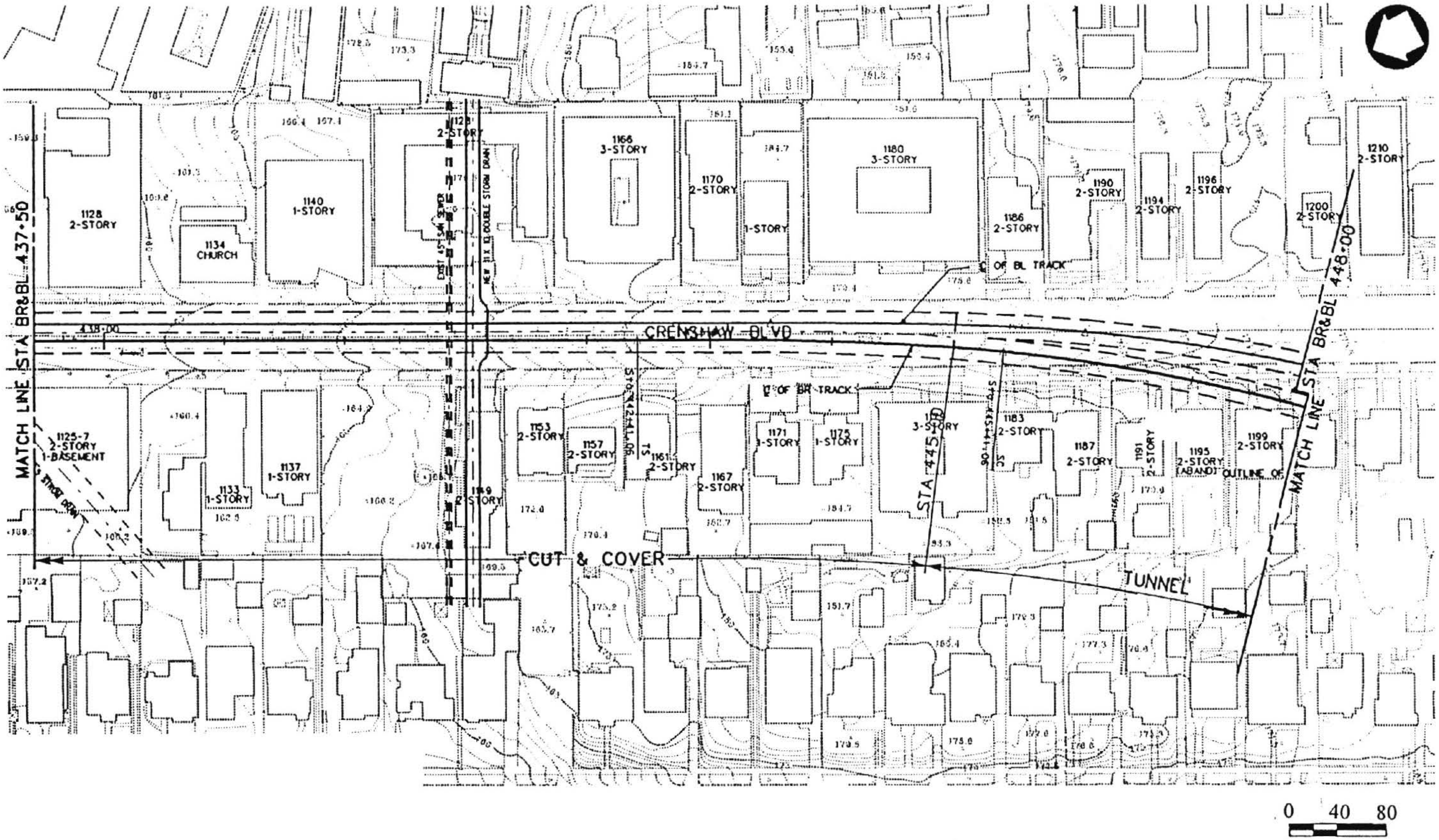
FIGURE 2-7
CRENSHAW/PICO BOULEVARDS APPROACH TO THE PICO/SAN VICENTE STATION (ALTERNATIVES C)



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(Subject to Change)
(Source: Engineering Management Consultant, 1995)

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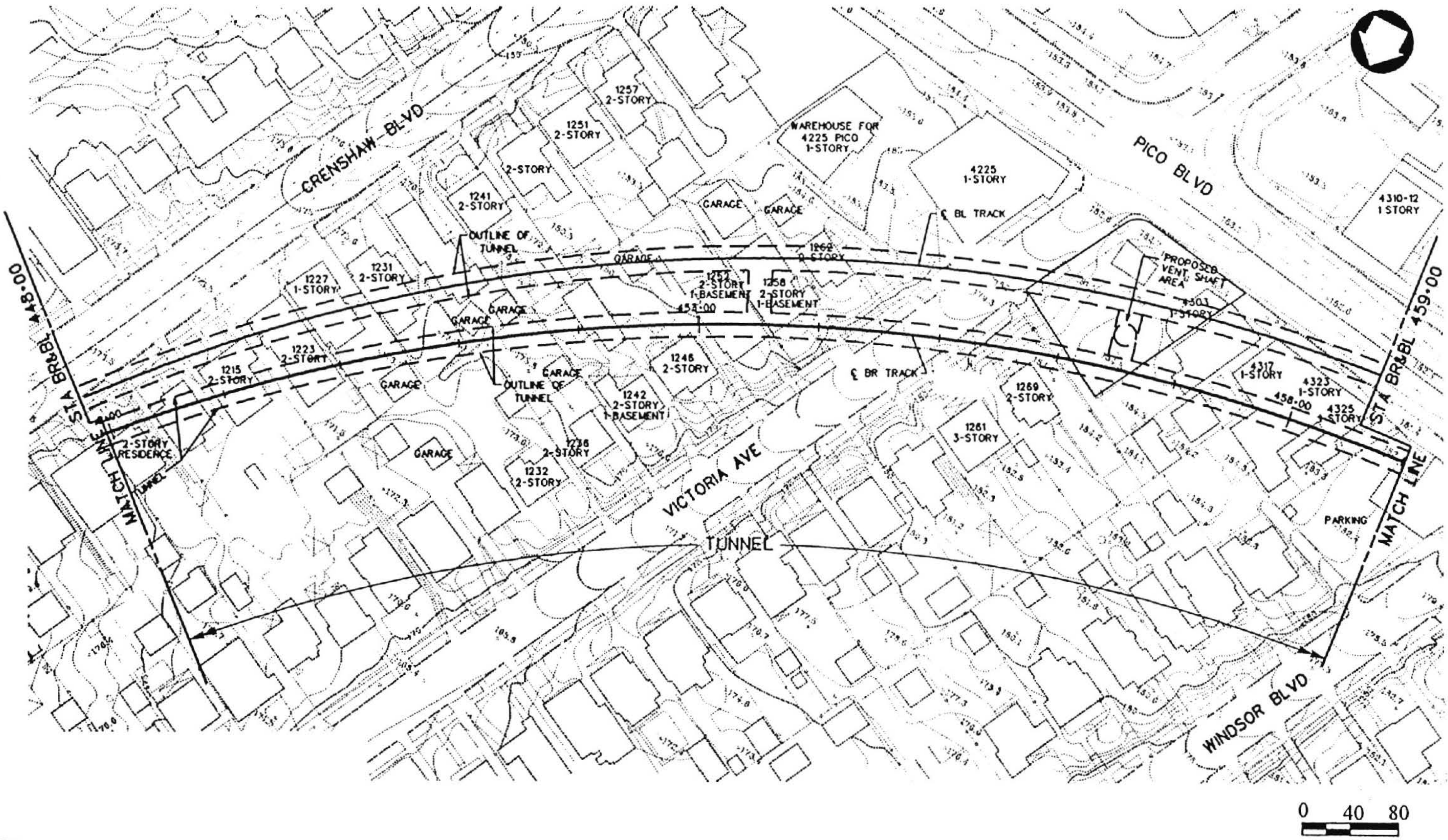
FIGURE 2-7
CRENSHAW/PICO BOULEVARDS APPROACH TO THE PICO/SAN VICENTE STATION (ALTERNATIVES C)



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(Subject to Change)
(Source: Engineering Management Consultant, 1995)

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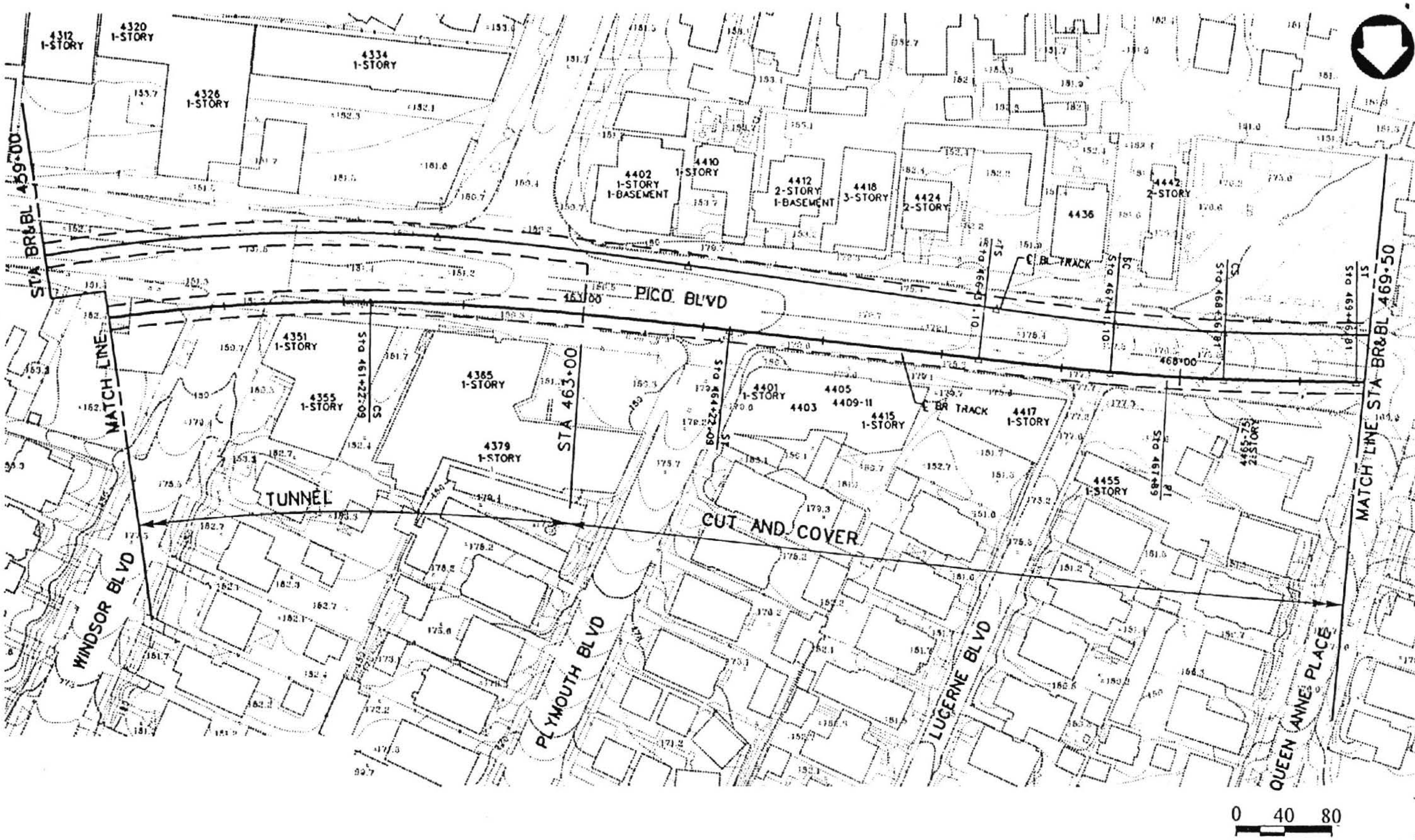
FIGURE 2-7
CRENSHAW/PICO BOULEVARDS APPROACH TO THE PICO/SAN VICENTE STATION (ALTERNATIVES C)



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(Subject to Change)
(Source: Engineering Management Consultant, 1995)

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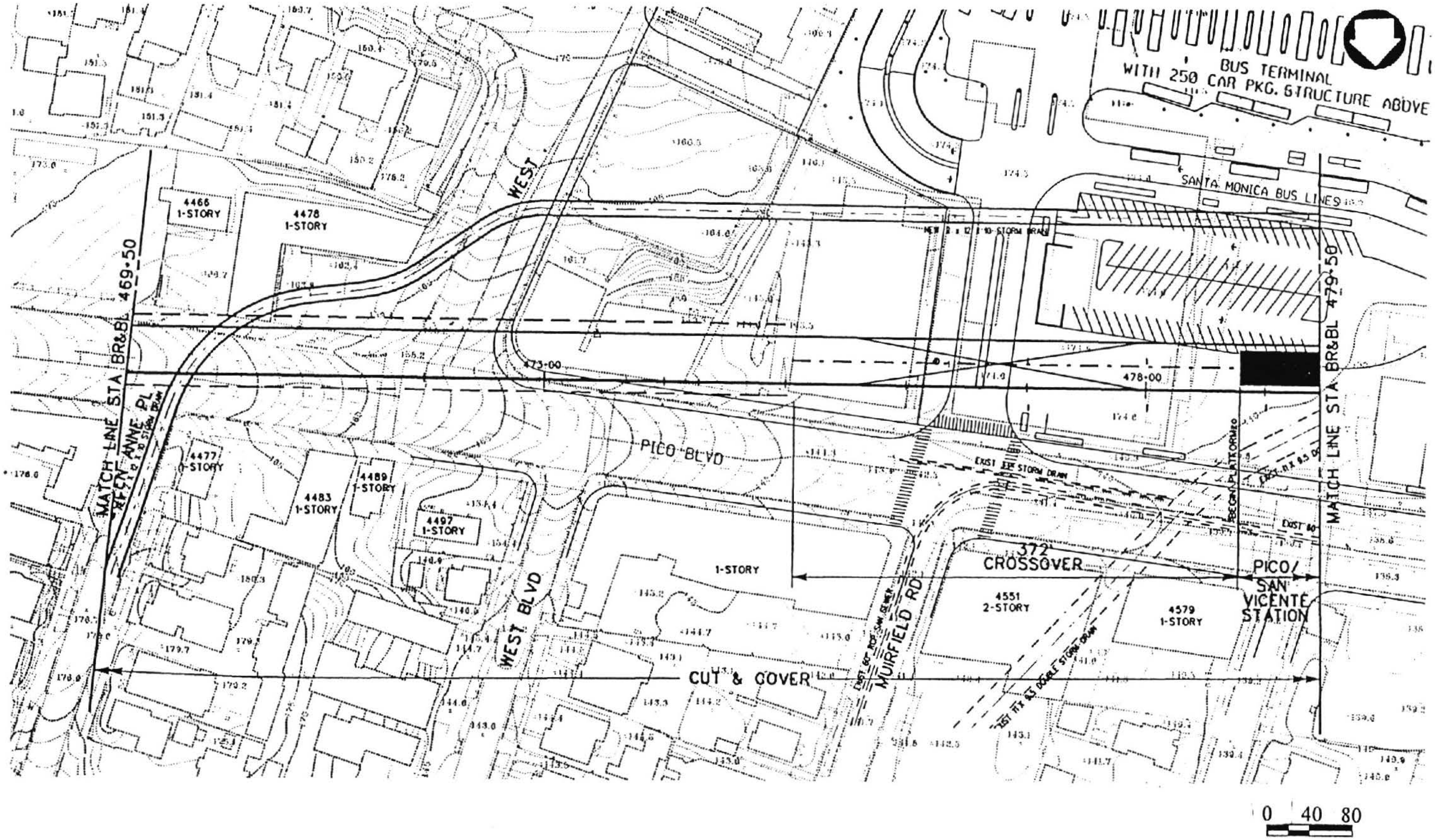
FIGURE 2-7
CRENSHAW/PICO BOULEVARDS APPROACH TO THE PICO/SAN VICENTE STATION (ALTERNATIVES C)



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(Source: Engineering Management Consultant, 1995)

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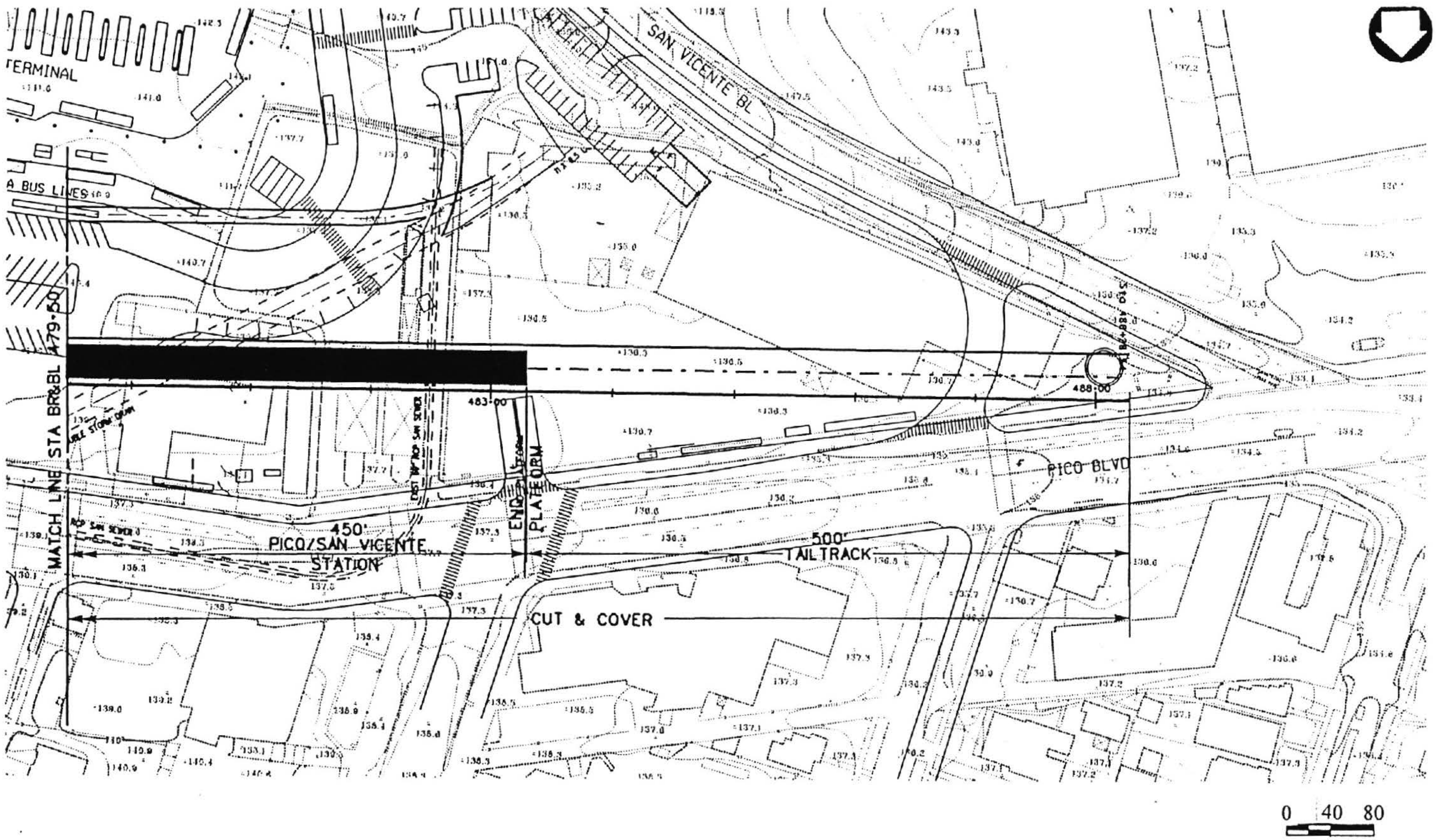
FIGURE 2-7
CRENSHAW/PICO BOULEVARDS APPROACH TO THE PICO/SAN VICENTE STATION (ALTERNATIVES C)



(Sheet 11 of 11)
(Subject to Change)
(Source: Engineering Management Consultant, 1995)

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FIGURE 2-7
CRENSHAW/PICO BOULEVARDS APPROACH TO THE PICO/SAN VICENTE STATION (ALTERNATIVES C)

beneath private property towards Pico Boulevard. This descent, along with rising ground elevations south of Olympic Boulevard, would result in a tunnel depth of 25 to 35 feet, between the surface of the ground and the top of the tunnels. Between Victoria Avenue and the Pico/San Vicente Underground Station site the same cut-and-cover construction method described for Alternative A above would be used. As the subway continued west beneath Pico Boulevard, its depth would decrease as it approached the Pico/San Vicente Underground Station site.

Alternative C would require two air movement facilities to circulate air through the tunnels. During project construction, ventilation air from the tunnel face, or from the station excavation, would be carried through ducts to the air system by fans. During operation, ventilated air from the tunnel may be treated as well by this method.

A ventilation structure would be constructed at the approximate mid-point between the Olympic/Crenshaw and Wilshire/Western stations. A final location for this ventilation shaft will be selected during final design. For purposes of this document, it is assumed that the ventilation shaft would be located at the southwest corner of Norton Avenue and Wilshire Boulevard. The location of this vent shaft is shown on Sheet 3 of 11 in Figure 2-7. A second vent shaft is proposed for the northwest corner of Pico Boulevard and Victoria Avenue, between the Olympic/Crenshaw Station and the Pico/San Vicente Station. The location of this vent shaft is shown on Sheet 8 of 11 in Figure 2-7.

2.5.1 Olympic/Crenshaw Underground Station

The Olympic/Crenshaw Station would use a single-level, side platform design. At the Olympic/Crenshaw Station, the entrance to the outbound tracks would be located at the southwestern corner of the Olympic/Crenshaw intersection. The entrance to the inbound tracks would be located at the northeastern corner of the intersection (see Figure 2-8). These entrances would be placed within plaza areas. Ticket vending machines would be located at each entrance to this station.

The Pico/San Vicente Underground Station, an interim terminus station, would be a one-level station, with a 450 foot long platform, and a tail track of 500 feet. The depth of the station would be approximately 40 feet, and the top of the station would be just below the surface.

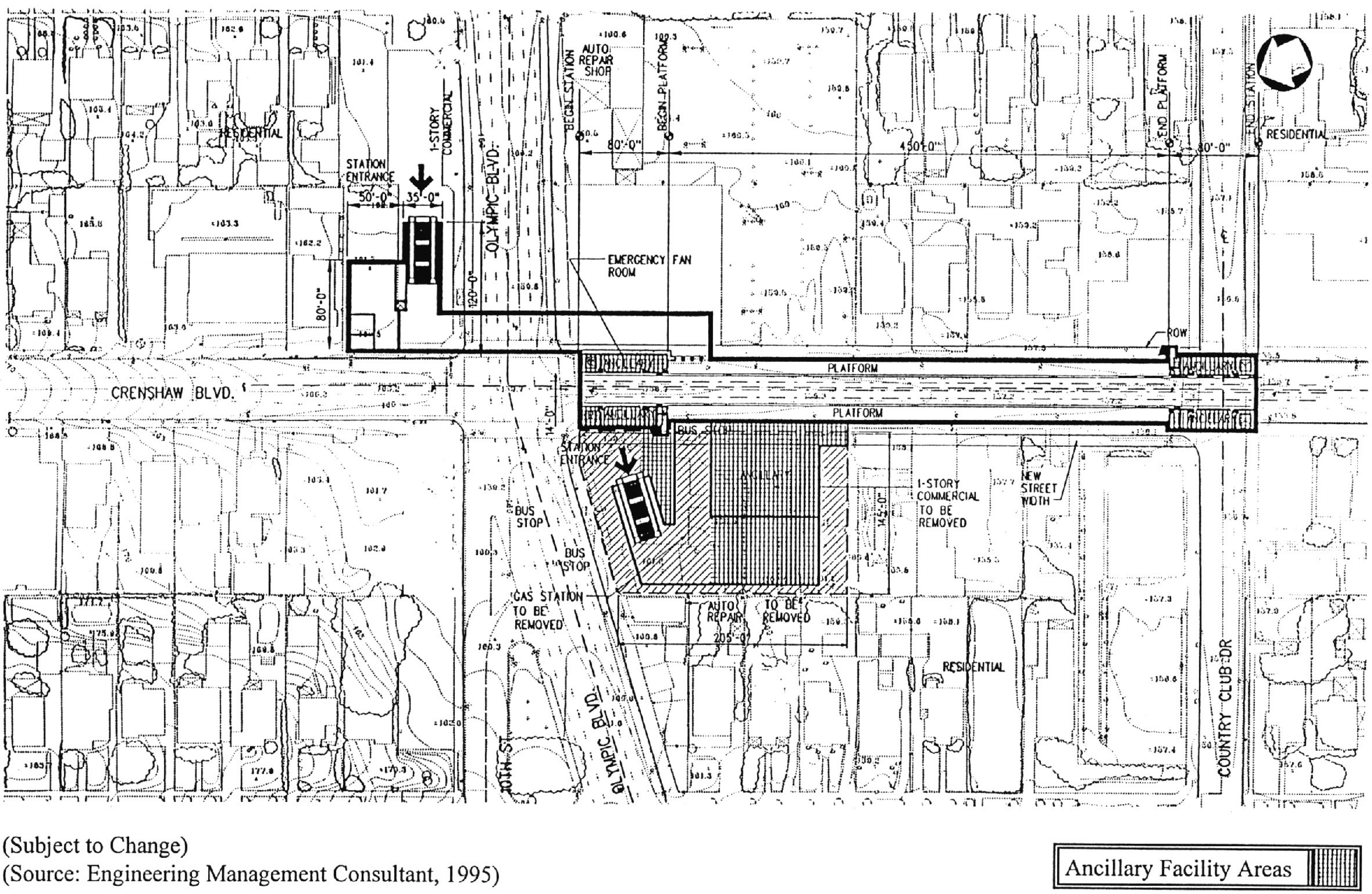
2.5.2 Pico/San Vicente Underground Station

The approach and design of the Pico/San Vicente Underground Station is the same as Alternative A (see Section 2.3.2).

2.6 Other Alternatives Considered But Not Analyzed

2.6.1 Wilshire Boulevard Alignment

The original LPA for the Metro Red Line included an underground alignment along Wilshire Boulevard from the Los Angeles Central Business District west to Fairfax Avenue. MTA adopted this LPA after completion of the 1983 EIS/EIR. In 1985, a fire occurred at the Ross Dress-for-Less Store on Third Street east of Fairfax Avenue. A City of Los Angeles Task Force determined the source of the fire to be naturally-occurring underground methane gas that seeped into a confined area of the building with no ventilation. A spark caused the explosion and fire. In its report on the fire, the Task Force identified specific risk zones related to detection of methane gas.



(Subject to Change)
(Source: Engineering Management Consultant, 1995)

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FIGURE 2-8
CONCEPTUAL SITE PLAN FOR THE OLYMPIC/CRENSHAW STATION (ALTERNATIVES C)

In December 1985, the United States Congress passed Public Law No. 99- 1980, which stipulated that federal funds could not be used to tunnel into or through the area identified as potential "risk" or "high risk" in the June 1985 City of Los Angeles report regarding the methane fire in the Fairfax area. Because of this prohibition and the need for federal funding for this project, the Underground Alternative along Wilshire Boulevard was rejected.

Given the prohibition to tunnel within the methane risk zone, an aerial alternative along Wilshire Boulevard was considered in the 1987 Draft SEIS/SEIR. It was determined in the 1987 Draft SEIS/SEIR that an aerial alternative would result in significant environmental impacts and issues, including: the loss of a traffic lane and the on-street parking on a major city thoroughfare, visual effects, and impacts on historic structures and a historic district and related Section 4(f) issues. There was substantial public opposition to an aerial structure along Wilshire Boulevard.

2.6.2 Crenshaw/Pico Aerial Stations

The Aerial Stations Alternative includes a raised vertical alignment in and around station areas (see Figure 2-10 and Figure 2-11 included in Appendix E).

This alternative would have the same horizontal alignment as the 1992 LPA from its eastern end at the Wilshire/ Western Station to beneath Crenshaw Boulevard around 9th Street. Along Crenshaw Boulevard in the vicinity of 9th Street, the ground surface begins to slope down towards Olympic Boulevard. At this point, the Aerial Stations Alternative would begin a gradual incline. The top of the tunnel would reach the ground surface in the center of Crenshaw Boulevard south of 9th Street, about 400 feet north of Olympic Boulevard.

Transition structures for the aerial portions of this alignment would support the guideway as it gradually rose from the ground to an ultimate clearance of 16.5 feet (clearance refers to the distance from ground surface to the bottom of the supporting structure). From the location where it breaches the ground surface, each transition area would begin as a continuation of the concrete tunnel walls and roof. As the guideway rose, the roof would be eliminated and the height of concrete side walls would be reduced. The two transition structures would end at abutments north of Olympic Boulevard and south of Country Club Drive.

Two station entrances would be provided for the Olympic/Crenshaw Aerial Station. An entrance at the southwestern corner of the intersection would provide access to the outbound tracks and an entrance at the northeastern corner of the Olympic/Crenshaw intersection would provide access to the inbound tracks.

Transition structures would occupy a 33-foot-wide space in the center of Crenshaw Boulevard. Northbound and southbound traffic lanes of Crenshaw Boulevard would be reconfigured to curve around these structures and alongside a 33-foot-wide center median between the two transition structures. Streets would be widened, as necessary, per City of Los Angeles requirements. Crenshaw Boulevard would be rebuilt where possible with the current number of traffic and parking lanes. Maintaining the street capacity for the entire span (approximately one-half mile) along Crenshaw Boulevard would have required acquisition of a substantial number of properties on both sides of Crenshaw Boulevard.

South of the transition area near Country Club Drive, the alignment would return to an underground configuration. A short segment of the tunnel in this location would require cut-and-cover construction. The subway would curve in a bored tunnel from Crenshaw Boulevard to Pico Boulevard. The curved tunnel segment would cross to the south side of Pico Boulevard.

From this point, the alignment would continue west along the south side of Pico Boulevard, across West Boulevard, and into the Pico/San Vicente station site. This would require acquisition of property on the south side of Pico Boulevard. The top of the tunnel would reach ground surface just west of Plymouth Boulevard. The guideway would gradually rise to achieve a clearance of 16.5 feet as the aboveground structure crosses West Boulevard and enters the Pico/San Vicente station site. East of West Boulevard the guideway would be supported with the use of berms and retaining walls.

The line segment within the station site, which would include a crossover, station platform, and 500-foot tail track, would be supported on columns within the station site. Due to sharp decreases of existing natural grade within the site and the need to maintain fairly level trackage within this segment, the distance between the existing natural grade and the bottom of the structure would increase.

The total height of the Pico/San Vicente aerial station above the existing grade would reach about 45 to 48 feet.

This alternative was dropped from further consideration because of numerous issues which included, but were not limited to, excessive amounts of right-of-way acquisitions that would have been required, visual impacts, noise issues associated with traffic on Crenshaw Boulevard and the effects on adjacent residential units, and the amount of commercial frontage that would have been displaced.

2.6.3 Off-Street Alignments Along Crenshaw Boulevard With Aerial Station

Early in the engineering design stage it became apparent that to accommodate transition structures associated with the aboveground Olympic/Crenshaw Station and retain the same width of Crenshaw Boulevard, property acquisitions would be required along both sides of Crenshaw Boulevard from north of 9th Street to south of Country Club Drive. This observation led to the consideration of modified alternatives that would be partially or fully offstreet in order to reduce the requirements for property acquisitions in this area. Three alternatives with modified horizontal alignments were reviewed: a fully off-street alignment, a partially off-street alignment, and a diagonal alignment across Crenshaw Boulevard. In addition, other variations that became available with an off-street alignment, such as an open trench and berm configuration, were also reviewed.

All of these alternatives were rejected, primarily because of the substantial amounts of property acquisitions that would have been required, and because of the potential operational problems associated with sharp curves in the alignments.

2.6.4 Western Avenue Alignment

Members of the community that did not want the subway alignment to go down Wilton Place/Arlington Avenue suggested that Western Avenue could be a potential alternative route. They suggested that the subway alignment could go south on Western Avenue to the I-10 Freeway and then follow the alignment of the freeway to a point west of the I-405 Freeway. While on the surface a Western Avenue alignment might seem feasible, it is not feasible for the following reasons:

- The existing tail track that services the Wilshire/Western Station extends approximately ½ block west of Western Avenue under Wilshire Boulevard (See Figure 2-7, Sheet 1 of 11).
- Extending the existing track to Western Avenue would create a large "S" shaped curve that would go under many properties south of Wilshire Boulevard and east of Wilton Place.
- This additional distance would be very costly.
- The trains would have to travel at reduced speeds during the "S" curve, thereby extending travel times.

- In the MTA's Long Range Transportation Plan, the western extension of the Red Line is identified as an east/west corridor between downtown Los Angeles and the west-side. A Western Avenue detour of the western extension of the Red Line would eliminate the east/west movement of passengers and replace it with a north/south movement.

Members of the community also suggested that the Red Line could be terminated at the existing Wilshire/ Western Station and that another rail line could be constructed under Western Avenue. This would be a very expensive alternative for the following reasons:

- It would require another rail yard for another operating line.

- It would require building another station adjacent to the existing Wilshire/Western Station.

- It would require an additional transfer of patrons.

- A goal of the Red Line subway system is to provide quick and convenient service to its patrons to serve the broader "Wilshire Corridor" in an east/west direction. This goal would not be met as successfully with this alternative.

~~The western extension of the Red Line has always been identified as an east/west corridor. A Western Avenue detour of the western extension of the Red Line would eliminate the east/west movement of passengers and replace it with a north/south movement. If it were to turn south, it would need to turn west as soon as possible to serve the original intended corridor. However, continuation of the Red Line south along Western Avenue would require either a large loop under many more residential properties than currently proposed because the Red Line already extends one-half block beyond Western Avenue, beneath Wilshire Boulevard; or it would require terminating the Red Line at the existing Wilshire/Western Station and building another rail line under Western Avenue. This new rail line would require another rail yard for another operating line, and it would require an additional transfer of patrons. A goal of the Red Line subway system is to provide quick and convenient service to its patrons to serve the broader "Wilshire Corridor" in an east/west direction. This goal would not be met as successfully with this alternative.~~

3.0 OPERATIONAL CHARACTERISTICS

3.1 Patronage

For purposes of the environmental impact analyses in this SEIS/SEIR, patronage estimates used in previous environmental documents were updated in light of a new analysis year (2020 rather than 2010) and MTA's current Long Range Transportation Plan (LRTP). Patronage modeling efforts conducted for the LRTP provide assumptions for impact analysis in technical areas such as traffic and air quality. Assumptions underlying the LRTP patronage projections assumed the following:

- Southern California Association of Governments (SCAG) population projections for the year 2020 (these were completed in April 1994 and are based on the 1990 Census);
- Current inventory of projects that are built, under construction, or funded;
- SCAG's parking cost assumptions (current cost in constant dollars);
- Constant countywide bus fleet;
- Current bus system network with minor adjustments in routes to feed stations;
- Current automobile operating costs in constant dollars;
- SCAG's person-trip assumptions (work trips are calibrated to 1990 Census patterns); and
- MTA's policy decision regarding implementation of a zonal fare system.

Table 3-1 provides current patronage estimates for the proposed stations within the Metro Red Line Mid-City Segment. Table 3-2 displays the year 2020 daily patronage estimates in graph form.

3.2 Bus Access/Parking

Bus access for the Olympic/Crenshaw Station would be provided via the existing on-street designated bus stops at the intersection. No additional parking would be provided for the Olympic/Crenshaw Station.

Currently, at the Olympic/Arlington intersection there are four bus stops; buses traveling westbound on Olympic Boulevard stop at the northwest corner and buses traveling eastbound on Olympic Boulevard stop at the southeast corner; buses traveling southbound on Wilton/Arlington stop at the northwest corner of Olympic/Wilton, and buses traveling northbound stop on the southeast corner of Olympic/Arlington. If a station were to be constructed at Olympic/Arlington the existing eastbound bus stop would be relocated from the southeast corner to the southwest corner of the intersection, and the southbound bus stop would be relocated from the northwest corner to the southwest corner of Olympic/Arlington (see Figure 2-2). The southwest corner of Olympic/Arlington would house the entrance to the subway and it would be designed to allow buses traveling eastbound and southbound to stop near the entrance. The existing bus stops on the northwest corner for buses traveling westbound and on the southeast corner for buses traveling northbound would be maintained. Kiss-and-ride zones would be provided on Olympic Boulevard and Arlington Avenue abutting the station entrance. No parking would be provided at the Olympic/Arlington Station.

Table 3-1
Red Line Mid-City Segment Patronage Estimates For The Year 2020

Mode of Access	Alternative A						Alternative B						Alternative C					
	Olympic/Arlington Station			Pico/San Vicente Station			Olympic/Arlington Station			Venice/San Vicente Station			Olympic/Crenshaw Station			Pico/San Vicente Station		
	Daily	AM Peak Hour		Daily	AM Peak Hour		Daily	AM Peak Hour		Daily	AM Peak Hour		Daily	AM Peak Hour		Daily	AM Peak Hour	
		A	D		A	D		A	D		A	D		A	D		A	D
Park-and-Ride	0	0	0	1,394	267	0	0	0	0	1,394	267	0	0	0	0	1,325	253	0
Kiss-and-Ride	175	33	0	751	144	0	175	33	0	751	144	0	333	61	0	713	137	0
Bus	2,061	336	240	8,553	1,254	1,152	2,061	336	240	8,553	1,254	1,152	1,679	255	161	8,572	1,274	1,127
Walk	639	68	52	648	72	65	639	68	52	648	72	65	1,614	218	191	658	75	79
Total	**2,875**	**437**	**292**	**11,346**	**1,737**	**1,217**	**2,875**	**437**	**292**	**11,346**	**1,737**	**1,217**	**3,626**	**534**	**352**	**11,268**	**1,739**	**1,206**

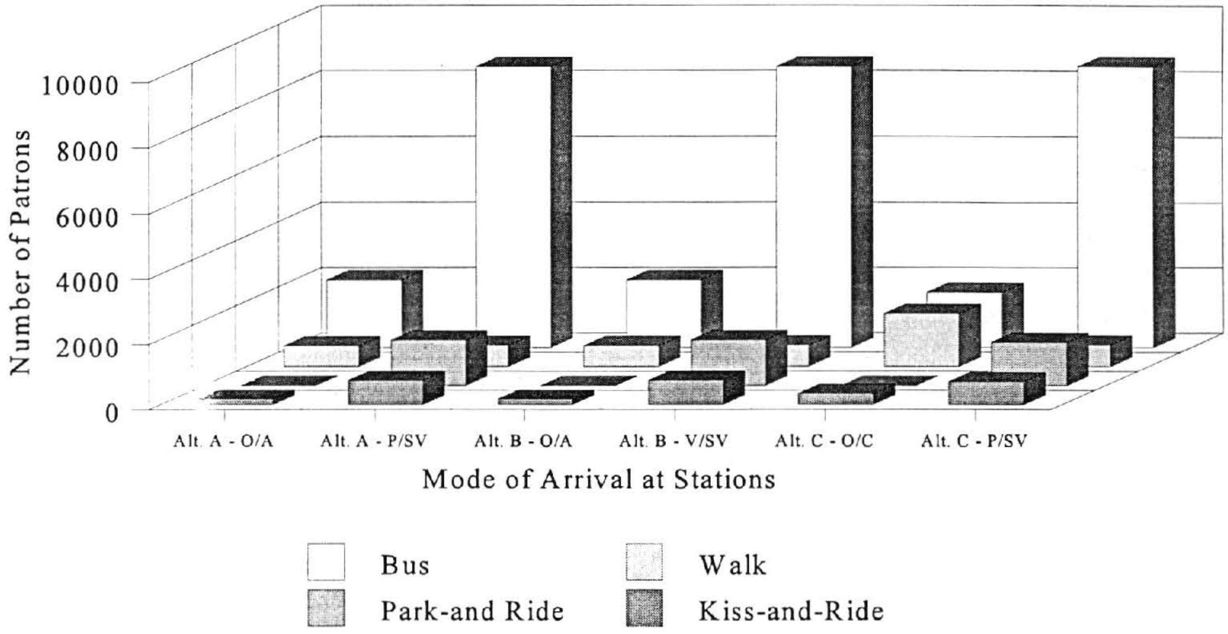
A = Arrival at the station to board the train, D = Departure from the station after getting off the train.

Source: MTA Long Range Plan Patronage Projections, 1995.

NOTE: Table 3-2 shows the daily patronage information in this table in graphic form.

Table 3-2

Year 2020 Daily Patronage Estimates Graph



O/A - Olympic/Arlington Station   P/SV - Pico/San Vicente Station
O/C - Olympic/Crenshaw Station   V/SV - Venice/San Vicente Station

At the proposed Mid-City terminus station (either Pico/San Vicente Station or Venice/San Vicente Station), the existing Rimpau Bus Terminal, which serves MTA and Santa Monica Municipal Bus Lines (SMMBL), would be relocated on-site and expanded to provide 9 off-street bus bays for passenger loadings and 12 bays for bus layovers. In addition, up to 1,000 park-and-ride spaces would be constructed to accommodate parking needs at this station, with initial construction of 250 parking spaces (see Figures 2-3 and 2-5).

The MTA would not provide any parking lots for the Olympic/Arlington Station (Alternatives A and B) or the Olympic/Crenshaw Station (Alternative C). This does not preclude the private sector from either opening parking lots in the vicinity of the station or from making available existing parking spaces that might not be utilized at this time. For example, the Buddhist Temple (on Wilton Place just north of Olympic Boulevard), whose parking lot is not extensively used during the week, could lease parking spaces on a daily basis to patrons of the Red Line.

3.3 Service Frequency

During peak periods, four-car trains would arrive at the Metro Red Line Mid-City Segment stations approximately every 5 minutes. During off-peak periods, four-car trains would arrive approximately every 10 minutes.

3.4 Train Type and Size

The passenger vehicle used for the Metro Red Line is a heavy rail vehicle. Each train used on the Mid-City Segment would typically consist of at least four electrically powered cars. Each car is approximately 75 feet long and cars must be operated in pairs to make up trains of two, four, or six cars. Based on current ridership projections, four-car trains will be used for operating the train service for revenue operation data (ROD) and up to the design year of 2015. Planned scheduled capacity will be able to meet or exceed ridership demands. Each train car has a peak load capacity of 169 passengers. Trains would be operated using an Automatic Train Control (ATC) System that regulates train speeds and controls entry and stopping of trains at stations. All non-automatic functions would be controlled by the operator in the train's lead car. These functions include operation of passenger vehicle doors, train dwell times in stations, train departures, and communications.

Station platforms associated with this project would be 450 feet long. Each station would be able to accommodate up to six heavy rail cars.

3.5 Train Maintenance

~~The Metro Red Line Mid-City Segment may require the addition of two four-car trains to the MTA fleet. These~~ Trains would be maintained at the existing Metro Rail central maintenance facility, located between First and Fourth streets on the east side of Santa Fe Avenue, east of downtown Los Angeles. This would not require expansion of, or substantial changes to, the activities at the yard.

4.0 CONSTRUCTION METHODS[1]

This section describes the methods that would likely be used for constructing any of the three alternatives. This project requires the construction of tunnels and stations. The construction methods for each is provided below:

4.1 Tunnels

4.1.1 Overall Approach and Schedule

The Pico/Venice/San Vicente site would be the main construction staging area for the project. After the pre-construction and utility relocation activities have been completed, the physical construction of this project would begin with the clearing, razing of buildings, grading, and otherwise preparing of the Pico/Venice/San Vicente site. Next, the tunneling process would begin with the cut-and-cover portions of the project within either Pico Boulevard (Alternatives A and C) or Venice Boulevard (Alternative B). Cut-and cover construction methods would be used between the Pico/Venice/San Vicente site and Victoria Avenue in either Pico or Venice Boulevards. For Alternatives A and B, commencing from Victoria Avenue twin-tunnels would be bored along the alignment until they reach the existing station at Wilshire/Western. Once the tunnels have been bored past the location of the intermediate station at Olympic/Arlington construction could begin on this station, although initial station construction could begin before or after the bored tunnels reach this area. ~~Excavation for the station must not break into the tunnel area until after the tunnel liner is complete.~~ For Alternative C, commencing from Victoria Avenue twin-tunnels would be bored along the alignment until they reach Crenshaw Boulevard at a point approximately 1,100 feet south of Country Club Drive. Construction within Crenshaw Boulevard would be cut-and-cover from this point to a point just north of 8th Street. From this point, twin-tunnels would be bored along the alignment until they reach the existing station at Wilshire/Western. The intermediate station at Olympic/Crenshaw would be constructed within the cut-and-cover portion of the alignment.

Construction efforts, including utility relocations, would occur over an estimated 6½-year period. However, depending on the level of funding received from the U.S. Congress for the project, construction efforts could take ~~up to 9½ years~~ longer.

Although a preliminary approach for construction of the build alternatives has been identified, the final construction plan would be further developed during subsequent engineering stages, and it would be partially designed/modified by the selected contractors. Following is a likely construction scenario that was developed for each project alternative in order to allow for a reasonable assessment of environmental impacts during the construction period.

Table 4-1 provides the estimated construction schedule for each alternative.

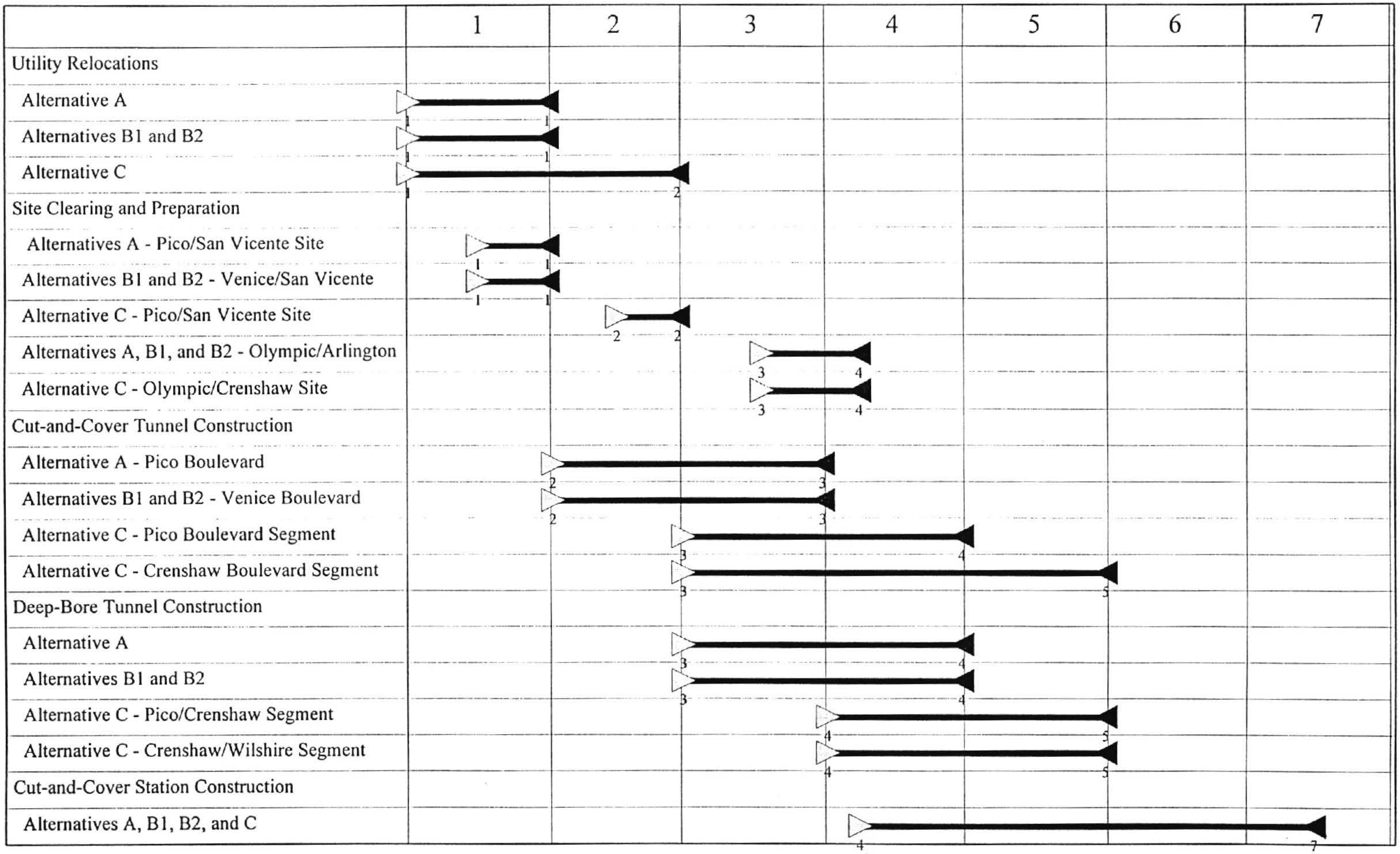
4.1.2 Pre-Construction Activities

Pre-Construction Building Survey

A pre-construction structural survey would be conducted along the LPA to determine and document the existing condition/appearance ~~integrity~~ of existing buildings. Excavation for underground stations and tunnels requires

[1] Construction impacts are not described in this section. Construction impacts are fully described in Section 7.0 (Environmental Impact Analysis) under their appropriate heading.

Table 4-1
Estimated Construction Schedule (In Years)



consideration of the condition of adjacent buildings to determine the appropriate excavation support system. This provides the ability to quickly evaluate if any impacts could be related to the rail construction activities.

Pre-Construction Business Survey

MTA public affairs staff would contact and interview individual businesses along the LPA to obtain 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 is used in developing worksite traffic control plans, identifying alternative access routes, and making efforts during construction to maintain critical business activities.

4.1.3 Utility Relocation[2]

The proposed project would require the relocation of exiting utilities within the project area. In the course of developing the proposed alignment alternatives, various constraining factors were analyzed, among which was the presence of major utilities underlying parallel and crossing streets in the proposed Metro Red Line Mid-City Segment area. Conflicts to the alignments presented by major storm drains and sanitary sewers were investigated, and the engineering solutions to avoid extensive relocation of major storm drains and sewers were evaluated. Utility relocations would occur mainly in areas where cut-and-cover construction methods would be used; where deep bore tunneling is used, utilities typically do not need to be relocated.

To relocate a sanitary sewer, which is smaller in diameter than a storm drain, a trench is dug, the new sewer line is placed in the trench, the trench is backfilled, and the street/ground surface is restored. Sewer relocation typically involves double lane closures within the affected streets. To minimize traffic disturbances, these trenches may be covered with steel plates when construction activity is not occurring.

The relocation of larger storm drain structures, if necessary, would involve cut-and-cover construction similar to that described below for the proposed subway tunnels. Streets would be closed while initial support, excavation, and decking activities occur. Once street decking is in place, construction of the utility lines would occur below ground and street disturbances would be minimized. All proposed improvements to storm drains and sewers require the approval of the City of Los Angeles, Department of Public Works, Bureau of Engineering, and the County of Los Angeles, Department of Public Works, Hydrologic and Water Conservation Division.

Other utilities that would need to be accommodated during construction include telephone lines, cable lines, water mains, and gas lines which are generally found within several feet of the street surface. These utilities would be temporarily removed from the cut-and-cover area and replaced in essentially their original locations during final backfilling above the tunnels or stations. In some cases existing utility lines may be supported in place during cut and cover operations. The extent to which this would occur is determined during final engineering design.

Typical rapid transit excavation and construction methods are included below to provide a clear understanding of the feasible options for maintaining utility service and protecting the utilities during the construction period.

The majority of the utility impacts produced by the Metro Rail project would occur in the vicinity of the cut-and-cover station sites. The following sequence is typical for cut-and-cover transit construction in areas where the site boundaries are constrained (i.e., in City streets):

[2/] Specific impacts to utilities are described in Section 7.13 (Utilities) of this document.

1. Existing utility facilities are located and marked and, at certain critical locations, may be exposed and rearranged.

2. The excavation support system is installed. Simultaneously, some utilities may be rearranged or supported in place to accommodate transit construction.

3. Street pavement is removed and the utilities are exposed. The deck beams are placed and utility support structures are attached to them.

4. Temporary decking is installed and the street reopened for use.

5. The site is excavated and the reinforced concrete shell of the station is constructed.

6. Backfill is placed over the station up to the utility zone.

7. Utility supports are removed and the utilities are reinstalled/reburied in the ground.

8. The deck structure is removed and final adjustments are made to utilities and service connections.

9. The pavement is restored and the street reopened to public use.

10. Transit construction continues to completion in off-street areas.

A critical part of the project design is to ensure that the utilities in the transit corridor are properly protected or replaced during construction, that the essential service provided by the utilities is maintained and that utility relocation or reconfiguration does not delay the project. The design of the proposed alignments and stations for the Mid-City Segment would include a comprehensive program that identifies all utilities in a construction area and defines a plan of action for accommodating each of them. Consequently, when the transit contractor begins his work, some utilities may be abandoned (if no service capability is lost) ~~taken from service~~ or rerouted clear of the site. It is anticipated that a large number of utilities would remain in place, and would ~~these, therefore, must~~ be considered an integral part of project construction.

4.1.4 Property Acquisition/Preparation of Contractor Staging Areas

Implementation of Alternatives A (Wilton/Arlington/Pico), B1 (Wilton/Arlington/Venice - Lower Elevation), and B2 (Wilton/Arlington/Venice - Higher Elevation) would require two construction staging areas for tunneling and cut-and-cover operations: a) one on the southwest corner of Olympic/Arlington, and b) one at the Pico/ or Venice/San Vicente Station site. Alternative C would require three construction staging areas: a) one on the west side of Crenshaw Boulevard between Wilshire Boulevard and 8th Street, b) one on the southwest corner of Olympic and Crenshaw Boulevards, and c) one at the Pico/San Vicente Station site. The main construction staging area for all ~~four~~ "build" alternatives would be at the Pico/ or Venice/San Vicente Station ~~or Pico/San Vicente Station~~ site. Each of the intermediate station locations (Olympic/Arlington or ~~and~~ Olympic/Crenshaw) would have a smaller construction staging area limited to the needs for constructing the station. Since Alternative C has two separate tunnel segments (southern and northern), ~~would also require~~ a construction staging area would also be required for installing the TBM at 8th/Crenshaw.

Construction staging areas would be used for construction personnel facilities and offices, equipment laydown, ~~daytime~~ stockpiling of excavated soil, employee parking, materials delivery, water treatment, and slurry treatment. Temporary water treatment facilities would be constructed at each construction area. Each facility would be enclosed within a structure covering about 40 by 100 feet and reaching a maximum height of 40 feet. Street closures would not be required during this stage of construction.

Table 4-2 identifies the number and types of equipment that would typically be used during site clearing. Site clearing activities would occur during daytime shifts only.

The following paragraphs discuss the location of contractor staging areas for each of the proposed alternatives. Table 4-3 describes existing buildings on each of these sites that would be acquired and demolished during the site clearing stage. Each of the sites would be cleared at the outset of the construction period. Prior to site clearing, asbestos abatement would occur where necessary.

Private property would be acquired for all construction staging areas. For specific information on property acquisition requirements for each alternative, please refer to section 7.6 (Property Acquisition and Displacement).

4.1.5 Tunnel Boring Machinery/Techniques

Tunnel Boring Machine

~~The tunnel boring machine (TBM) to be employed by~~ All tunnel excavation prior to the ~~beginning of tunnel excavation for the~~ "Eastside Extension of the Red Line," MTA contractors utilized ~~is~~ an open ~~closed~~ face tunnel shield type of tunnel boring machine (TBM) on previous and current tunnel construction. This type of TBM ~~It~~ is composed of a cutter head and shield that is the same diameter as the tunnel, and a long "train" of support and installation equipment (the trailing gear). Behind the tunnel shield itself is the motor that turns the cutter head against the tunnel face and equipment to remove the excavated material (muck) from the face and out from the tunnel. This removal equipment is typically comprised of a screw conveyor that ~~which then~~ deposits the muck into muck cars. Muck cars are operated similar to trains; they are coupled together and pulled by an electric engine car on rails constructed within the tunnels. These muck cars ~~are formed into a train to~~ remove the muck from the tunnels ~~shaft site~~ to the construction staging area where it is loaded onto trucks and removed from the site. Belt conveyor systems may also be ~~were~~ used as an alternative to the muck cars. Behind the TBM cutter head and motor assembly is the equipment to lift, place, and secure the tunnel liner rings into the newly excavated tunnel. These liner rings are delivered from the construction staging area as the machine advances. The entire TBM, from cutter head to the end of the trailing gear, is approximately 300 feet long. Recent MTA construction experience with open ~~closed~~ face TBMs has resulted in typical surface settlements between ½ and ¾ inches along public rights-of-way, with occasional settlements higher, up to 10 inches in one instance.

To reduce the potential for settlement, the MTA has recently specified that their contractors utilize an alternative type of tunneling technology that minimizes ground settlement. This alternative type of tunneling technology ~~An Earth Pressure Balance Shield Tunnel Boring Machine is shown in Figure 4-1. Recent MTA construction experience with open face methods has resulted in typical surface settlements between ½ and ¾ inches along public rights-of-way, with occasional settlements higher, up to 10 9 inches in one instance. Due to the large number of private structures along the alignments associated with this project, a decision to~~ employs a TBM with positive face control technology, known as "Earth Pressure Balance" (EPB) or "slurry shield." This is a proven technology used on European subways and other tunnel applications worldwide. ~~that minimizes ground settlement was pursued.~~ Although this technology is more expensive, the EPB (or slurry - as explained below) type of TBM also controls ~~machine was pursued for the Mid-City Segment project for~~ subsurface gas ~~control~~, ~~for reducing potential settlement effects,~~ and reduces dewatering requirements. An Earth Pressure Balance Shield Tunnel Boring Machine is shown in Figure 4-1. Use of positive face control has the benefit of improving control of the ground being tunneled through, resulting in less surface settlement than occurs with open face

Table 4-2
Equipment Used During Site Clearing at Each Contractor Staging Area

Type of Equipment	Used During Daytime (7 AM - 8 PM)	
	Number	Number of hours used
Crawler dozer/loader	4	13
Pavement breaker	2	13
Rubber-tire loader/bobcat	3-4	13
Excavator/backhoe	4	13
Generator/compressor	4	13

Table 4-3
Existing Structures at Contractor Staging Areas to be Demolished

Alternative	Site	Description of Structures
Alternative A	Olympic/Arlington Station	1 Single-Family Residence, 2 Single-Family Residences acquired but not demolished, and 3 Commercial Buildings
	Pico/San Vicente Station site and southeast corner of Pico and West Boulevards	8 Commercial Buildings, 1 Commercial/Multi-Family Building, 3 Multi-Family Buildings, and 2 Public Buildings
Alternatives B1, B2	Olympic/Arlington Station	1 Single-Family Residence, 2 Single-Family Residences acquired but not demolished, and 3 Commercial Buildings
	Venice/San Vicente Station site	7 Commercial Buildings, 1 Commercial/Multi-Family Building, and 3 Multi-Family Buildings
Alternative C	Contractor work area on the west side of Crenshaw Boulevard between Wilshire Boulevard and 8th Street	9 Single-Family Residences, 8 Multi-Family Buildings, 1 Commercial Building, and 1 ~~Church~~ Building Used as a Church.
	Olympic/Crenshaw Station	1 Service/Gas Station, and 4 Commercial Buildings
	Pico/San Vicente Station site	8 Commercial Buildings, 1 Commercial/Multi-Family Building; 3 Multi-Family Buildings, and 2 Public Buildings

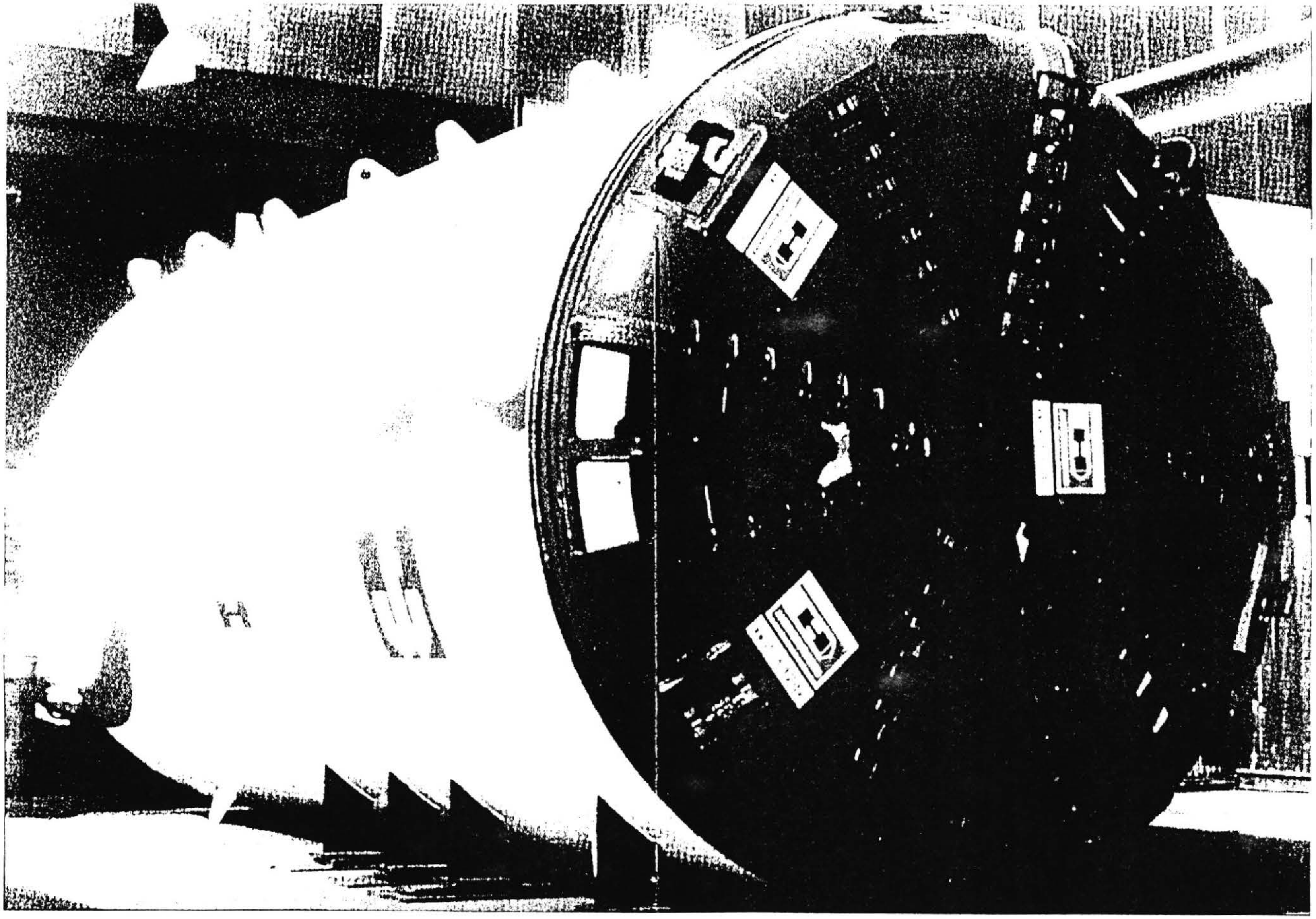


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FIGURE 4-1
EARTH PRESSURE BALANCE SHIELD TUNNEL BORING MACHINE

shield machines. In addition, it is not generally necessary to dewater the ground except in areas where cut-and-cover construction methods are used thereby eliminating most of the problems associated with treatment and disposal of groundwater. An EPB TBM also exerts an outward pressure that essentially eliminates the potential for subsurface gases to enter the active tunneling area thereby eliminating the danger to workers from exposure to subsurface gases.

Positive Face Technology

Excavating tunnels through soil is referred to as soft ground tunneling. The behavior of the ground, particularly the stability of the excavated surface (face), governs the method of excavation. If the face becomes unstable during excavation, ground losses occur which could translate to surface settlements. A positive face control TBM supports the face by maintaining pressure on the excavated surface during excavation, thereby maintaining its stability and reducing settlement.

The outer precast concrete tunnel liner is assembled within the shield. As these outer concrete liner segments emerge from the machine, grout is pumped between the segments and excavated ground. This provides more immediate ground support in the area being tunneled through than the open face shield machines, and further reduces the potential for ground losses and associated settlements.

In addition to the use of the EPB tunnel boring machine, other special precautions would be taken to prevent damage to structures near the tunnel alignments due to differential settlement. These precautions could range from compaction grouting, discussed later ~~earlier~~ in this chapter, (as illustrated in Figure 4-2) to underpinning of sensitive structures. Special attention would be paid to underpinning and protection of the foundations of the West Street Bridge at the San Vicente Station approach.

There are two types of positive face control machines: EPB machines and slurry machines. The means used to maintain the positive face pressure is the principal difference between the two types of TBMs. Each type has advantages and disadvantages relative to the geology encountered, presence of hazardous materials, surface support requirements, and other factors. Each technology is described briefly below. The choice of positive face control technology and machine would likely be left to the selected construction contractor but, for purposes of this document, a worst case condition will be assumed for each environmental topic.

Earth Pressure Balance TBM

EPB machines maintain tunnel face stability with a zone of "plastic" soil at the cutter head and in the muck chamber behind the cutter head. Pressure on the face is controlled by thrust on the cutter and controlled removal of muck through a screw conveyor behind the muck chamber. EPB machines operate most effectively in soils having a high percentage of fine-grained particles (silt and clay). The EPB cutter head, when moving against these soils, causes the excavated soil and water to develop a plastic consistency. However, successful operation through soils with a lower percentage of fine grained particles (sands) often can be achieved through the addition of bentonite or foams to create a plastic consistency within the muck chamber.

EPB machines can handle cobbles and boulders (up to about 18 inches) through the cutter head and screw conveyor (for a typical 24 inch solid-stem screw). Larger stones can sometimes be broken by the cutter head or worked to the side of the tunnel but their removal may require that the machine be stopped, which delays the tunneling.

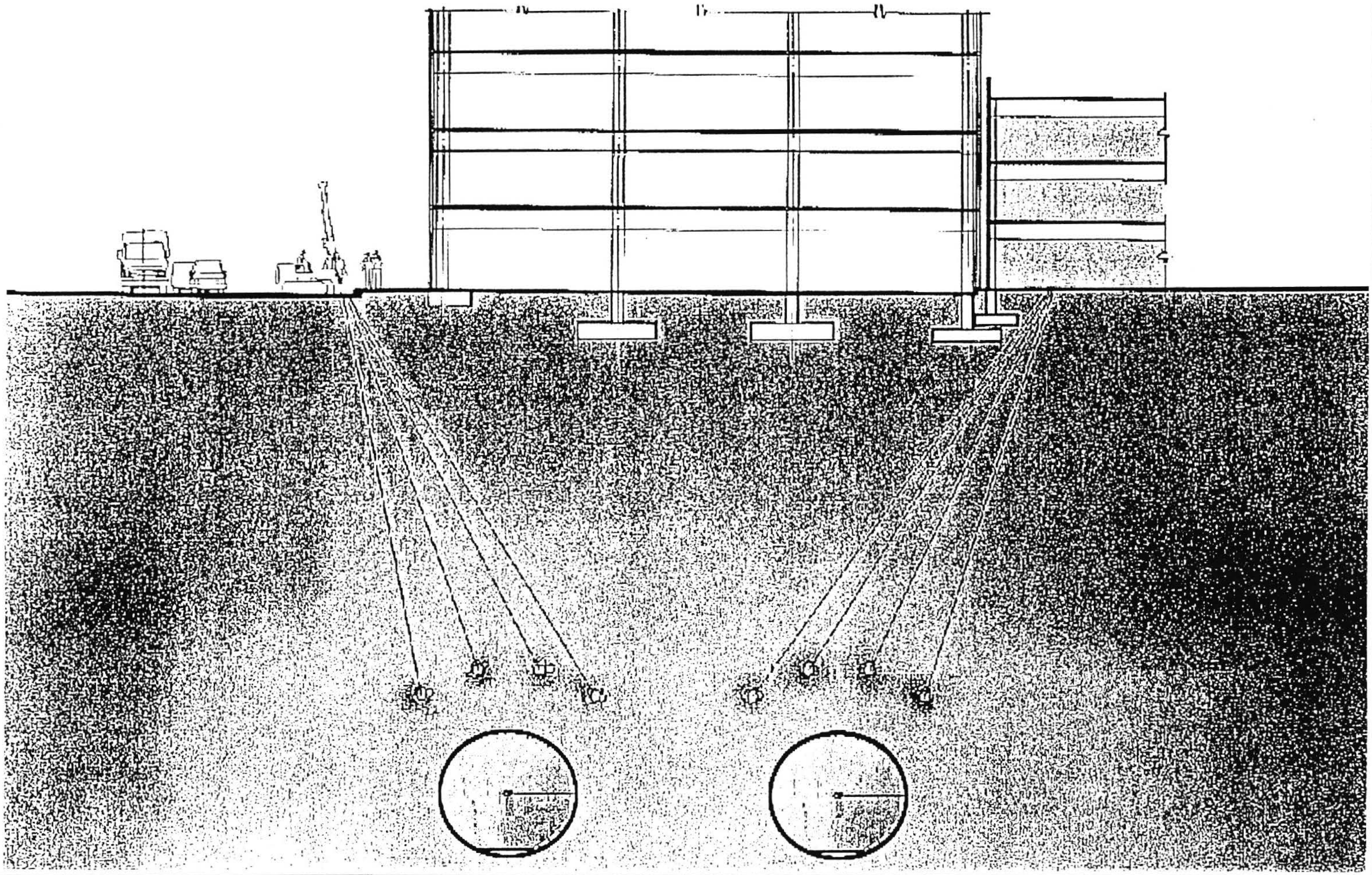

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FIGURE 4-2
COMPACTION GROUTING FROM SURFACE

Surface support facilities are similar to those required for open face tunneling machines, i.e., area for a shaft/portal site, facilities to remove muck from the shaft, storage areas for liner materials, excavated muck, contractor offices, maintenance shops, and power facilities.

Forward progress (or an advance rate) of 30 to 40 feet per day is usually assumed for an EPB machine.

Slurry TBM

Slurry machines maintain tunnel face stability with a zone of pressurized bentonite slurry at the cutter head. The slurry forms a thin, low-permeability cake on the ground immediately after exposure, resulting in a membrane between the slurry and the soil. The slurry is pressurized with compressed air from a reservoir behind the cutter head. Pressure on the face is controlled by controlling the pressure in the air chamber, using the slurry as a transfer fluid. The slurry also carries the excavated material away from the cutter head and is pumped directly to the construction staging area, eliminating the need for muck cars. Slurry machines perform best in coarser-grained cohesionless soils and may be advantageous in mining through gassy or contaminated ground conditions because the tunnel working environment can be better isolated from these hazards with a closed loop slurry delivery and removal system which is illustrated in Figure 4-3. However, if contaminated soil conditions are encountered, the muck and slurry would typically become, and remain, contaminated.

Slurry machines can pass soil and rocks up to about 60 percent of the diameter of the slurry pipe diameter (the pipe is typically 6 to 8 inches diameter). A stone crusher at the bottom of the slurry chamber can break down larger rocks for passage through the slurry system. Depending on the design specifics, rocks as large as 1 to 3 feet can be broken down by the stone crusher. As with the EPB machine, larger rocks may also be broken down by cutting tools or the cutterhead. In some cases manual removal, involving stopping the machine, may be required. A slurry shield and stone crusher are shown in Figure 4-4.

A slurry plant is necessary to mix and supply slurry to the TBM and to separate the soil particles and rock fragments from the return line. The separation plant (schematically illustrated in Figure 4-3) is usually located at the construction staging area. Surface facilities could require 10,000 to 40,000 square feet of surface area. The larger area can also be reduced by stacking the components into a high profile structure. Other surface support facilities would be the same as for an EPB or other tunneling machine, including an area for a shaft/portal site, facilities to remove muck from the shaft, storage areas for liner materials, excavated muck, contractor offices, maintenance shops, and power facilities.

An advance rate of 30 to 40 feet per day can be assumed for a slurry machine.

Excavate Access Ramp, Place Tunneling Machine, Deck Over Shaft Site

The critical activity in the construction of the alternative alignments from a schedule point of view would be the construction of the tunnels themselves. The construction of the tunnels would therefore be the first order of work.

Once the contractor work areas are prepared, facilities for tunneling activities would be set up. For all of the Alternatives ~~A, B, and C~~, an access ramp would be excavated for the TBMs at the Pico/ or Venice/San Vicente site ~~within which the tunneling machine can be placed would be excavated~~. The TBMs would be transported though the cut-and-cover area within Pico Boulevard (Alternatives A and C) or Venice Boulevard (Alternative B) to a point near Victoria Avenue where tunneling activities would commence. For Alternative A, the twin-bore tunnels would proceed in an easterly direction under Pico Boulevard and would follow the alignment (shown in Figure 2-1) to its connection point with the existing Red Line tunnels under Wilshire Boulevard just west of

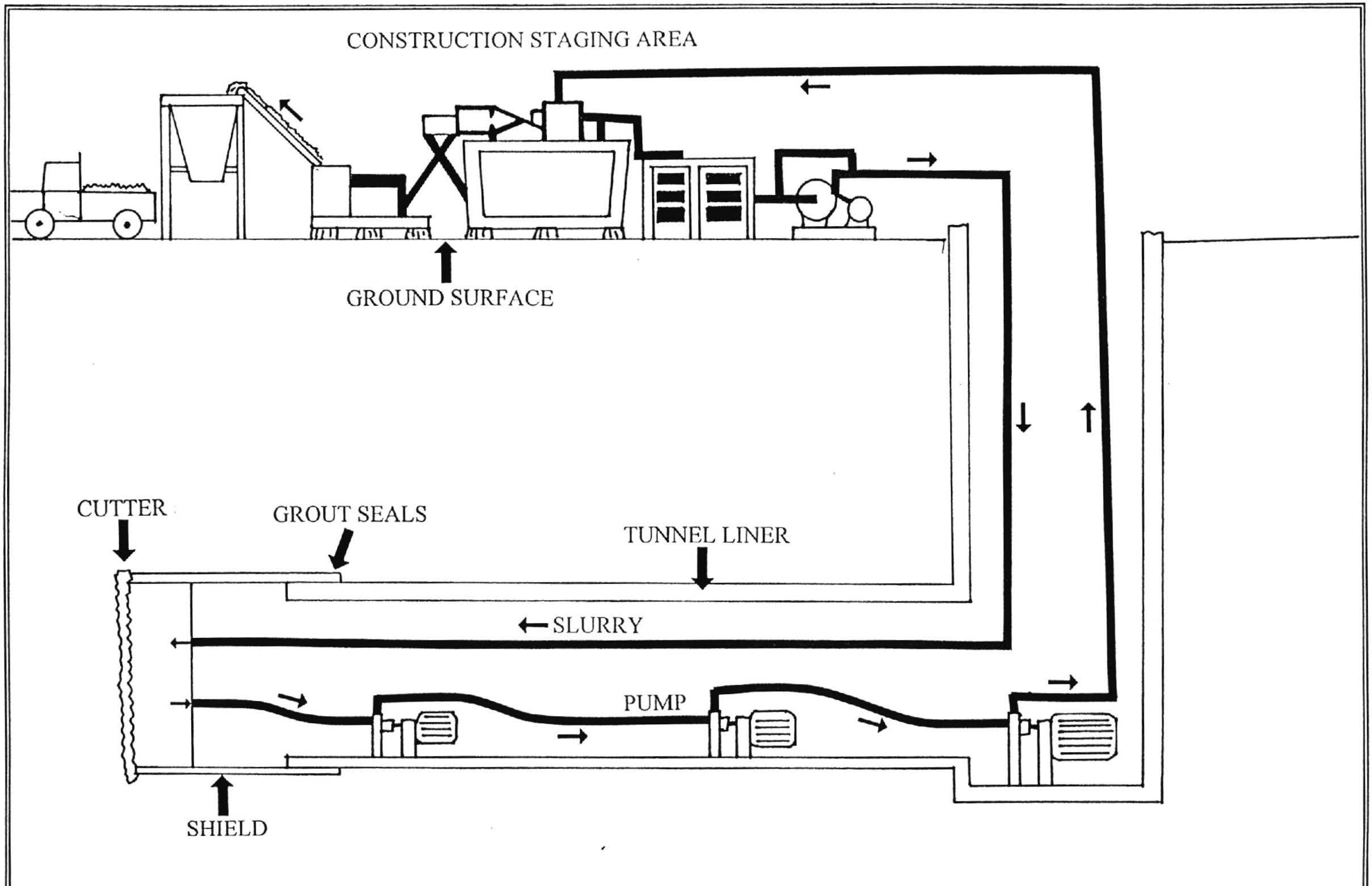

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FIGURE 4-3
CLOSED LOOP SLURRY DELIVERY, REMOVAL AND SEPARATION SYSTEM

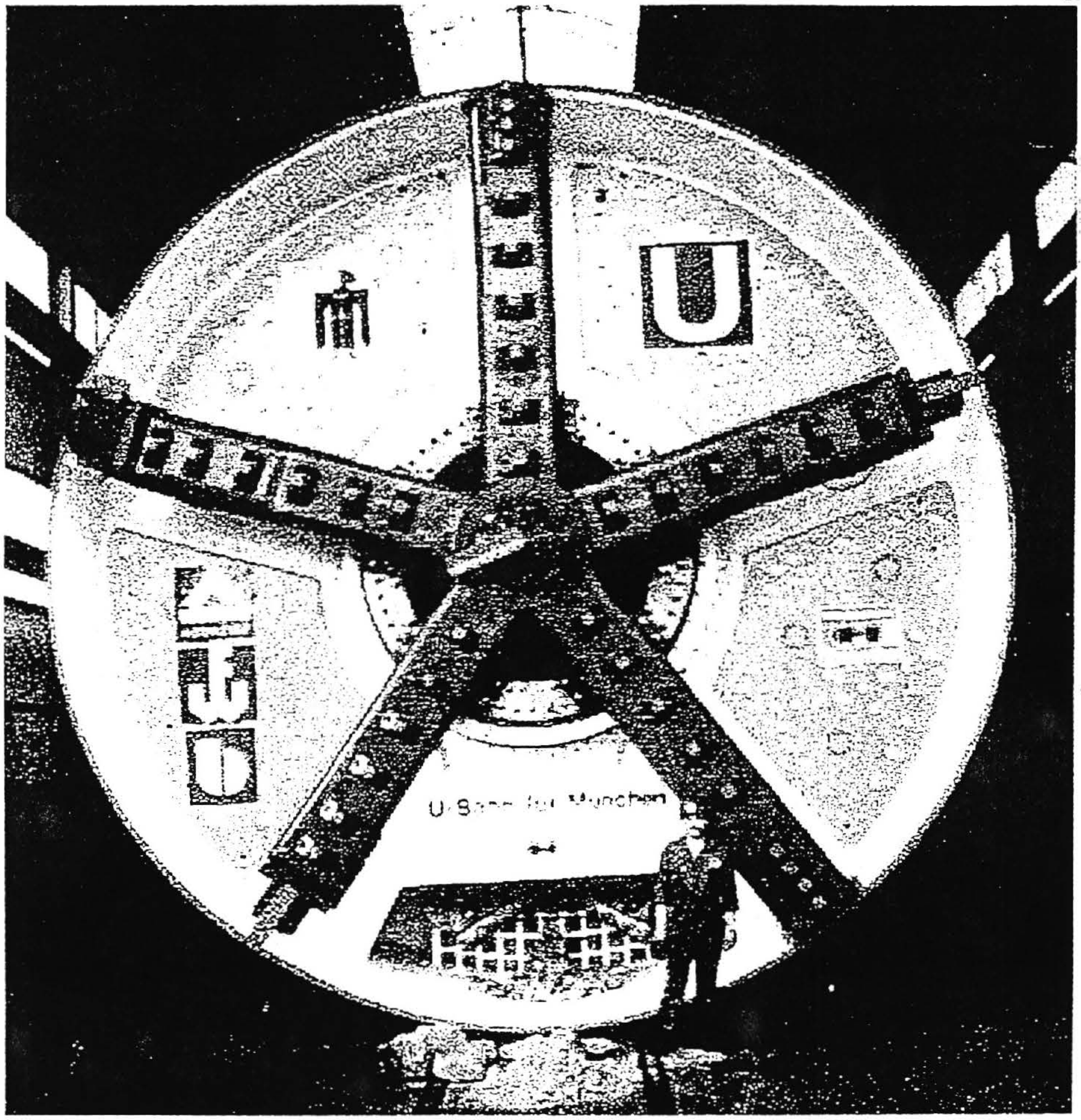

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FIGURE 4-4
SLURRY SHEILD AND STONE CRUSHER

Western Avenue. For Alternative B, the twin-bore tunnels would proceed in an easterly direction under Venice Boulevard following the alignment shown in Figure 2-4 until it connects to the existing Red Line tunnels under Wilshire Boulevard just west of Western Avenue. For both Alternatives A and B, excavated material from the tunnel would be transported through the cut-and-cover segment and removed at the Pico/ or Venice/San Vicente site.

Alternative C would have two tunnel segments (southern and northern). Within the right-of-way of Crenshaw Boulevard the tunnel would be constructed with a cut-and-cover method. The southern segment twin-bore tunnels would immediately begin to turn in a northerly direction from Pico Boulevard and proceed until they were completely under Crenshaw Boulevard at a point approximately 1,100 feet south of Country Club Drive (shown in Figure 2-7). At this location, the TBMs could either be transported through the cut-and-cover area within Crenshaw Boulevard or they could be disassembled and transported to the construction staging area on the west side of Crenshaw Boulevard between Wilshire Boulevard and 8th Street. At this location, a second access ramp ~~this shaft~~ could be excavated between ~~off-street within~~ the adjacent construction staging ~~work~~ area and the cut-and-cover area within Crenshaw Boulevard. The TBMs would be placed and reassembled within the cut-and-cover area in Crenshaw Boulevard and tunneling would commence from this point and continue in an easterly direction under Wilshire Boulevard following the alignment shown in Figure 2-7 until it connects to the existing Red Line tunnels under Wilshire Boulevard just west of Western Avenue. ~~Access to the access ramp would be provided via the adjacent work area.~~ Excavated material from the northern tunnels could be transported through the cut-and-cover segment and removed at the Pico/San Vicente site or it could be removed at the construction staging area on the west side of Crenshaw Boulevard between Wilshire Boulevard and 8th Street.

~~For Alternatives A and C, the tunnel segment begins within Pico Boulevard in the vicinity of Victoria Avenue. A cut-and-cover segment would be constructed between the Pico/San Vicente Station site and the tunnel segment. An access ramp would be excavated at the Pico/San Vicente site. The tunneling machine would be placed in the ground via this access ramp and transported through the cut-and-cover segment to the beginning of the tunnel segment. Excavated material from the tunnel would be transported through the cut-and-cover segment and removed at the Pico/San Vicente site.~~

~~For Alternative A, the twin-bore tunnels would proceed in an easterly direction under Pico Boulevard and would follow the alignment (shown in Figure 2-1) to its connection point with the existing Red Line tunnels under Wilshire Boulevard just west of Western Avenue. For Alternative C, the twin-bore tunnels would immediately begin to turn in a northerly direction and proceed until they were completely under Crenshaw Boulevard at a point approximately 1,100 feet south of Country Club Drive (shown in Figure 2-7). Here the TBMs would be removed from the ground via cut-and-cover within Crenshaw Boulevard, and transported to the construction staging area on the west side of Crenshaw Boulevard between Wilshire Boulevard and 8th Street. At this point, the TBMs would be reassembled and placed back in the cut-and-cover area within Crenshaw Boulevard. The TBMs would continue to tunnel from this point by turning in a easterly direction and proceed to its connection point with the existing Red Line tunnels under Wilshire Boulevard just west of Western Avenue. Excavated material from the tunnels would be transported through the cut-and-cover segments and removed at the Pico/San Vicente site for both Alternatives A and C.~~

~~For Alternative B, the tunnel begins within Venice Boulevard in the vicinity of Victoria Avenue. A cut-and-cover segment would be constructed between the Venice/San Vicente Station site and the tunnel segment. An access ramp would be excavated at the Venice/San Vicente site. The tunneling machine would be placed in the ground via this access ramp and transported through the cut-and-cover segment to the beginning of the tunnel segment. The twin-bore tunnels would proceed in an easterly direction under Venice Boulevard following the alignment shown in Figure 2-4 until it connects to the existing Red Line tunnels under Wilshire Boulevard just~~

~~west of Western Avenue. Excavated material from the tunnel would be transported through the cut-and-cover segment and removed at the Venice/San Vicente site.~~

~~For Alternatives A and B, twin-bored tunnel construction would continue uninterrupted until it connects to the existing tunnel under Wilshire Boulevard approximately ½-block west of Western Avenue. For Alternative C, tunnel construction would occur in the curves between Pico Boulevard and Crenshaw Boulevard, and Crenshaw Boulevard and Wilshire Boulevard; tunnel construction would occur within Wilshire Boulevard to the existing tunnel under Wilshire Boulevard approximately ½-block west of Western Avenue.~~

For all alternatives, the TBMs would most likely be removed by excavating a shaft in ~~down through~~ Wilshire Boulevard, however, the contractor could leave the shield "skin" in place and remove the TBMs' mechanical equipment through the tunnel. ~~Within the right-of-way of Crenshaw Boulevard the tunnel would be constructed with a cut-and-cover method.~~

As part of its pre-construction survey, the MTA would conduct site specific analyses to identify structures that would require special construction stabilization. These studies would address all residential and commercial buildings along the alignment within 100 feet of the centerline of each ~~the~~ tunnel. Each structure would be evaluated based on its type of construction, age, and the depth of tunnel under the structure; and recommendations would be made ~~for building protection~~ to mitigate potential settlement should it be ~~determined that such protections are~~ warranted. These findings would be combined with studies of existing soils and actual performance of the TBM to determine whether grouting, underpinning, or other measures would be needed. ~~is indicated at specific locations or whether underpinning or other measures could may be recommended.~~ Protection would be specific to the needs of each structure, but could include: a) monitoring ground settlement, b) compaction grouting within the ground above the tunnel crown during tunneling, c) ground treatment (pre-treating the ground to improve the properties of the soil), d) monitoring buildings for damage, and e) implementing a quick response plan should settlement occur.

At the rear of the tunneling machines are tunnel liner construction mechanisms ~~erection devices~~ that raise precast concrete segments into place against the excavation. These segments constitute the outer lining of the tunnels in the form of rings of precast concrete. Two precast and bolted outer tunnel liners are illustrated in Figure 4-5. Each tunnel liner segment is between 4 and 5 feet long ~~wide~~ and has an external ~~internal~~ diameter of approximately 20 feet. Various components of the tunnel liner are identified in Figure 4-5. The "key" segment of the tunnel liner is the last piece placed in the crown (top) of the tunnel. The individual segments are bolted together within precast pockets with circumferential lock-up bolts. The joints between the segments are further tightened by the compression joint packer. A gasket waterseal is placed between the segments to prevent ground water from seeping into the tunnel. In addition, there is a plastic grout threaded lifting socket with a non-return (one-way) valve that allows grout to be injected from inside the tunnel to fill in the voids between the tunnel liner and the dirt.

The tunnel would be excavated at a diameter that would allow for a second inner lining consisting of HDPE (high-density polyethylene) and poured-in-place concrete. This is illustrated in Figure 4-6. A similar system is currently under design for the Metro Red Line East Side Extension. After the tunnel liners are in place, concrete for an emergency evacuation walkway would be ~~poured~~ placed along the sides of each tunnel to provide a safe evacuation route for passengers clear of the trainways. Borings referred to as "drop holes" may be made from the ground surface down to the tunnel lining to facilitate the concreting of the tunnel walkways and inverts[3]

[3/] An invert is the concrete floor of the tunnel to which the tracks are attached.

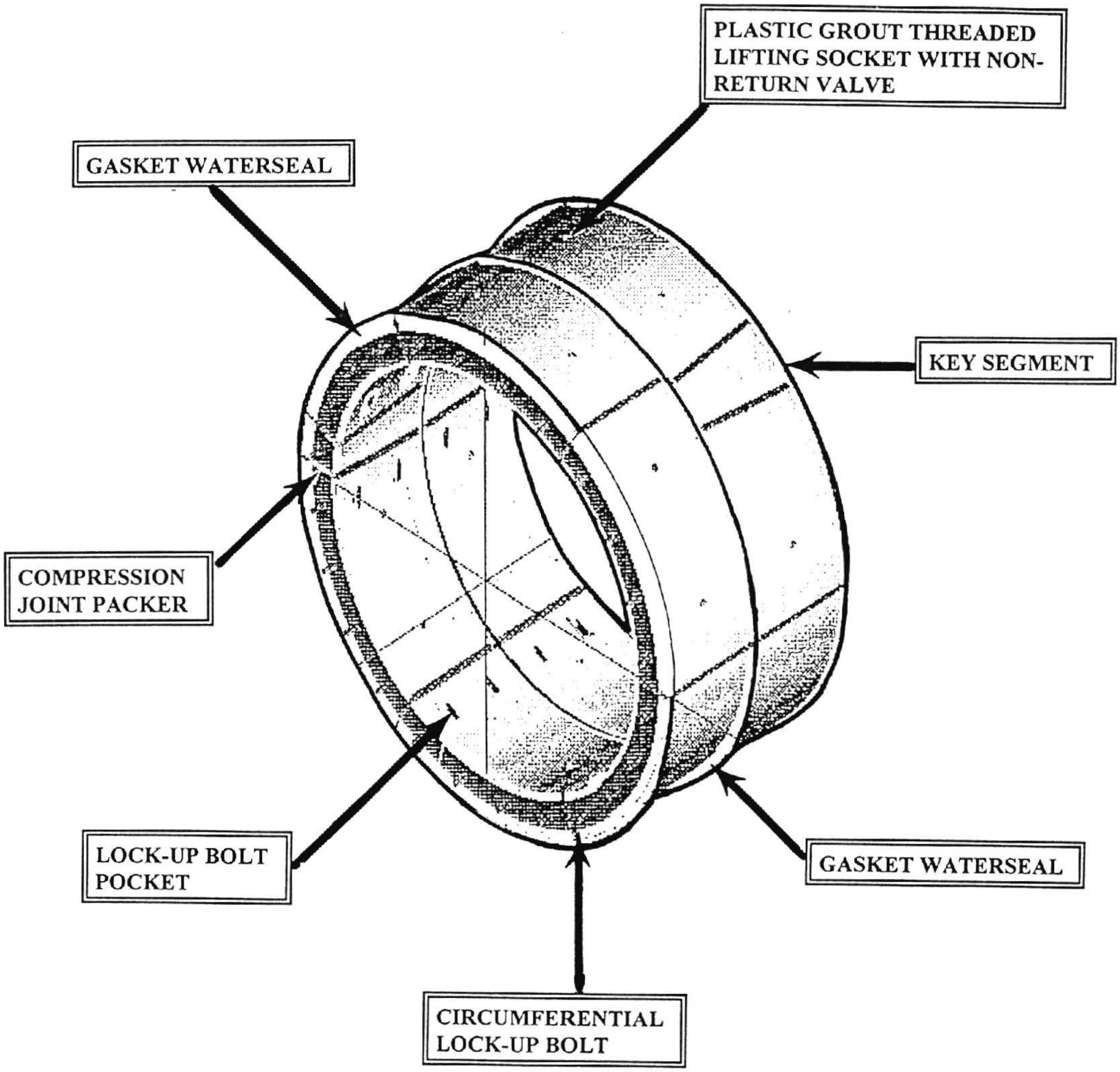

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FIGURE 4-5
PRECAST AND BOLTED OUTER TUNNEL LINER

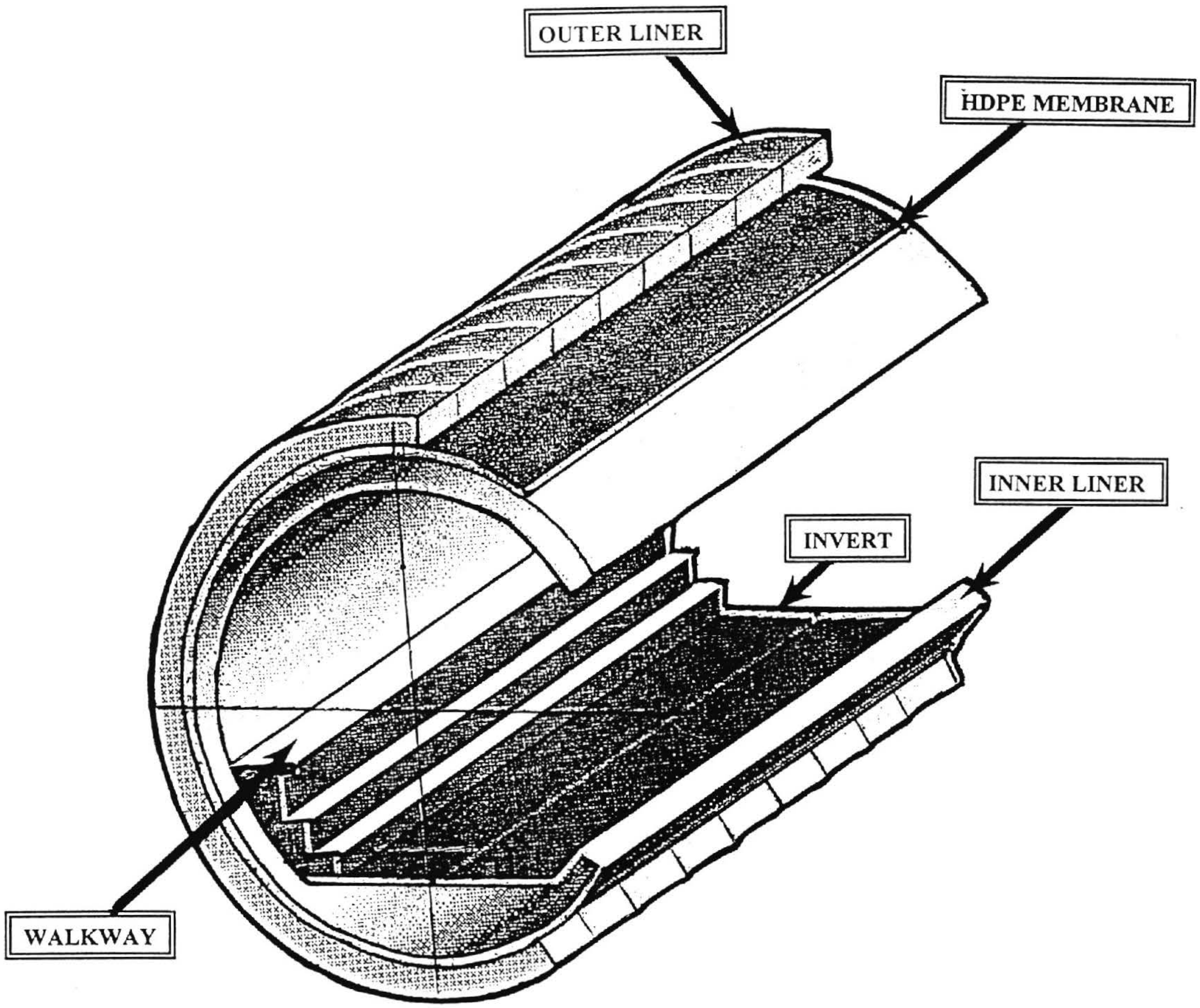

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FIGURE 4-6
POURED-IN-PLACE INNER TUNNEL LINER

for track installation. Functioning as supply conduits for the delivery of concrete, these drop holes would be placed at convenient intervals along the alignment within the public right-of-way, thus precluding the need to continuously shuttle concrete from tunnel openings to the working area of the tunnel. Following these activities, the track bed would be constructed and other finishing work would be completed.

Full street closures would not be required during tunnel~~ing~~ boring activities. Some lane closures could be required for grouting, concrete pumping, or constructing emergency exits and vent shafts. Lane closures would not exceed two weeks at any given location.

The tunnel boring machines would generally operate 6 to 7 days per week, 24 hours per day.[4] Excavated material would be removed and transported from the tunnel face by one of two possible ways. If the Slurry TBM is used, excavated materials would be removed from the tunnel by the slurry delivery, removal and treatment system discussed earlier and illustrated in Figure 4-3. If the EPB TBM is used, excavated material would be removed by a conveyor system or loaded onto muck trains within the tunnel. The trains or conveyors would then haul the muck back to the Pico/ ~~San Vicente Station site~~ or ~~the~~ Venice/San Vicente Station site where the muck would be placed in separate piles, one for "clean" soils, the other for soils requiring treatment before reuse or disposal.

Table 4-4 estimates the amount of material that would be excavated from each tunnel segment and the associated truck loads/trips necessary to remove this material from the site.

As stated above, tunneling activity could be conducted 24 hours per day. However, because the project is located in a residential area, it is assumed that trucking of excavated material would be restricted to occur between 7:00 a.m. and 8:00 p.m.

The types of equipment used to excavate and construct the tunnel are identified in the first table (H-1) in Appendix H.

During excavation and construction of each tunnel segment, approximately 30 workers would be required for each ~~of the day, evening, and nighttime~~ shift.

The removal of the outer cylindrical skin or "shield" of the tunnel boring machines immediately west of the Wilshire Boulevard/Western Avenue Station can be handled in one of two ways. One option would be to remove the shield for each tunneling machine from its excavated tunnel by digging a shaft from the street above down to the tunnel and extracting each shield via cranes. This operation would require that the contractor excavate a shaft in Wilshire Boulevard over the centerline of each tunnel at the interface point of the Mid-City Extension and the completed Wilshire/Western Station one block west of the intersection of Wilshire Boulevard and Western Avenue. Construction of these shafts would require temporary lane closures on Wilshire Boulevard for approximately two months, and possibly a short duration (1 day) full closure during the actual shield extraction operation. In this scenario the contractor might choose to remove other portions of the tunneling machines from the shafts as well.

The contractors' other option would be to "bury" the shield. In this scenario the contractor would make no effort to extract the shield from the excavated tunnel, but would leave it in place, constructing a special cast in place concrete liner later within this area. In this scenario the contractor would remove the inner portions of the

[4/] Specific mitigation measures provided in Section 7 of this document may limit the time the tunnel boring machines are in operation.

Table 4-4
Estimated Quantities of Material Excavated From Each Tunnel Alternative

Alignment Segment	Quantity of Excavated Material (cubic yards)[1]	Total Number of Truckloads[2]	Maximum Number of Truckloads Removed per day
Alternative A			
North tunnel segment[3]	151,400	8,400	60
Olympic/Arlington cut-and-cover station	93,600	5,200	130[4]
South tunnel segment[3]	145,300	8,100	60
Pico cut-and-cover and station at Pico/San Vicente	536,200	29,800	370
Total Alternative A	**926,500**	**51,500**	**NA**
Alternatives B1, B2			
North tunnel segment[3]	151,400	8,400	60
Olympic/Arlington cut-and-cover station	93,600	5,200	130[4]
South tunnel segment[3]	218,500	12,100	60
Venice/San Vicente cut-and-cover lower elevation station (Alt. B1)	296,400	16,500	400
Total Alternative B1	**759,900**	**42,200**	**NA**
Venice/San Vicente cut-and-cover higher elevation station (Alt. B2)	258,100	14,300	400
Total Alternative B2	**721,600**	**40,000**	**NA**
Alternative C			
North tunnel segment[3]	116,000	6,450	60
Cut-and-cover segment and station along Crenshaw Boulevard	175,000	9,700	175
South tunnel segment[3]	58,000	3,400	60
Pico cut-and-cover and station at Pico/San Vicente	536,200	29,800	370
Total Alternative C	**885,200**	**49,350**	**NA**

1. These estimates include a 1.3 expansion factor associated with handling.
2. Assumes that each haul truck could haul up to 18 cubic yards.
3. Assumes that 30 feet of tunnel is dug each day. These reflect one-way trips from the site, for total daily trips into and out of the site, multiply one-way trips by two.
4. Assumes one truck every five minutes, eleven hours a day.

tunneling machines by disassembling them and hauling them back to the Pico/San Vicente or Venice/San Vicente portal sites.

4.1.6 Cut-and-Cover Tunnel Segments

Alternative A includes two segments that require cut-and-cover construction for shallow tunnels and stations: a) an approximate 600-foot segment beneath Arlington Avenue for the Olympic/Arlington Station, and b) an approximate 1,700-foot segment beneath Pico Boulevard between Victoria Avenue and West Boulevard. ~~and into The Pico/San Vicente site, including the crossover track, station box and tail tracks would be constructed within an open trench approximately 1,000 feet long. Tail track is a section of track at the end of a line used for train storage and to provide extra breaking distance beyond the station.~~ Cut-and-cover construction activities would include: a) installation of soldier piles, b) placement of a deck over the street area to be disturbed, c) excavation and support of a shaft, d) installation of cut-and-cover support and excavation of cut-and-cover section, e) construction of line segments and stations, and f) street restoration.

Alternatives B1 and B2 includes two segments within the alignment that require cut-and-cover construction activities for shallow tunnels and one station: an approximate 600-foot segment beneath Arlington Avenue for the Olympic/Arlington Station, and an approximate 1,920-foot segment beneath Venice Boulevard between Victoria Avenue and ~~onto~~ the Venice/San Vicente site. The Venice/San Vicente Station site is not a part of the cut-and-cover tunnel construction activity. ~~stations and the tail tracks beyond the station are open to the air either in a trench at a lower elevation (Alternative B1) or on a berm at a higher elevation (Alternative B2).~~ Cut-and-cover tunnel construction would include the same activities as described for Alternative A.

Alternative C includes two segments that require cut-and-cover construction for shallow tunnels and stations: an approximately 3,700-foot segment beneath Crenshaw Boulevard including the Olympic/Crenshaw Station, and an approximate 1,700-foot segment beneath Pico Boulevard that is the same as described above for Alternative A ~~and into the Pico/San Vicente site (including the station and tail tracks beyond the station)~~. Along Crenshaw Boulevard, it is anticipated that the cut-and-cover segment would be divided into about six 600-foot subsegments due to its extended length. The series of construction steps identified above would first occur within the northernmost subsegment. When this subsegment is complete, or nearly complete, the series would begin again within the adjacent subsegment. In this manner, construction activity would "move" south along Crenshaw Boulevard. This method would enable reuse of certain construction materials, primarily decking and decking support, thereby reducing the total quantity of materials purchased for the project. For purposes of this analysis, it is assumed that the two cut-and-cover segments would be constructed simultaneously. Cut-and-cover tunnel construction would include the same activities as described for Alternative A.

The Pico/San Vicente site (Alternatives A and C), including the crossover track, station box and tail tracks would be constructed within an open trench approximately 1,000 feet long. Crossover track allows a train to switch from one set of tracks to another. Tail track is a section of track at the end of a line used for train storage and to provide extra breaking distance beyond the station. ~~For the cut-and-cover segment associated with the Pico/ San Vicente Station site, each of the steps listed above would generally occur once along the full length of the segment.~~ The off-street portions of this segment would be constructed using an open-cut technique, which is similar to cut-and-cover except that the excavated area is not covered while construction activities are occurring. ~~Along Crenshaw Boulevard, it is anticipated that the cut-and-cover segment would be divided into about six 600-foot subsegments due to its extended length. The series of construction steps identified above would first occur within the northernmost subsegment. When this subsegment is complete, or nearly complete, the series would begin again within the adjacent subsegment. In this manner, construction activity would "move" south along Crenshaw Boulevard. This method would enable reuse of certain construction materials, primarily decking and~~

~~decking support, thereby reducing the total quantity of materials purchased for the project. For purposes of this analysis, it is assumed that the two cut-and-cover segments would be constructed simultaneously.~~

Locating Utilities and Installation of Soldier Piles

The first step in cut-and-cover construction would be to locate all existing utilities in the area where the excavation support structures would be installed. This is done by digging exploratory trenches in those areas where the subsurface facilities are known to exist and by potholing (digging a hole) to locate the many service connections to buildings located adjacent to the site. Next soldier pile locations would be chosen. These piles are used to support deck beams and are also part of the cut-and-cover support system. ~~In order to avoid high noise levels associated with pile-driving,~~ Holes would first be drilled prior to the placement of piles. This process is shown in Figures 4-7 and 4-8. Equipment required for installation of soldier piles includes a pile drilling rig, a crane to place the piles in the holes, a front-end loader, concrete trucks, and backfilling equipment. Piles are generally spaced an equal distance apart, ~~Pile separation would be~~ typically six-to-eight feet, but spacing could vary to avoid ~~is varied so that~~ conflicts with utilities ~~are avoided to the maximum extent possible~~. Beginning at one end of a pile line, holes for the soldier piles would be predrilled at the selected locations with an oversized auger to an elevation below the base slab of the transit structure. A typical auger size is 36 inches in diameter. Pile installation closely follows behind the drilling operation, the bottom of the pile being set in concrete to provide a firm anchorage. The process would then be repeated along the other pile lines. During installation of soldier piles along Crenshaw Boulevard, it would be necessary to close two lanes on the same side of the street where the drilling would occur. This would reduce traffic to one lane in each direction.

Deck Installation

When soldier piles are in place on both sides of the station, a temporary surface known as decking would be constructed over the cut-and-cover site at the level of the existing street. Required as a mitigation measure for the proposed project, the primary function of the decking is to provide a temporary means for vehicles and pedestrians to continue traversing the area. Below the surface, the deck structure provides a means of supporting utilities in place while construction continues beneath. Portions of the decked area may also have the potential to be used for the temporary storage of construction equipment.

In the past, the MTA has used wood or concrete decking that is raised slightly above the level of the street. The wooden decking creates a bumpy driving surface and aesthetic concerns. The raised decking results in grade separations where streets cross the decking ~~have caused problems for drivers~~. For the Mid-City Segment, concrete decks that would set approximately flush with the existing street or sidewalk levels would be used ~~for the Mid-City Segment~~. Prior to installing the decking, trenches would be excavated across the street at approximately 15-foot spacing to permit installation of deck beams. These trenches are generally excavated during the night and covered to permit normal traffic flow during the day. When a sufficient number of deck beams have been installed, a shallow excavation of approximately 4 to 6 feet in depth is made between the deck beams and the decking is placed on the beams. Generally, street pavement and the subsoil would be excavated in increments while transverse steel beams are installed between the pile lines to provide support for the decking. When a substantial deck area is in place, excavation would continue underneath the decking until the subsurface utilities are exposed. Support facilities would then be placed around the utilities and would be attached to the deck structure. A typical roadway segment with decking installed is illustrated in Figure 4-9.

Because the decking and utility supports are interrelated, it is usually the contractor's responsibility to design the supports based on standards specified by the utility owners. Close coordination and cooperation is needed between the transit contractor and the utility owners so that construction would continue in a timely manner.

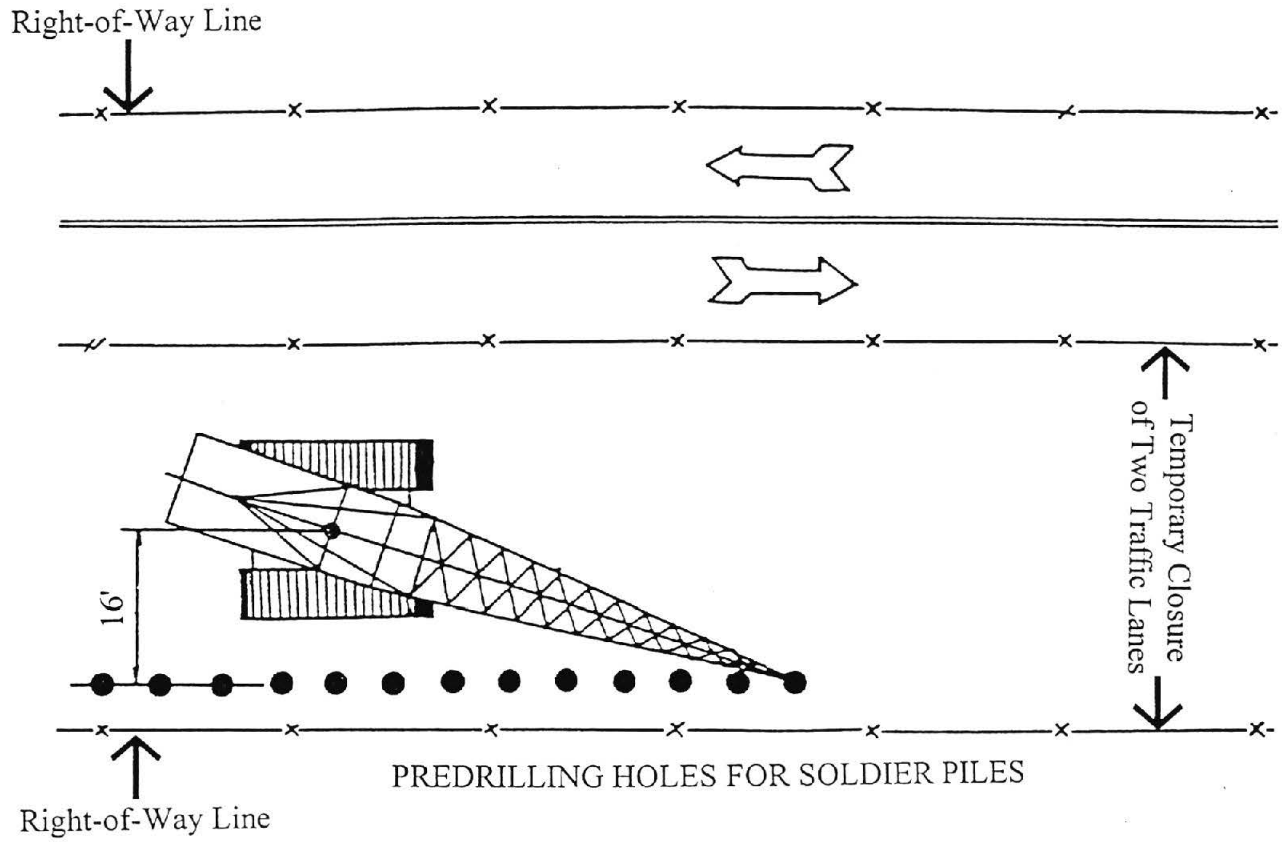

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FIGURE 4-7
AERIAL VIEW OF SURFACE OPERATIONS

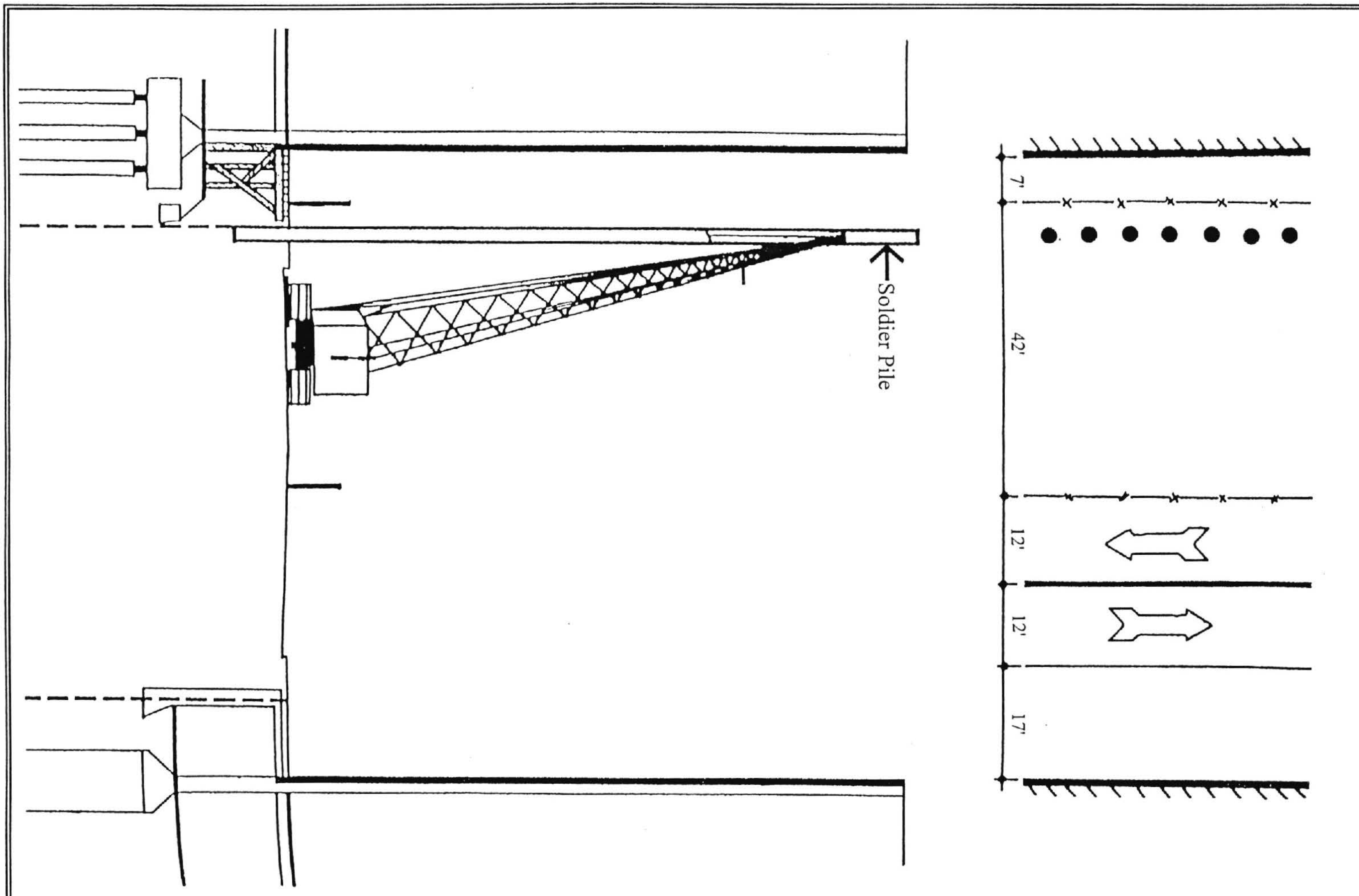

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FIGURE 4-8
INSTALLATION OF SOLDIER PILES

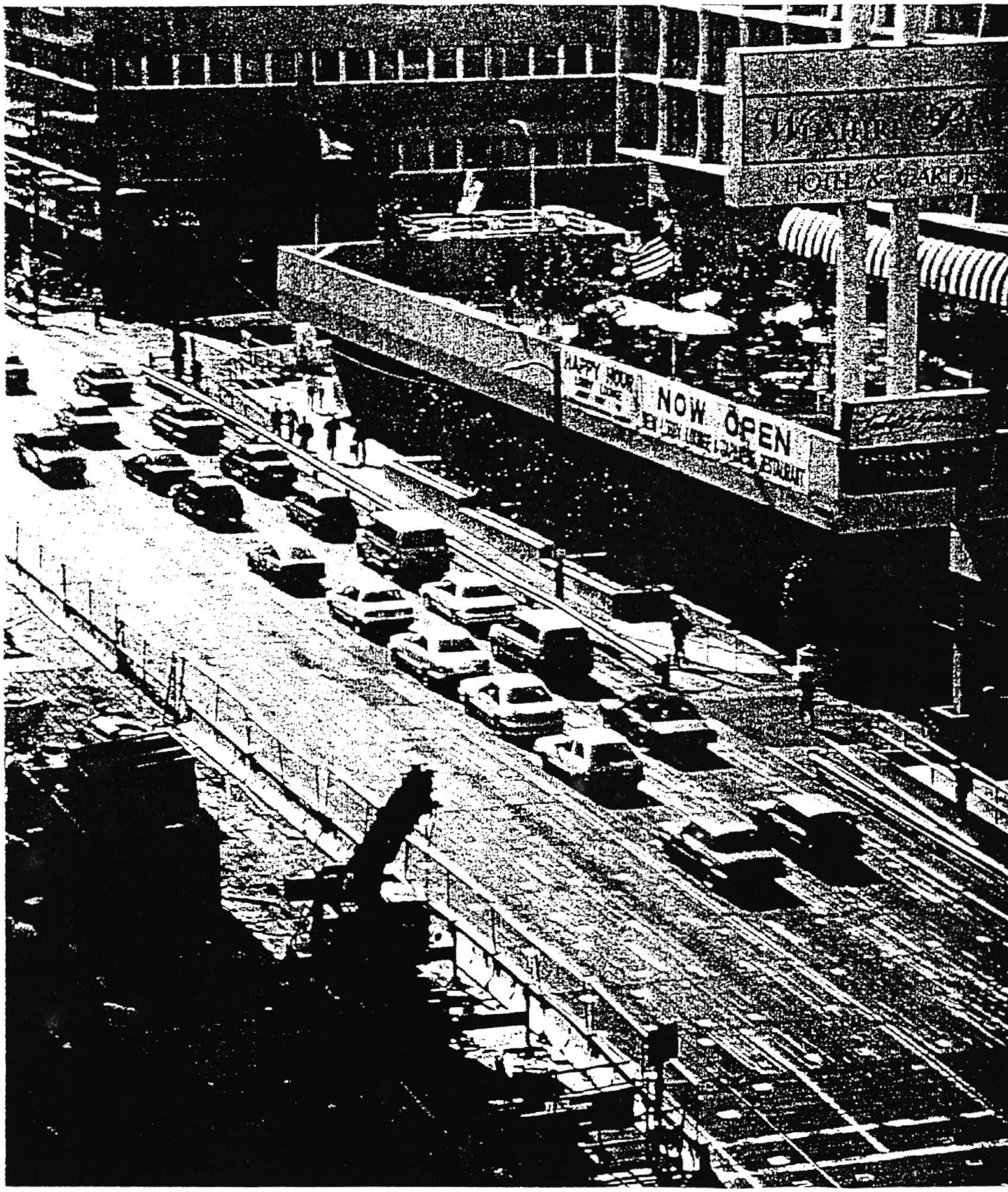

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FIGURE 4-9
ROADWAY SEGMENT WITH RAISED DECKING INSTALLED

It is important that the utility owners monitor the support installation so that the work would be done safely and without damaging the facilities.

As no two sites are the same and because the depth, condition, and location of some utilities may not be known until they are exposed, support structures for utilities are often unique to each particular situation. As a result, much of the support system would be field fabricated. Adequacy of the supports would be ensured by specifying requirements for spacing, materials, capacity and rigidity and by using standard drawings showing approved support methods for each type of utility. Where utilities are relatively new, it is often practical to support them completely in place with little modification. Examples would be pressurized and nonpressurized pipe systems using continuous steel pipe or rubber gasket pipe joints, and concrete-encased duct systems where the concrete is in good condition. In cases where utilities are old and have deteriorated, they may be unsuitable for supporting in place without some form of strengthening. Nonpressurized pipe systems, tile ducts, and concrete-encased ducts may be encased with heavy boards or plywood and banded. For the older pipe systems having rigid joint packing, such as mortar or lead, the complete facility must be replaced with an appropriate material that may then be supported. Such replacements must be suitable for reburial or may serve for the construction phase only. For deteriorated conduit systems, an alternative would be to remove the concrete and conduits and support the cables in a tray or re-encase them using split plastic duct that is later encased in concrete during the street restoration phase.

In most cases, the stresses produced in a utility by overlying soil, pavement, and traffic loads are much greater than the stresses that result when the facility is suspended from a suitably designed support system. Thus, provided proper care is exercised in the exposure, support, and reburial, the utilities would have adequate strength to be supported in place. However, support would place utilities at some risk for the duration of construction, especially during those phases of the work when construction machinery is operating nearby. This danger would be reduced by building additional protection into the support structure of critical facilities. By establishing controlled procedures for exposure, handling and reburial of utilities and including such procedures in the contract documents, the work would be safely and promptly performed.

~~It should be noted that there are areas of construction where decking is not needed above the excavation.~~

Deck installation would require limited street closures along Arlington Avenue and Pico Boulevard (Alternative A), along Arlington Avenue and Venice Boulevard (Alternative B), and Crenshaw and Pico Boulevards (Alternative C). Cross-streets along Pico Boulevard between Victoria Avenue and the Pico/San Vicente site would also require some closures (Alternatives A and C). Cross-streets along the cut-and-cover construction area within Crenshaw Boulevard between 8th Street to the north and Pico Boulevard to the south would also require some closures (Alternative C). To the extent possible, MTA would try to limit these to partial closures and maintain some traffic flow along affected streets. However, there would ~~may~~ be instances where this would not be possible and full street closures could occur occasionally. The following provides possible scenarios for street closures affected by cut-and-cover activity:

Alternative A (Wilton/Arlington/Pico)

- Arlington Avenue from just south of Olympic Boulevard to a point approximately 600 ~~537~~ feet to the south would be partially closed while the deck is being installed. Short-term full closures would be required for installing the deck beams that support the concrete decking.

- Pico Boulevard from Victoria Avenue through West Boulevard (1,500 feet) would be at least partially closed while the deck is being installed. Short-term full closures would be required for installing the deck beams that support the concrete decking.

- The intersections of Pico Boulevard with Victoria Avenue, Windsor Boulevard, Plymouth Boulevard, Lucerne Boulevard, Queen Anne Place, and West Boulevard would be closed while a deck is installed across each ~~the~~ intersection.

Alternative B (Wilton/Arlington/Venice)

- Arlington Avenue from just south of Olympic Boulevard to a point approximately 537 feet to the south would be partially closed while the deck is being installed. Short-term full closures would be required for installing the deck beams that support the concrete decking.

- Venice Boulevard from Victoria Avenue through the Venice/San Vicente Station (approximately 1,900 feet) would be at least partially closed while the deck is being installed. Short-term full closures would be required for installing the deck beams that support the concrete decking.

Alternative C (Crenshaw/Pico)

- Along Crenshaw Boulevard, decking would be installed one subsegment at a time, beginning at the north end and moving south as construction of each subsegment is completed. The installation of decking would require closure of Crenshaw Boulevard. A mitigation measure has been added to the project, if necessary, to conduct these activities at night or during weekends to minimize traffic disruption during the day or on weekends to limit impacts to weekday traffic patterns. Short-term full closures would be required for installing the deck beams that support the concrete decking.

- Olympic Boulevard, 8th Street, 9th Street, and Country Club Drive would each be closed to allow for installation of the deck along Crenshaw Boulevard.

- Pico Boulevard from about Victoria Avenue to West Boulevard would be at least partially closed while the deck is being installed. Short-term full closures would be required for installing the deck beams that support the concrete decking.

- The intersections of Pico Boulevard with Victoria Avenue, Windsor Boulevard, Plymouth Boulevard, Lucerne Boulevard, Queen Anne Place, and West Boulevard would be closed while a deck is installed across the intersection.

Excavation and Support

A soldier pile and timber lagging or shotcrete lagging sheeting system would be used as support during excavation of the cut-and-cover segment. Excavation support systems, in conjunction with proper excavation and bracing procedures, would be used to protect adjacent structures. During construction, MTA would monitor adjacent buildings.

When the decking is in place and the utilities are supported, excavation would proceed rapidly using heavy earthmoving equipment operating beneath the deck. The deck would be constructed of panels that are easily removed to create an opening for spoil removal and materials delivery. There is also an access shaft that is excavated from the construction staging area that provides an opening for spoil removal and material delivery. As excavation proceeds, transverse steel struts would be installed at various depths to brace the soldier piles against lateral earth thrust, as shown on Figure 4-10. Another possible excavation support method is the use of tiebacks drilled into the sides of the excavation. With the excavation complete, construction would proceed with little effect on the utilities supported above. Station construction may commence whenever excavation in

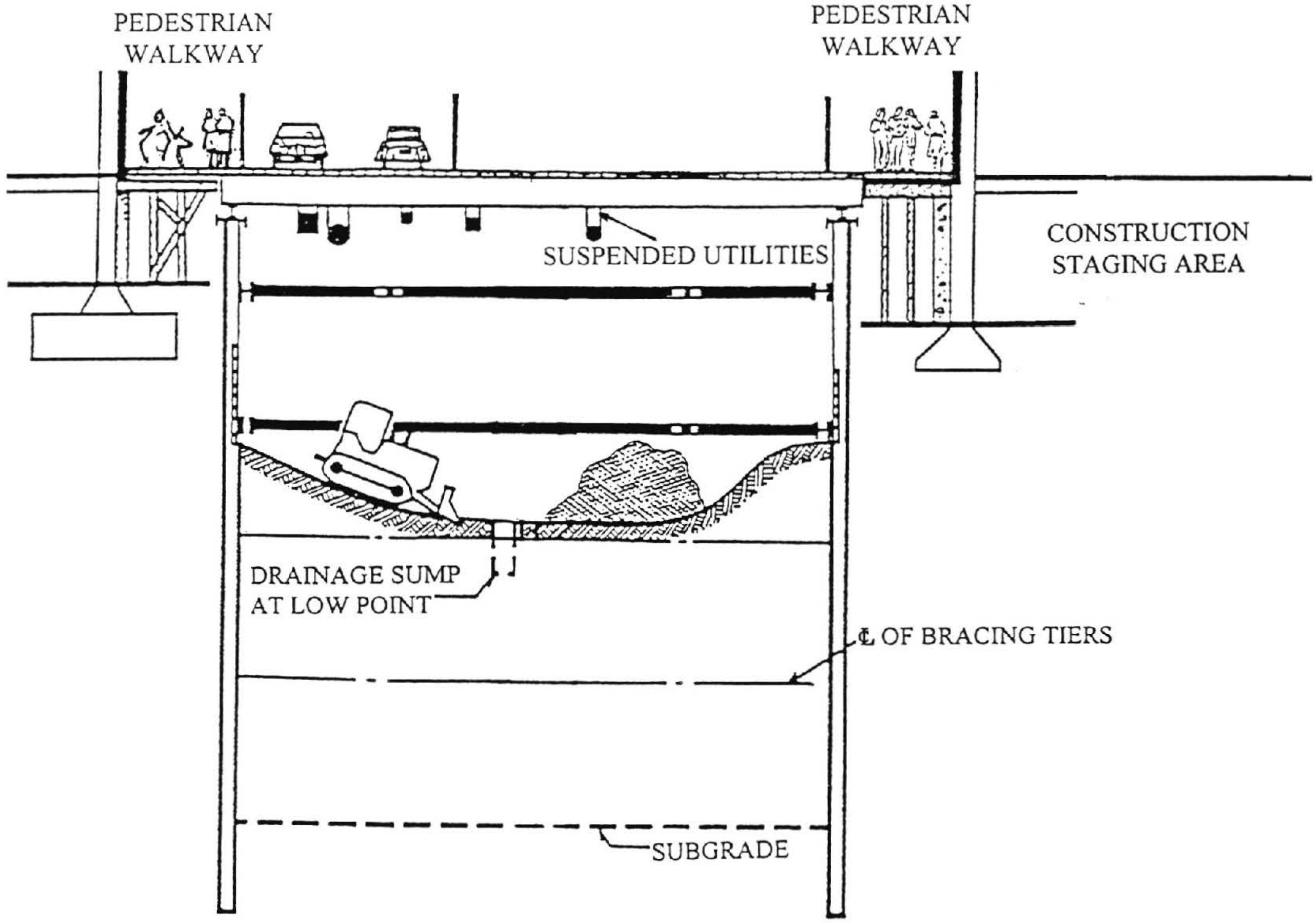

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FIGURE 4-10
CONCEPTUAL STATION EXCAVATION AND BRACING

an area is complete. Frequently, work on a portion of the station structure would begin while the excavation continues elsewhere.

The concrete invert slab of the station (see Figure 4-6) would be generally poured in panels that are the full width of the structure and some 30 to 50 feet in length. The outside walls would be formed directly against the soldier piles and lagging[5] and, as sections of the structure are complete, the transverse steel beams would be removed, as shown on Figure 4-11. Station entrances would be generally outside public rights-of-way. Though few utilities would be encountered in entrance areas, those that do exist must be completely relocated clear of the site.

~~A soldier pile and timber lagging or shotcrete lagging sheeting system would be used as support during excavation of the cut-and-cover segment. Excavation support systems, in conjunction with proper excavation and bracing procedures, would be used to protect adjacent structures. During construction, MTA would monitor adjacent buildings for movement and, if movement is detected, take action to control the movement.~~

Soil is typically excavated using bulldozers or loaders. Excavated material from the cut-and-cover segments described above would be placed in piles at the construction staging areas. "Clean" soils and soils requiring treatment/special disposal would be placed in separate piles. Generally, a large rubber-tired front-end loader would be used to remove the soil from the piles and place it into trucks at the construction staging areas. The contractor could choose to use an alternative method to load the excavated soil onto the trucks at the construction staging area. For example, a front-end loader could place the soil in a receiving hopper that loads a conveyor that transports and places the soil in a loading hopper that places the soil in the truck. This method allows the front-end loader/operator to continue to work independent of the truck activity.

Excavation would occur beneath the street decking, and therefore, would not require major street closures. Access to cut-and-cover sections would be provided via shafts or open cut ramps at the construction work areas. The table included in Appendix H identifies the types and quantities of equipment that would be used during excavation of the cut-and-cover segments. ~~Excavation would occur during a daytime shift and would involve about 30 workers.~~ During excavation and construction of each tunnel segment, approximately 30 workers would be required for each shift. The quantities of material excavated from cut-and-cover segments and the associated number of truckloads removed from the site are provided in Table 4-4 above.

Street Restoration/Site Restoration

After the ~~shallow tunnel and~~ station structures have been completed and the roof slab has been allowed to cure, decking and deck beams would be removed and backfilling would begin. During backfilling operations, utilities would be placed in their permanent locations.

The Arlington Avenue cut-and-cover segment would be backfilled as one construction activity (Alternatives A, B1, and B2). Along the Crenshaw Boulevard cut-and-cover segment, each 600-foot subsegment would be backfilled as that subsegment is completed (Alternative C). Backfilling along the cut-and-cover section beneath Pico Boulevard would likely occur in two segments (Alternatives A and C). Backfilling along the cut-and-cover section beneath Venice Boulevard would likely occur in three segments (Alternatives B1 and B2). Street restoration would require at least partial closure of each of the six 600-foot subsegments along Crenshaw Boulevard, Pico Boulevard, Venice Boulevard, and affected cross streets for limited durations. Full street

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[5/] Lagging is planks made of timber or shotcrete that are placed one on top of the other between the soldier piles to prevent rocks or dirt from falling into the excavated area.

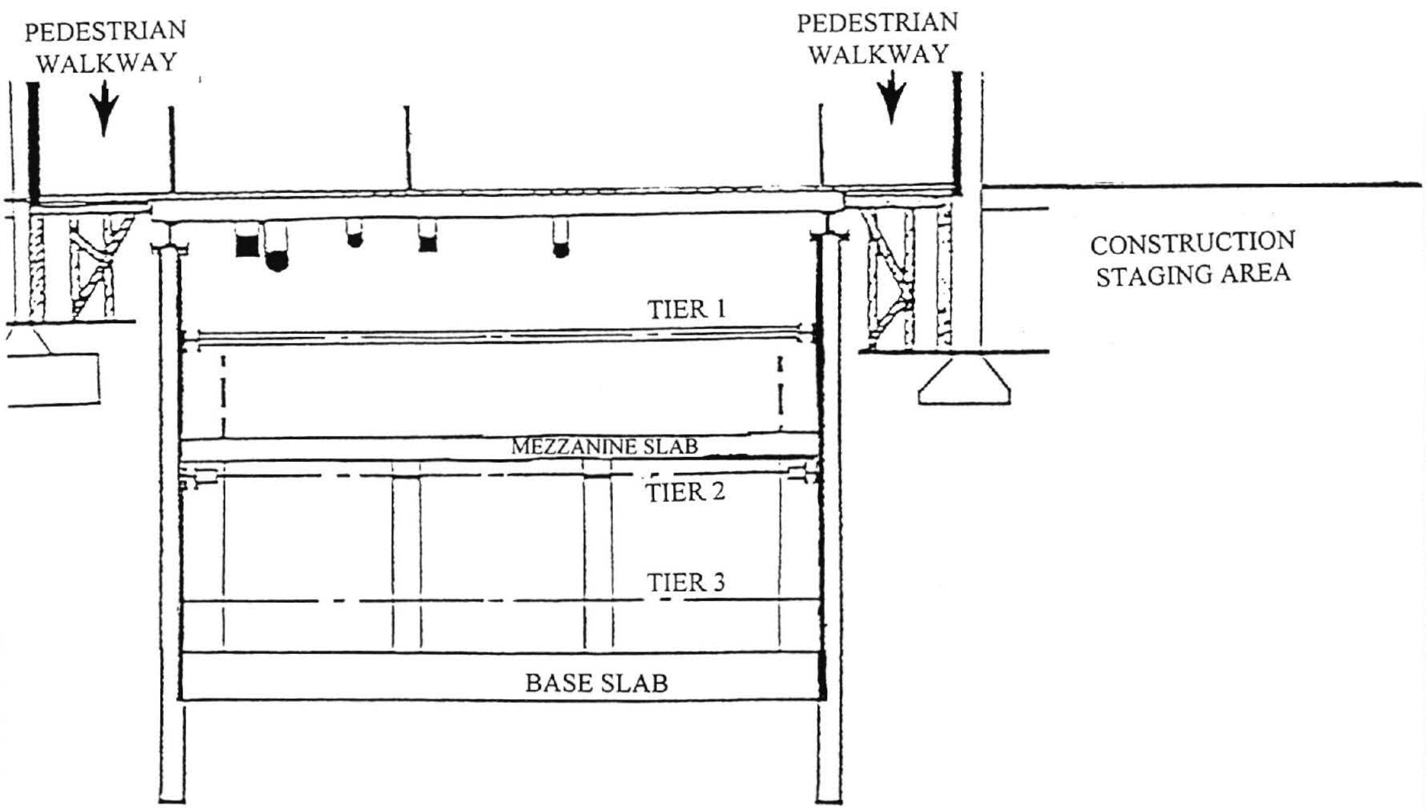

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FIGURE 4-11
STRUCTURE INSTALLATION AND BRACING REMOVAL

closures would be required for removal of the deck support beams that span from one side of the street to the other. Backfill for utility relocations (Alternative C) would be accomplished in the same manner.

When roadway repavement is complete, full traffic flow would be restored and activity involving station finishes and equipment installations would continue beneath the surface. These would involve minimal disruption to street use by vehicles and pedestrians.

When the station shell is complete, backfilling material would be placed and compacted in layers beneath the deck structure to the highest elevation practical using large rollers. Above this elevation, sections of the decking must be removed to allow backfilling to progress. Material would be carefully tamped around the supported utility structures and any new facilities would be installed in trenches cut into the new backfill in the normal manner. Hangers and other support structures would be disconnected from the deck structure and removed after the utilities are safely supported by the backfill soil.

When ~~the~~ completion of the work allows, the transverse deck beams would be removed and the soldier piles would be exposed and cut off approximately 10 ~~6~~ feet below the final in-street grade, and approximately 6 feet below in off-street locations. Concurrent with these latter stages of restoration, permanent utility services would be connected and manholes, sidewalk vaults, meters, and valves would be rebuilt at their proper locations. The final step would be the installation of street pavement and sidewalks, at which time storm drain inlets would be completed, covers for manholes, vaults and valve boxes, and fire hydrants would be set to grade, and permanent street lighting, signals, and signage would be installed.

4.2 Stations

4.2.1 Underground Stations

Construction of the shallow cut-and-cover stations would begin with pouring the concrete ~~of the~~ station floor, also known as the invert or base slab. After a reasonable length of continuous base slab has been completed, the exterior walls, intermediate level floors and roof would be installed. Each of these components includes reinforcing steel and poured-in-place concrete. Station entrances are generally used as access points to the underground station during the construction process. Full street closures would not be required during this stage of construction but intermittent lane closures could occur. Exterior entrances would be constructed after the main station box construction is well under way.

The table provided in Appendix H identifies equipment used during construction of cut-and-cover tunnel segments. Flat-bed carriers transport materials to the work site. Cranes lower rebar and other materials into the construction site. Ready-mix trucks bring concrete to the work site and dump either by chutes to the pour area or into inlet hoppers for concrete pumps. This would involve some lane closures. Construction of cut-and-cover structures would occur primarily during a daytime shift. Approximately 30 workers would be required at the site.

Olympic/Arlington Station

The Olympic/Arlington Station (Alternatives A and B) would be a two-level underground station very similar to others that have been built on other segments of the Red Line. The station would be constructed utilizing cut-and-cover construction techniques. The station itself would be constructed beneath Arlington Avenue immediately to the south of Olympic Boulevard. The Olympic/Arlington Station would be a two-level underground reinforced concrete box structure. The dimensions of the station box would be approximately 60 feet wide by 57 feet high by 537 feet long. Once constructed, the top of the station would be approximately 5-10 feet below the street surface. The construction sequence would include advance utility relocation, auguring and installation of soldier piles within the public right-of-way following along each curb line for the length of the station, installation of deck beams between the soldier piles across the width of Arlington Avenue, installation of pre-cast concrete deck panels between the deck beams, and excavation of the station beneath the decking as traffic flows on the deck. This sequence is typical of conventional cut-and-cover construction.

Olympic/Crenshaw Station

The Olympic/Crenshaw Station (Alternative C) would be a one-level, side platform underground station. The station would be constructed utilizing cut-and-cover construction techniques. The station itself would be constructed beneath Crenshaw Boulevard at its intersection with Olympic Boulevard. The dimensions of the station box would be approximately 60 feet wide by 40 feet high by 530 feet long. Once constructed, the top of the station would be just below the street surface. The cut-and-cover construction sequence would be the same as described above for the Olympic/Arlington Station. ~~include advance utility relocation, auguring and installation of soldier piles along each curb line for the length of the station, installation of deck beams between the soldier piles across the width of Crenshaw Boulevard, installation of pre-cast concrete deck panels between the deck beams, and excavation of the station beneath the decking as traffic flows on the deck. This sequence is typical of conventional cut-and-cover construction.~~ The entrance to the outbound tracks would be located at the southwest corner of the Olympic/Crenshaw Station. The entrance to the inbound tracks would be located at the northeast corner of the intersection. These entrances would be placed within plaza areas. An on-street area would be provided for bus and automobile interface. Ancillary facility areas (see Figure 2-8) would be constructed as part of the station at the southwest corner of the intersection and at both ends of the station platforms.

To minimize construction impacts to traffic, the removal of excavated material and the installation of concrete and reinforcing steel would generally not occur from the street through openings in the decking, but instead, would occur from off-street at the site of the station entrance structure. This would minimize construction impacts to traffic during these major operations. ~~Excavation of the Olympic/Arlington Station would not progress to the track level until the tunnels are completed between Olympic Boulevard and the Wilshire/Western Station. Once tunnel construction is completed then the station excavation can be advanced down to the track level and the sections of temporary tunnel which have been erected within the station limits can be removed.~~

Two ventilation structures would be constructed; one at the approximate mid-point between the Olympic/ Crenshaw and Wilshire/Western Stations, and one at the approximate mid-point between the Olympic/Crenshaw and Pico/San Vicente Stations. A final location for these ventilation structures would be selected during final design. It is assumed that one ventilation shaft would be located at the southwest corner of Norton Avenue and Wilshire Boulevard, and the second would be located on the northwest corner of Pico Boulevard and Victoria Avenue. The shaft structure would be rectangular, covering an approximate 10-by 20-foot-width and reaching a maximum height of 15 feet.

Pico/San Vicente Station

The Pico/San Vicente Station (Alternatives A and C)would be a single level underground reinforced concrete box structure to be constructed in an off street site owned by MTA immediately east of the intersection of Pico and San Vicente Boulevards. The dimensions of the station box would be approximately 60 feet wide by 26 feet high by 450 feet long. The station would be preceded by a 372 foot cross-over structure (allows the trains to switch from one track to another) and would be followed by a 500 foot tail track bringing the entire length of the structure to 1,322 feet. Once constructed, the top of the station would be approximately 5-10 feet below the street surface. The station would be constructed in an open cut from the surface in an off-street location. Station construction would be completed after tunnel construction ~~excavation~~ is completed.

4.2.2 Open-Air (Lower Elevation) Station (Alternative B1)

The Venice/San Vicente Open-Air (Lower Elevation) Station ~~option is an "open air" option which~~ would be constructed at an elevation that would place the rails approximately ten feet below the existing grade of the site. The station would be single level with a structure ~~canopy~~ for protection from the rain or direct sun. Fare collection would occur at the station area surface level. The dimensions of the station center-load platform would be approximately 60 feet wide by 26 feet high by 450 feet long. A bridge structure would span the tracks at the station to provide access to the center-load platform. The station would be proceeded by a 372 foot cross-over structure ~~(allows the trains to switch from one track to another)~~ and would be followed by a 500 foot tail track ~~(a section of track at the end of a line used for storage and to provide extra breaking distance)~~ bringing the entire length of the structure to 1,322 feet. The station would be constructed in an off-street location to be purchased by the MTA. The 500-foot tail track would be constructed within a concrete three-sided open trench structure.

4.2.3 Open-Air (Higher Elevation) Station (Alternative B2)

The Venice/San Vicente Open-Air (Higher Elevation) Station ~~option~~ would be constructed at an elevation that would place the rails approximately 5 feet above the existing grade. The higher site elevation would be built from fill material taken from excavation of the tunnel or from the Olympic/Arlington Station site. The station would be constructed the same as described above for Alternative B1. ~~protected by a canopy structure, and fare collection facilities would be at surface level in the station area. The dimensions of the station box would be approximately 60 feet wide by 26 feet high by 450 feet long. The station would be preceded by a 372 foot cross-over structure and would be followed by a 500 foot tail track bringing the entire length of the structure to 1,322 feet. The station would be constructed in an off-street location to be purchased by the MTA. The higher site elevation would end at the west end of the station and the 500-foot tail track would be supported by columns.~~

5.0 ESTIMATED PROJECT COSTS

The estimates presented in this section are based on an average annual capital inflation rate of 2.41% for Los Angeles County from 1997 to 2020. This information was from the August 1996 UCLA forecast of the County's capital inflation rate.

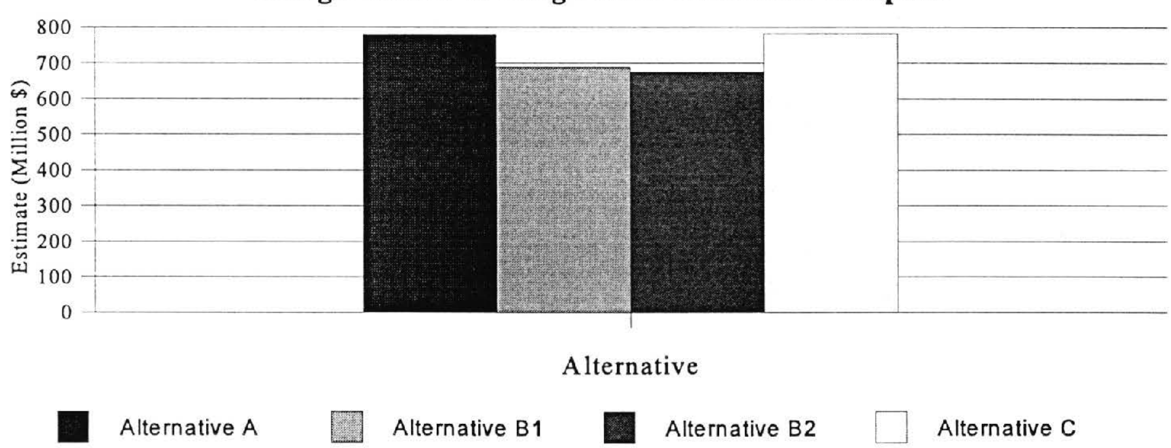
The Rough Order of Magnitude estimates are based on a Revenue Operation Date of July 2008, and include costs for real estate, professional services, and art for transit. This estimate assumes that MTA's ISTEA II request of $100 million would be ~~is~~ authorized and approved. The total cost for each of the four "build" alternatives is provided in Table 5-1. Table 5-2 displays these total costs in graphic form.

Table 5-1
Rough Order of Magnitude Estimates

Alternative	Description	Estimate
A	Wilton/Arlington/Pico Boulevard Approach to Pico/San Vicente Underground Station	$778,040,000
B1	Wilton/Arlington/Venice Boulevard Approach to Venice/San Vicente Open Air (Lower Elevation) Station	$688,200,000
B2	Wilton/Arlington/Venice Boulevard Approach to Venice/San Vicente Open Air (Higher Elevation) Station	$674,440,000
C	Crenshaw Boulevard/Pico Boulevard Approach to Pico/San Vicente Underground Station	$781,910,000

Table 5-2

Rough Order of Magnitude Estimates Graphic



6.0 RELATED PROJECTS

Section 15130 of the State CEQA Guidelines requires an analysis of cumulative impacts based on (1) a list of existing projects, projects under construction, approved projects, projects under formal review, and other "reasonably anticipated" future projects or (2) a summary of overall growth projections which evaluates regional or areawide conditions for the project planning area.

In assessing cumulative impacts, each section of this SEIS/SEIR considers overall growth projections or specific major projects planned for the project area as appropriate. This section contains a list of major projects that are likely to affect or be affected by the proposed project.

These projects are typically related to the proposed project in terms of their location and/or function. Growth projections for the area are discussed in Section 7.5.

6.1 Metro Red Line Western Extension

The Metro Red Line Western Extension is a planned westerly continuation of the Metro system from the terminus station proposed near the Pico Boulevard/San Vicente Boulevard intersection through Beverly Hills, Century City, and Westwood, with a terminus station to be located west of the Interstate 405 Freeway. The planning for this line has not yet commenced and will be conducted through a Major Investment Study that will consider a range of options. This extension is included in MTA's 1995 Long Range Transportation Plan (LRTP). The 1995 LRTP assumes that the extension will contain six stations and extend approximately 7.8 miles. It is assumed that it will contain a park-and-ride facility at the terminus station, west of the 405 freeway. The 1995 LRTP anticipates construction of this segment to begin in 2004 and completion by the year 2014, however, the 1995 LRTP is currently under revision and the dates will be moved further out into the future. The patronage estimates used in this document do not assume operation of the Metro Red Line Western Extension. MTA's predecessor Board took an action in 1992, when the original Mid-City LPA was adopted, to return to Wilshire Boulevard as soon as possible, after Mid-City.

The four "build" alternatives being evaluated in this document all have limitations as to how the Red Line could possibly be extended in a westerly direction. The alternative selected as the LPA for the Mid-City Segment of the Red Line would determine whether a potential future westerly extension from the Pico/Venice/San Vicente terminus station would be in an underground or aerial configuration.

Alternatives A and C have been designed to terminate in an underground station that would be parallel to and south of Pico Boulevard between San Vicente and West Boulevards. From this underground station the only westerly extension option available would be to proceed under Pico Boulevard and then turn the alignment in a northerly direction under private property on towards Wilshire Boulevard.

Alternative B1 has been designed to terminate in an open air station with 500 feet of tail track constructed at a "lower elevation" to allow for a potential future western underground extension of the Red Line ~~within a ten-foot deep trench. The 500 feet of tail track would also be constructed within a trench~~. This station and tail track would be parallel to and north of Venice Boulevard between San Vicente and West Boulevards. From this open air (lower elevation ~~within an trench~~) station the only westerly extension option available would be the same underground option that was described above for Alternatives A and C.

Alternative B2 has been designed to terminate in an open air station with 500 feet of tail track constructed at a "higher elevation" to allow for a potential future western aerial extension of the Red Line ~~on a berm~~. The 500 feet of tail track would be constructed on columns. This station and tail track would be parallel to and north of Venice

Boulevard between San Vicente and West Boulevards. From this open air (higher elevation ~~on a berm~~) station the only westerly extension option available would be to continue the aerial alignment in a westerly direction within the median of San Vicente Boulevard. The aerial alignment would descend into an underground configuration ~~at a point several blocks~~ west of La Brea Avenue. This alignment would then continue on towards Wilshire Boulevard. The need for an aerial alternative would be to avoid the hydrogen sulfide gas problems that could potentially be encountered west of the Pico/San Vicente Boulevards intersection.

6.2 Crenshaw/Prairie Line

The Crenshaw/Prairie Corridor is a proposed 11-mile transit line intended to provide service along Crenshaw Boulevard and Prairie Avenue in the cities of Los Angeles, Inglewood, and Hawthorne. A Preliminary Planning Study was completed and approved by the MTA Board of Directors on January 26, 1994. A Major Investment Study (MIS) is currently underway and is investigating various light rail alignment options. The MIS is scheduled to be completed in the Fall of 1997.

The northern terminus station of the Crenshaw/Prairie Line would be located at the proposed Metro Red Line Venice/ or Pico/San Vicente Station site. The Crenshaw/Prairie Line would either extend south to the Metro Green Line's Hawthorne Boulevard Station, terminating at El Segundo Boulevard in the City of Hawthorne, or to the Los Angeles International Airport, via AT&AF right-of-way, or both. Figure 6-1 shows the conceptual alignments of the Crenshaw/Prairie Line.

The MTA Long Range Transportation Plan (LRTP) adopted in 1995 does not identify funds to construct the Crenshaw/Prairie Line. The MTA Board of Directors is conducting a formal review of the LRTP now, and is scheduled to update it for 1997. The new LRTP may make changes to the list of projects slated for construction to respond to changes in economic projections, transportation demand forecasts, and revised regional policies.

6.3 Mid-City Recovery Program

In response to direction by the City Council of the City of Los Angeles, the City of Los Angeles Community Redevelopment Agency (CRA) has begun planning revitalization and recovery efforts for areas affected by the April 29, 1992 civil unrest. The Mid-City Recovery Area is one of eight priority areas identified by the City Council. It is generally bounded by Pico Boulevard to the north, Western Avenue to the east, Jefferson Boulevard to the south, and Fairfax Avenue to the west. This area includes the proposed western terminus station site near the Pico/Venice~~ Boulevard~~/San Vicente Boulevards intersection. The objective of the proposed Mid-City Recovery Program is to stimulate positive community changes through reinvestment in predominantly commercial and industrial corridors within the greater Mid-City area. The CRA completed a Final Environmental Impact Report for the Mid-City Recovery Program in January 1996.

6.4 Other Projects Proposed Within the Project Vicinity

During the week of January 13-17, 1997, the records of the City of Los Angeles Planning Department and the Department of Transportation were searched for development projects within a ½ mile radius of the proposed alignments for the Metro Red Line Mid-City Segment. The results of this search are provided in Table 6-1 on the following page. As shown in this table, there are four related projects which could potentially result in cumulative impacts when added to the potential impacts of the proposed project.

The related projects described in Table 6-1 are shown on Figure 6-2.

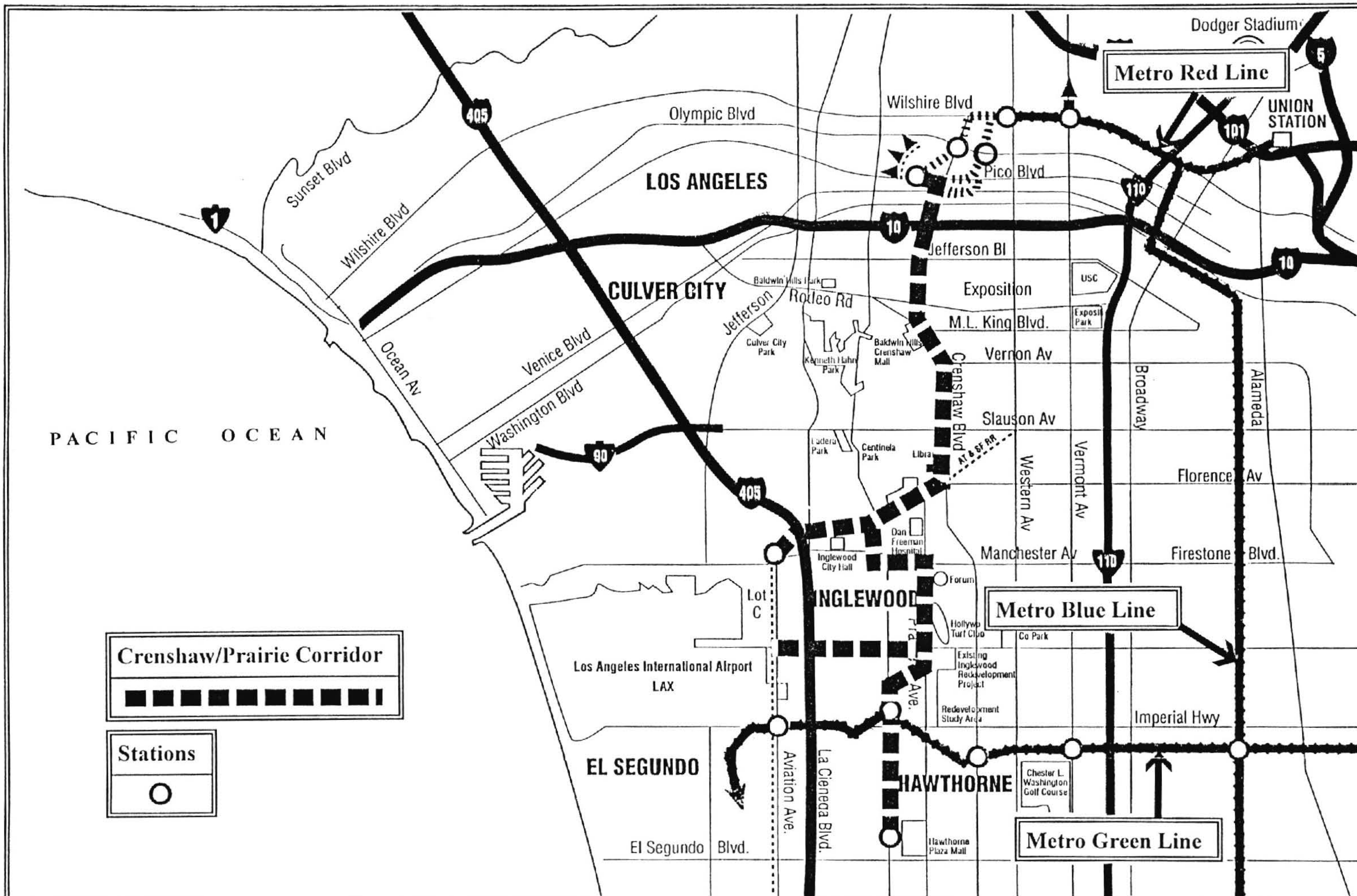


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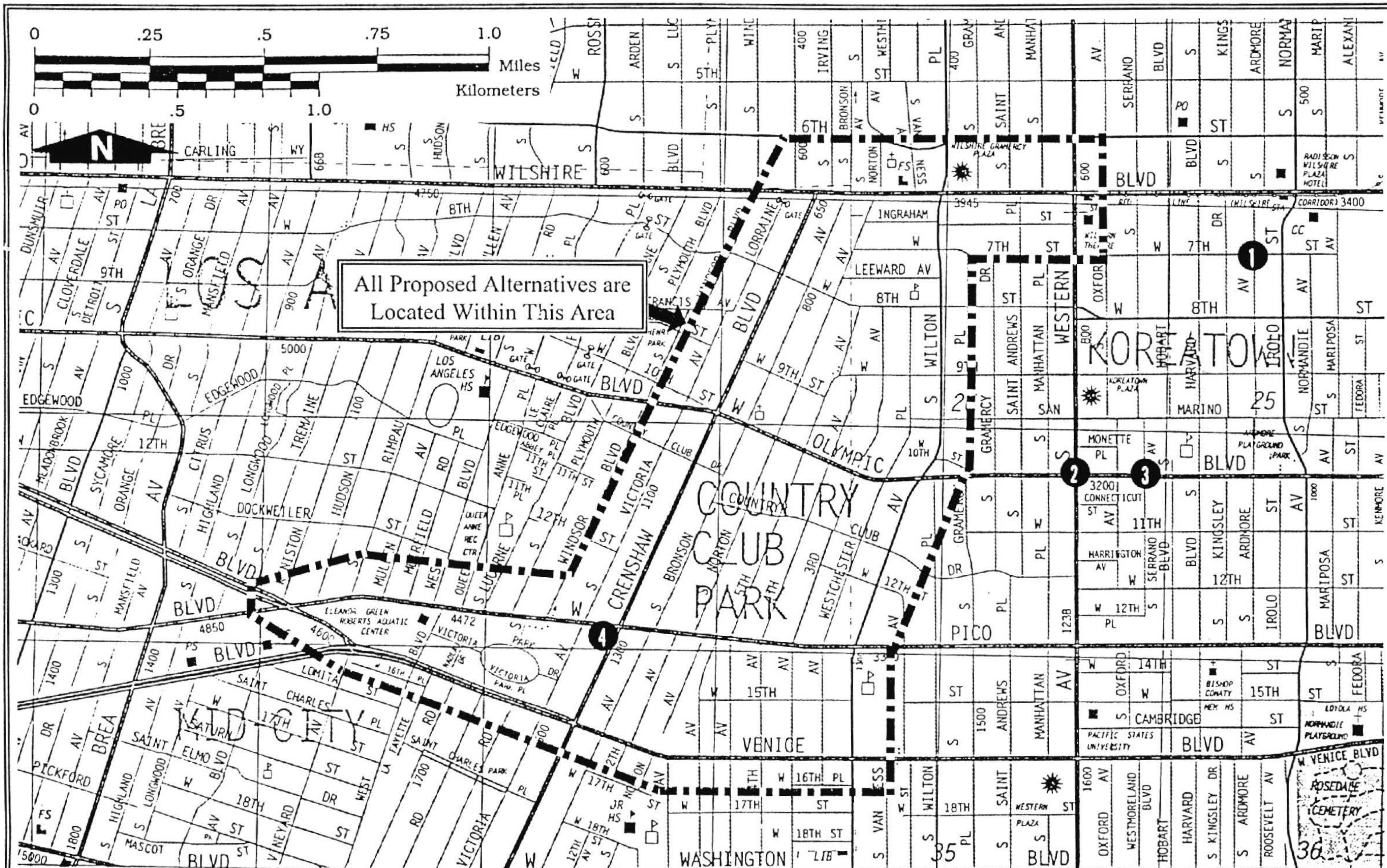
FIGURE 6-1
CONCEPTUAL ALIGNMENT OF THE CRENSHAW/PRAIRIE LINE

Table 6-1
Metro Red Line Mid-City Segment Related Projects List

Map No.[5]	Case No.[1]	Description	Address/Location	Status[2]	Current Use of Property
City of Los Angeles					
1	MND 90-0712-SUB	Tentative Tract Map No. 49798 16 unit condominium on .19 acres	700 South Ardmore Avenue Cross-street is 7th Street	Proposed	Vacant lot
2	EIR 91-0127-ZC/GPA CPC 91-0259 PPR[3] CPC 93-0214-HD[3] CPC 93-0163-HE[3] CPC 93-0078-ZC[3] ZA 93-0155-CUB[4]	General Plan Amendment and Zone Change for 25-story 587,470 sq. ft. mixed use (department store, bank, restaurant, office space, 230-room hotel) on 2.4 acres	1010 South Western Avenue Cross-street is Olympic Boulevard	Planned	Previous site use under demolition
3	MND 95-0078-CUC (ZV) CPC 95-0079[3]	Conditional use and zoning variance for 18,000 sq. ft. library on .71 acres	1011 South Serrano Avenue Cross-street is Olympic Boulevard	Planned	Vacant lot
4	MND 89-0954-CUZ (ZV) ZA 89-1140-CUZ (ZV)[4]	Conditional use and zoning variance for 28,000 sq. ft. shopping center	Southwest corner Pico Boulevard and Crenshaw Boulevard	Proposed	Vacant lot

Source:

1. Department of City Planning, Environmental Review Section Project Book and card files; and Department of Transportation, Initial Studies Project Book, January 15 and 16, 1997.
2. Based on case approvals/adoptions granted and field survey, January 15 and 16, 1997.
3. City Planning Department, Automated Records, January 17, 1997.
4. City Planning Department, Zoning Administration, January 17, 1997.
5. Located on Figure 6-2.



Note: See Table 6-1 for specific address information.

Base Map: Thomas Bros. Maps

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FIGURE 6-2
RELATED PROJECTS LOCATION MAP

7.0 ENVIRONMENTAL IMPACT ANALYSIS

7.1 TRANSIT AND PEDESTRIAN CIRCULATION

7.1.1 Environmental Setting

Existing Public Transit

The Mid-City area (project area) is currently being served by bus lines operated by Los Angeles County Metropolitan Transportation Authority (LACMTA), Los Angeles Department of Transportation (LADOT), and Santa Monica Municipal Bus Lines (SMMBL). The existing bus routes, with their operating schedules including headways (the time between bus arrivals at each stop), are described below and illustrated on Figure 7-1. A copy of each bus route map and schedule is provided in Appendix I.

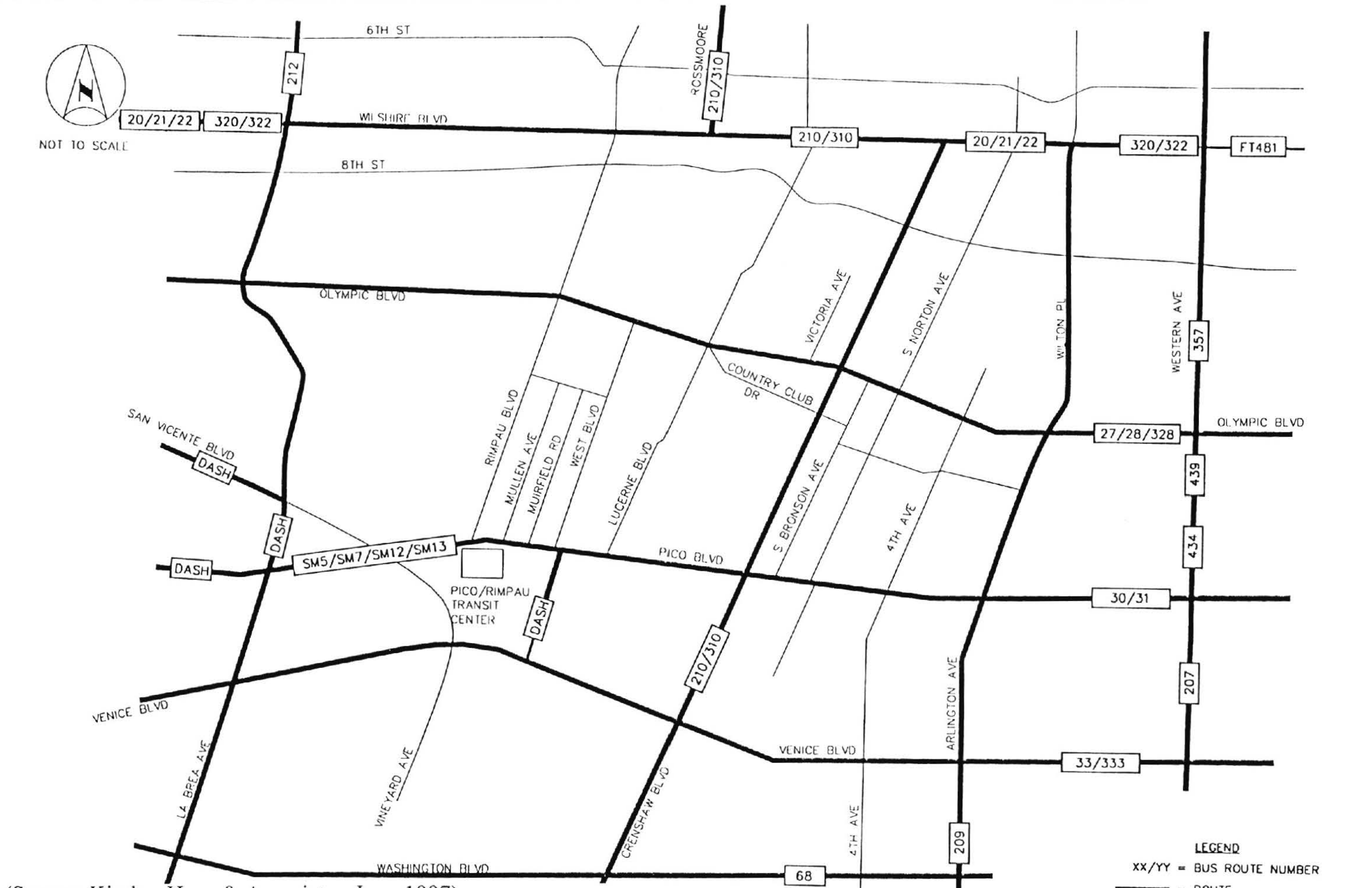
Los Angeles County Metropolitan Transportation Authority (MTA) Bus Lines

- MTA Line 30/31 - Within the project area Line 30/31 travels along Floral Drive from East Los Angeles College. It runs through Boyle Heights and downtown Los Angeles via First Street; continues south on Broadway until Pico Boulevard; then travels along Pico Boulevard until it reaches its western terminus at the Pico-Rimpau Transit Center. Line 30 runs 24 hours daily; Line 31 runs from 4:00 AM to midnight on weekdays, and 6:00 AM to midnight on weekends. Headways are generally three to fifteen minutes between 6:00 AM and 6:00 PM. Passengers who wish to continue to the west generally transfer to one of the Santa Monica bus lines at the Pico-Rimpau Transit Center. The average number of weekday passengers is 31,500.

- MTA Line 33/333 - Within the project area Line 33/333 begins in Santa Monica and travels along Ocean Boulevard and Main Street to Venice Boulevard; travels along Venice Boulevard to Main Street in downtown Los Angeles; then continues along Main Street/Spring Street to Sunset Boulevard. Line 333 provides limited-stop service along Venice Boulevard between Motor Street and Figueroa Street in Downtown Los Angeles. Line 33 runs 24 hours daily with headways of generally ten to fifteen minutes during the peak period and twenty minutes during off-peak periods. Line 333 operates weekdays only between 6:00 AM and 6:00 PM. When the Pico/ or Venice/San Vicente Station is complete, this line will continue to drop off and pick up passengers on Venice Boulevard. The average number of weekday passengers is 22,000.

- MTA Line 212 - Within the project area Line 212 travels along La Brea Avenue from Inglewood until it reaches Hollywood Boulevard. It then travels east along Hollywood Boulevard to Gower Street. Hours of operation are from 4:45 AM to 2:00 AM on weekdays and 5:30 AM to 2:00 AM on weekends. Headways are generally eight to fifteen minutes during peak periods and twenty minutes during off- peak periods. The average number of weekday passengers is 10,000.

- MTA Lines 20/21/22 - Within the project area Lines 20/21/22 travel along Wilshire Boulevard, providing service between downtown Los Angeles and: Santa Monica (Line 20), UCLA (Line 21), and Santa Monica via Century City and Brentwood (Line 22). Lines 20 and 22 operate everyday, and Line 21 operates Monday through Saturday. Line 20 operates 24 hours per day. Line 21 operates from 6:25 AM to 12:15 AM on weekdays and from 6:56 AM to 12:15 AM on Saturdays. Line 22 operates from 5:59 AM to 10:00 PM on weekdays, 6:20 AM to 10:00 PM on Saturdays, and 7:20 AM to 9:00 PM on Sundays. Headways are generally seven to fifteen minutes during peak periods and from twenty to thirty minutes during off peak periods. The average number of weekday passengers is 37,800.



(Source: Kimley-Horn & Associates, Inc., 1997)

ULTRASYSTEMS
ENVIRONMENTAL
INCORPORATED

FIGURE 7-1
EXISTING TRANSIT SERVICE

- MTA Lines 320/322 - Within the project area Lines 320/322 travel along Wilshire Boulevard, providing service between the Wilshire/Western Red Line Station and downtown Santa Monica. Line 320 operates Monday through Friday, and Line 322 operates during the morning and evening peak hours Monday through Friday. Line 320 operates from 6:10 AM to 7:30 PM. Line 322 operates from 4:00 PM to 6:40 PM eastbound, and from 6:30 AM to 9:00 AM westbound. Headways are generally seven to fifteen minutes during peak periods and from twenty to thirty minutes during off peak periods.

- MTA Line 209 - Within the project area Line 209 travels along Arlington Avenue, Wilton lace, and Wilshire Boulevard, providing service between the Wilshire/Western Red Line Station and the Vermont/I-105 Green Line Station in Inglewood. Line 209 operates Monday through Saturday. It operates from 5:30 AM to 8:50 PM Monday through Friday, and from 6:00 AM to 8:50 PM on Saturdays. Headways are generally thirty-five minutes. The average number of weekday passengers is 1,500.

- MTA Lines 27/28/328 - Within the project area Line 27/28/328 travels along Olympic Boulevard, providing service between Century City and downtown Los Angeles. Hours of operation are from 4:30 AM to 2:00 AM on weekdays and Saturdays, and 5:00 AM to 2:00 AM on Sundays. Headways are generally seven to fifteen minutes during peak periods and from twenty to thirty minutes during off peak periods. Line 328 provides limited-stop service during the peak hours only. The average number of weekday passengers is 34,000.

- MTA Line 210/310 - Within the project area Line 210/310 starts at the South Bay Galleria Transit Center in the City of Torrance. It travels north along Crenshaw Boulevard through the cities of Hawthorne, Inglewood and the Mid-City to Wilshire Boulevard. It then travels west along Wilshire Boulevard to northbound Rossmore Avenue/Vine Street in Hollywood. It then continues west along Hollywood Boulevard to Highland Avenue. Lines 210/310 operates from 4:30 AM till 2:00 AM with headways generally ten to twenty minutes during peak periods and thirty minutes to one hour during off peak periods. Line 310 does not operate on weekends. The average number of weekday passengers is 19,800.

- MTA Line 434 - Line 434 currently provides service between downtown Los Angeles and the Malibu area, with service along Pacific Coast Highway, the I-10 Freeway, and it stops at the West Los Angeles Transit Center. Via a connection to Line 439, it provides service to the Patsaouras Transit Plaza at Union Station. Weekday service is provided from 5:30 AM to 9:50 PM, with 10-minute headways during the morning peak-hour, and 30- to 60-minute off-peak. Weekend service runs from 6:00 AM to 8:30 PM, with 20-minute headways throughout most of the day. The average number of weekday passengers is 2,261.

- MTA Line 439 - Line 439 currently provides service between downtown Los Angeles and the Redondo Beach area, with service along Catalina Street, Highland Avenue, Sepulveda Boulevard, La Cienega Boulevard and the I-10 Freeway. It also stops at the West Los Angeles Transit Center, the LAX City Bus Center, and the Patsaouras Transit Plaza at Union Station. Weekday service is provided from 5:00 AM to Midnight, with roughly 40-minute headways throughout the day. Weekend service runs from 5:50 AM to 10:30 PM, with one-hour headways throughout the day. The average number of weekday passengers is 2,100.

- MTA Line 68 - Line 68 currently provides service between the West Los Angeles Transit Center and the Town Center Mall in Montebello, with service along Washington Boulevard, Broadway, Ceasar Chavez Avenue, Riggin Street, Garfield Avenue, Via Campo, the I-10 Freeway, Town Center Drive, Montebello Boulevard, and Pomona Boulevard. Weekday service is provided from 4:39 AM to 1:30 PM, with roughly 40-minute headways throughout the day. Weekend service runs from 5:50 AM to 10:30 PM, with 10 to 30 minute headways throughout the day. The average number of weekday passengers is 18,300.

- MTA Lines 207/357 - Lines 207/357 currently provides service between the Western Avenue/Franklin Avenue in Hollywood and the Imperial/Wilmington Metro Blue Line Station, with service along Western Avenue and 120th Street. Service is also provided to the Harbor Freeway/I-105 Metro Green Line Station. Weekday service is provided 24-hours a day by Line 207. Line 357 provides limited weekday service and stops between 5:37 AM and 7:26 PM. Headways average roughly 10 to 30 minutes throughout the day. Line 207 weekend service is provided 24-hours a day, with 10 to 30 minute headways throughout the day. The average number of weekday passengers is 31,200.

- MTA Lines 66/67 - Lines 66/67 currently provides service between the Wilton Place/5th Street in West Los Angeles and Olympic Boulevard/Garfield Avenue in Montebello, with service along Wilton Place, 8th Street, and Olympic Boulevard. Weekday service is provided by Line 66 between 4:33 AM and 1:11 AM. Line 67 provides limited weekday service and stops between 5:26 AM and 6:34 PM. Headways average roughly 15 minutes throughout the day. Line 66 weekend service is provided between 5:00 AM and 1:11 AM, with 10 to 30 minute headways throughout the day. The average number of weekday passengers is 24,000.

- MTA Line 18 - Lines 18 currently provides service between the Wilton Place/5th Street in West Los Angeles and Whittier Boulevard/Garfield Avenue in Montebello, with service along Wilton Place, 6th Street, and Whittier Boulevard. Weekday service is provided by Line 18 between 4:52 AM and 12:37 AM. Headways average roughly 10 to 20 minutes throughout the day. Line 18 provides limited weekday and weekend service between 1:07 AM and 4:29 AM. Headways are every 60 minutes. The average number of weekday passengers is 25,000.

Los Angeles Department of Transportation Bus Lines

- LADOT Midtown DASH - Within the project area the Midtown DASH travels along San Vicente and Pico Boulevards within the project area. Hours of operation are from 7:00 AM to 5:30 AM on weekdays and 9:00 AM to 5:30 PM Saturdays. Headways are thirty minutes throughout the day.

Santa Monica Municipal Bus Lines

- SMMBL Line 5 - Within the project area Santa Monica Line 5 begins at the Veteran's Administration Hospital in West Los Angeles. It runs from the hospital to Olympic Boulevard; continues along Olympic Boulevard to Century City; then travels along Pico Boulevard to the Pico-Rimpau Transit Center. Hours of operations are from 5:45 AM to 8:10 PM on weekdays and generally 7:00 AM to 8:00 PM on weekends and holidays. Headways are generally 20 minutes on weekdays and thirty to forty minutes on weekends. During 1994 the average number of weekday passengers was 2,581.

- SMMBL Line 7 - Within the project area Santa Monica Line 7 begins in Santa Monica at Santa Monica Place Mall at Fourth and Broadway. It runs along Broadway to Ocean Avenue to Pico Boulevard to the Pico-Rimpau Transit Center. Hours of operation are from 4:45 AM to 12:15 AM on weekdays and weekends. Headways are generally ten minutes on weekdays fifteen minutes on Saturdays, and twenty minutes on Sundays. During 1994 the average number of weekday passengers was 15,030.

- SMMBL Line 12 - Within the project area Santa Monica Line 12 begins at UCLA in Westwood and runs through the Palms area of Los Angeles and through Culver City along Palms Avenue and Venice Boulevard. It then travels north on Robertson Boulevard to Pico Boulevard, where it continues on Pico Boulevard to the Pico-Rimpau Transit Center. Hours of operation are from 6:15 AM to 7:05 PM on weekdays and 8:05 AM to 6:05 PM on Saturdays. Line 12 does not run on Sundays. Headways are generally thirty minutes on weekdays, and one hour on Saturdays. During 1994 the average number of weekday passengers was 5,151.

- SMMBL Line 13 - Within the project area Line 13 begins at Pico Boulevard and Westwood at the Westside Pavilion. It runs east along Pico Boulevard to Overland Avenue through Rancho Park via Ashby Avenue, Manning Avenue and Motor Avenue. It then continues east along Pico Boulevard to Beverly Drive to Airdome Avenue to Robertson Boulevard and back to Pico Boulevard until it reaches the Pico-Rimpau Transit Center. Hours of operations are from 6:16 to 9:11 AM and 2:40 to 5:36 PM on weekdays and from 6:52 to 8:46 AM and 3:25 to 5:40 PM on Saturdays. Headways are generally thirty-five minutes on weekdays, one hour on Saturdays. Line 13 does not run on Sundays or major holidays. During 1994 the average number of weekday passengers was 466.

Existing Pedestrian Circulation

Major pedestrian paths in the area are sidewalks along Wilshire, Crenshaw, Olympic, Venice and Pico Boulevards. Sidewalks are also located along Wilton Place and Arlington Avenue, as well as along virtually all other streets throughout the project area. While many of the existing sidewalks are not up to modern City standards, no inconvenience or other issues are currently experienced. Students that live south of Venice Boulevard that are walking to Los Angeles High School currently cut across the Pico/Venice/San Vicente site.

7.1.2 Project Impacts

Thresholds of Significance Criteria

Public Transit

Public transit service would be significantly impacted if project construction or operation resulted in the loss of a bus line, the loss of service on a portion of a route, or a reduction in passengers served.

Pedestrian Circulation

Pedestrian circulation would be significantly impacted if pedestrian routes were eliminated, or made unsafe for the pedestrian or the driver.

7.1.2.1 Construction Impacts

Public Transit

Construction of any of the proposed alternatives would result in some minor disruption in existing transit service. Disruptions during project construction would generally be anticipated along areas undergoing cut-and-cover construction, ~~and~~ during utility relocation activities, and during the removal of the TBM from within Wilshire Boulevard which would occur along:

- Venice Boulevard between Victoria Avenue and San Vicente Boulevard under Alternative B,
- Crenshaw Boulevard between 8th Street and a point 1,100 feet south of Country Club Drive under Alternative C,
- Pico Boulevard (between Victoria Avenue and San Vicente Boulevard under Alternatives A and C,
- ~~Queen Anne Place (between the Queen Anne Recreation Center and Pico Boulevard) under Alternatives A and C, and~~

- Crenshaw Boulevard for 100 feet north and south of Pico Boulevard under Alternative A,
- Crenshaw Boulevard for 100 feet north and south of Venice Boulevard under Alternative B, and
- Wilshire Boulevard between Western Avenue and Manhattan Place~~would also be affected for a short period of time when the tunnel boring machines are removed~~.

Existing bus stops located in cut-and-cover construction areas ~~that~~ would be affected during ~~project cut-and-cover construction~~ installation of the concrete decking. No bus routes would be eliminated, and no existing bus stop closures are anticipated. No loss of ~~or~~ ridership would be expected to occur.

~~Additionally,~~ Construction of the proposed Pico/ or Venice/San Vicente Station, which would occur under of any of the proposed alternatives, would result in the need to temporarily relocate the existing Pico/Rimpau Transit Center. Bus routes affected by this would include MTA Lines 30/31; LADOT Midtown DASH; and Santa Monica Municipal Bus Lines 5, 7, 12, and 13.

Overall, construction-related impacts to existing bus service would not be significant.

Pedestrian Circulation

Disruptions to pedestrian circulation would occur along areas undergoing cut-and-cover construction,~~and~~ during utility relocation activities, and during the removal of the TBM from within Wilshire Boulevard which would occur along:

- Venice Boulevard (between Victoria Avenue and San Vicente Boulevard) under Alternative B,
- Crenshaw Boulevard (between 8th Street and a point 1,100 feet south of Country Club Drive) under Alternative C,
- Pico Boulevard (between Victoria Avenue and West Boulevard) under Alternatives A and C, and
- Wilshire Boulevard (between Western Avenue and Manhattan Place)~~would also be affected for a short period of time if and when the tunnel boring machines are removed~~.

Students that live south of Venice Boulevard and who walk to Los Angeles High School currently cut across the Pico/Venice/San Vicente site. During construction these students would be required to walk around the construction site. Elementary students that walk to Wilton Place School ~~and Pio Pico School~~ would not be effected by construction of the Olympic/Arlington Station because ~~Olympic Boulevard is the dividing line between the two schools. As such, students walking to these two schools~~ they would be walking away from the construction site for the Olympic/Arlington Station~~because it is located on the boundary line between the two schools~~. Students that walk to Pio Pico School that live north of Olympic Boulevard would potentially have to pass the Olympic/Arlington Station construction site.

7.1.2.2 Operation and Maintenance Impacts

Public Transit

The potential impacts that the proposed project could have on the public transit system were ~~was~~ determined by assessing the potential need to eliminate or reduce MTA bus service. It was concluded that there would be no significant impacts on the transit system resulting from the implementation of the proposed Metro Red Line Mid-City Segment project. ~~This is due to the fact that,~~ With minor revisions, ~~all~~ existing Mid-City transit lines would be maintained and ~~as is, or re-~~routed to serve the future stations in this segment~~without affecting service to current passengers. This would involve no changes to the current headways, and only minor changes to the areas served~~.

A positive impact of the project is the reduced travel time patrons would benefit from by riding the Red Line rather than a bus to get to downtown Los Angeles, the Blue Line, Union Station, and ~~or other~~ destinations along Wilshire Boulevard. The extension of the Red Line would create opportunities to use the bus fleet more effectively.

~~Los Angeles County Metropolitan Transportation Authority (MTA)~~ Bus Lines

When the Pico/ or Venice/San Vicente Station is complete the following bus lines ~~MTA Lines 30/31, 33/333, and 212~~ would use the bus transfer facility within the station for drop-offs, pick-ups, and layovers:

- MTA Lines 30/31, 33/333, and 212
- Midtown DASH Lines 27, 28, and 328, and
- Santa Monica Municipal Bus Lines 5, 7, 12, and 13

It is also proposed that MTA Lines 434 and 439 be extended to include stops at the bus transfer facility within the station.

~~Los Angeles Department of Transportation Bus Lines~~

~~When the Pico/ or Venice/San Vicente Station is complete, the Midtown DASH Lines 27, 28, and 328 would divert off Pico Boulevard into the station and would use the bus transfer facility for drop-offs, pick-ups, and layovers.~~

~~Santa Monica Municipal Bus Lines~~

~~When the Pico/ or Venice/San Vicente Station is complete, Santa Monica Lines 5, 7, 12, and 13 would use the bus transfer facility within the station for drop-offs, pick-ups, and layovers.~~

Pedestrian Circulation

Since all the proposed "build" alternatives would be underground except for the Venice/San Vicente Station (Alternatives B1 and B2), there would be little to no impact on existing pedestrian circulation throughout the project area. For the Red Line patrons who would walk to the station, ~~(new pedestrians in the area)~~ all of the proposed new stations would be designed to accommodate pedestrian access among various components of the facility. Overall, operation of the proposed project would not result in any significant impacts to pedestrian circulation.

Students that live south of Venice Boulevard and who walk to Los Angeles High School currently cut across the Pico/Venice/San Vicente site. During operation of the transit project these students may walk around the transit station or they may utilize the pedestrian bridge (Alternative B) that would span from Venice Boulevard to the parking structure. A potential impact of the proposed project would be students or other pedestrians crossing over the tail tracks (Alternative B1) or crossing the bus paths at the terminus station.

7.1.3 Cumulative Impacts

7.1.3.1 Construction Impacts

Public Transit

Construction activities associated with planned future transit connections to the Pico/ or Venice/San Vicente site (Future Red Line Western Extension and the Crenshaw/Prairie Line) could result in impacts to transit operations similar to those mentioned above for the proposed project. These impacts would occur subsequent to the construction/operation impacts described above, and would be the responsibility of future projects to mitigate any potential impacts identified.

Pedestrian Circulation

Construction of the proposed Crenshaw-Prairie Line is anticipated to require additional space ~~amounts of right-of-way~~ which could result in encroachments into the existing sidewalk area along the south side of Venice Boulevard (between Virginia Road and San Vicente Boulevard). This impact would be short-term and would not be a significant effect to pedestrian safety or movability.

7.1.3.2 Operation and Maintenance Impacts

Public Transit

The construction and subsequent operation of any of the proposed project alternatives would not result in significant impacts on public transit, and would result in overall cumulative benefits to public transit systems throughout the proposed project area and the City of Los Angeles. Providing an alternative travel mode would reduce dependency on passenger vehicles, thereby improving travel times on roadways throughout the project area. The extension of the Red Line would create opportunities to use the bus fleet more effectively.

Pedestrian Circulation

All stations associated with this project would incorporate pedestrian circulation systems that would be significantly better than what currently exists. For example, individuals currently crossing the Pico/San Vicente site cut through existing parking lots and traverse a dirt path worn into the slope on the south side of the property. Design of the station areas would incorporate pedestrian friendly passage ways. As such, the design, construction and future operation of any of the proposed project alternatives would not result in significant changes to existing pedestrian routes or increased risk to the pedestrian circulation systems throughout the proposed project area.

7.1.4 Mitigation Measures

Public Transit (All Alternatives)

Construction

1. The MTA will maintain access to bus stops wherever possible during the construction period. Where required, bus stops will be relocated to areas within reasonable walking distance from the current site, and/or to achieve the most direct pedestrian access to the site.

2. MTA will provide a temporary transit transfer facility within the vicinity of the Pico/ or Venice/San Vicente Station site if the existing Pico/Rimpau Transit Center has to be closed during construction.

3. MTA Line 212 and the Midtown Dash Line will be modified slightly to include pick-ups and drop-offs within the transit transfer facility in the Pico/ or Venice/San Vicente Station.

Construction and Operation

4. The MTA will coordinate with all public transit agencies serving the project area to ensure that transit users receive advanced notification of any necessary alterations in bus routes or in bus stop locations.

Pedestrian Circulation (All Alternatives)

Construction

5. To ensure that sidewalk closures due to construction do not impact pedestrian safety (i.e. encouragement of jay-walking), the MTA will require their contractors to maintain safe pedestrian access through and/or around active construction areas, through application of standard MTA construction area pedestrian safety measures (identified below in #7).

6. To ensure students or any other pedestrians don't try to cross over the tail tracks (Alternative B1), or cross the bus paths (Alternatives A, B, and C), the MTA will require the station designers to secure the tail track area, and to provide a direct pedestrian route that will separate pedestrians from buses and passenger vehicles.

7. The MTA will implement standard construction area pedestrian safety measures (such as building temporary sidewalks, or directing pedestrians to alternative paths) to ensure that safe pedestrian access through and/or around active construction areas is maintained.

8. In station areas, MTA will reconstruct sidewalks and add appropriate landscaping to improve the appearance of the area.

9. MTA will provide crossing-guards for the students that have to pass the Olympic/Arlington Station construction site.

7.1.5 Unavoidable Significant Adverse Impacts

Implementation of the above-mentioned mitigation measures would reduce or eliminate any transit or pedestrian impacts of the proposed project to a less than significant level.

7.2 TRAFFIC

Introduction

This section of the SEIS/SEIR documents the assumptions, methodologies, and findings of a study conducted by Kimley-Horn and Associates, Inc. to evaluate the potential traffic and circulation impacts of the proposed Metro Red Line Mid-City Segment project. The Traffic Impact Analysis is provided in Appendix F of this document.

The scope for this study was developed in conjunction with the City of Los Angeles Department of Transportation (LADOT) and the MTA. The base assumptions, technical methodologies, and geographic coverage of this study were identified as part of the study approach, which was outlined in a Memorandum of Understanding (MOU) between Kimley-Horn and Associates, Inc. and LADOT.

This study is conducted to evaluate the traffic-related impacts associated with project-generated traffic associated with each of the proposed Mid-City stations. The following scenarios are analyzed in the study:

- ***Existing Conditions*** - The analysis of existing traffic conditions will provide the basis for the future conditions analysis sections of the study. The existing conditions analysis includes a presentation and assessment of existing streets and highways, intersection configurations, traffic volumes, peak hour operating conditions, and transit service.

- ***Cumulative Base (Year 2020) Conditions*** - The Cumulative Base (Year 2020) Conditions analysis will evaluate the projected operating conditions with the levels of traffic resulting from regional growth and related projects in the vicinity of the project sites. The Cumulative Base Condition does not assume the proposed Metro Red Line Mid-City Segment to be in place. The Cumulative Base (Year 2020) Condition is the No Project Alternative.

- ***Cumulative (Year 2020) Plus Project Conditions*** - The Cumulative (Year 2020) Plus Project Conditions analysis will evaluate the projected operating conditions in Year 2020, assuming the Metro Red Line Mid-City Segment to be in place. This analysis scenario will evaluate the impact of the project-related traffic on the surrounding roadway system.

7.2.1 Environmental Setting

The assessment of existing traffic conditions relevant to this study includes an inventory of the street system in the vicinity of the project, the existing traffic volumes currently using these facilities, the operating conditions at the key intersections within the project area, and the existing transit service provided in the area.

Existing Street System

Regional access to the project area is primarily provided by the Santa Monica Freeway (I-10). The Santa Monica Freeway runs in an east-west direction, approximately one mile south of the project area. The major streets serving the project area include La Brea Avenue, Crenshaw Boulevard, Arlington Avenue/Wilton Place, and Western Avenue in the north-south direction, and Wilshire, Olympic, Pico and Venice Boulevards in the east-west direction. San Vicente Boulevard cuts through the western portion of the project area in a northwest to southeast orientation.

Physical characteristics of the major streets serving the study area, including number of lanes, median type, and on-street parking restrictions, are presented in Table 7-1. Diagrams of the existing lane configurations at these analyzed intersections are contained in Appendix A of the Traffic Impact Analysis provided in Appendix F of this document.

Through discussions with LADOT staff, it was determined that 20 of the 27 study intersections are currently included in the City's Automated Traffic Surveillance and Control (ATSAC) system. The ATSAC System represents the current state-of-the-art in computer control of traffic signals. Some of the distinguishing features of the system include automatic adjustment of signal timing plans to reflect changing traffic conditions, identification of unusual traffic conditions caused by incidents, the ability to implement special purpose short-term signal timing changes in response to incidents, and the ability to quickly identify signal equipment malfunctions.

Six of the study intersections are currently undergoing modification and will be added to the proposed Mid-Wilshire ATSAC. The intersection of Pico Boulevard and Muirfield Road is currently unsignalized with stop controls at both approaches along Muirfield Road.

Existing Traffic Volumes and Levels of Service

The following sections present the existing intersection peak hour traffic volumes, a description of the methodology utilized to analyze intersection operating conditions, and a summary of peak hour level of service at each of the intersections for existing conditions.

Existing Traffic Volumes

Existing traffic count data was obtained from the prior traffic impact analysis conducted in 1995 for this project for twenty-two of the study intersections. Morning and evening (AM and PM) peak period traffic counts were conducted in January of 1997 as part of this study at the remaining five study intersections. Existing AM and PM peak hour traffic volumes at the analyzed intersections are shown on Figure 7-2.

Level of Service Methodology

Level of service (LOS) is a qualitative measure used to describe the condition of traffic flow, ranging from Level of Service A, which represents excellent, uncongested conditions; to Level of Service F, which indicates congested, over-capacity conditions. LOS D is typically recognized as the satisfactory service level for intersections in urban areas.

The "Critical Movement Analysis-Planning" (Transportation Research Board, 1980) method of intersection capacity analysis was used to determine the intersection volume-to-capacity (V/C) ratio and corresponding LOS for existing operating conditions at the signalized intersections. Provided on Table 7-2 is a description of each V/C ratio and the corresponding LOS. In accordance with LADOT procedures, capacity values were increased by seven percent at intersections included in the ATSAC system to reflect ATSAC's estimated benefit to the transportation system.

The one unsignalized intersection, Muirfield Road and Pico Boulevard, is currently controlled by stop signs on the Muirfield approaches. Therefore, the "Two-Way Stop Control" method (Transportation Research Board, 1994) was employed to determine the average delay and corresponding LOS for the stop-controlled movements. Using this methodology, the average delay for each of the turning movements is measured and translated into a level of service for each movement. The average total delay for each approach and the intersection as a whole is also calculated. The intersection LOS is determined by selecting the worst case from among the various

Table 7-1
Existing Surface Street Physical Characteristics

Primary Street	Start of Segment	End of Segment	# of Lanes		Median Type	Stopping & Parking Prohibition	
			NB	SB		Northbound	Southbound
La Brea Avenue	6th Street	Wilshire Boulevard	3/2	3/2	2 LT	NS 7-9am, 4-7pm; 2hr 9-4/M	NS 7-9am, 4-7pm; 2hr 9-4
	Wilshire Boulevard	8th Street	3/2	3/2	2 LT	NS 7-9am, 4-7pm; 2hr 9-4/M	NS 7-9am, 4-7pm; 2hr 9-4/M
	8th Street	9th Street	3/2	3/2	2 LT	NS 7-9am, 4-7pm; 1hr 9-4/M	NS 7-9am, 4-7pm; 2hr 9-4/M
	9th Street	12th Street	3/2	3/2	2 LT	NS 7-9am, 4-7pm; 1hr 9-4/M	NS 7-9am, 4-7pm; 1hr 9-4
	12th Street	Dockweiler Street	3/2	3/2	2 LT	NS 7-9am, 4-7pm; 1hr 9-4/M	NS 7-9am, 4-7pm; 1hr 9-4
	Dockweiler Street	San Vicente Boulevard	3/2	3	2 LT	NS 7-9am, 4-7pm; 1hr 9-4/M	NSAT
	San Vicente Boulevard	Street Elmo Drive	3/2	3/2	2 LT	NS 7-9am, 4-7pm; 1hr 9-4/M	NS 7-9am, 4-7pm; 1hr 9-4
Rimpau Boulevard	6th Street	Wilshire Boulevard	1	1	Dashed	NP 8-6	NP 8-6
	Wilshire Boulevard	8th Street	1	1	Dashed	2hr 8-6	2hr 8-6
	8th Street	Olympic Boulevard	1	1	Dashed	PA	PA
	Olympic Boulevard	Edgewood Place	1	1	Dashed	NS 7-5 School Days	PA
	Edgewood Place	Pico Boulevard	1	1	Dashed	PA	PA
Mullen Avenue	Edgewood Place	Pico Boulevard	1	1	None	PA	PA
Muirfield Road	Edgewood Place	Pico Boulevard	1	1	None	PA	PA
West Boulevard	Edgewood Place	Pico Boulevard	1	1	None	NP 8-6	PA
Bronson Avenue	Country Club Drive	Country Club Drive	1	1	Dashed	PA	PA

Notes: (1) LANES: # = Number of lanes; #/# = Peak/Off-Peak number of lanes
(2) MEDIAN TYPES: DY - Double yellow centerline; 2 LT = Two-Way left-turn lane, Raised = Raised concrete median, Dashed = no median
(3) PARKING: /M = Metered parking; PA = Parking allowed; NPAT = No parking any time; NSAT = No stopping any time; NS = No stopping, 2hr, 8-4 = Parking allowed, TANS = Tow away, no stopping
(4) EB = Eastbound; WB = Westbound; NB = Northbound; SB = Southbound

Table 7-1 (Continued)
Existing Surface Street Physical Characteristics

Primary Street	Start of Segment	End of Segment	# of Lanes		Median Type	Stopping & Parking Prohibition	
			NB	SB		Northbound	Southbound
Crenshaw Boulevard	Wilshire Boulevard	9th Street	2	2	DY	PA	PA
	9th Street	Olympic Boulevard	2	2	DY	1-hr 8-6	1-hr 8-6
	Olympic Boulevard	Country Club Drive	2	2	DY	1-hr 8-6	PA
	Country Club Drive	Pico Boulevard	2	2	DY	PA	PA
	Pico Boulevard	St. Charles Place	2	2	DY	NS 7-9 am, 4-6 pm	NS 7-9 am, 4-6 pm
4th Avenue	9th Street	Country Club Drive	1	1	None	2hr 8-6	2hr 8-6
Wilton Place	6th Street	Wilshire Boulevard	2/1	2	DY	NS 7-9am, 4-7pm	NS 7-9am, 4-7pm
	Wilshire Boulevard	Ingraham Street 7th Street	2	2/1	DY	NS 7-9am, 4-7pm; 2hr 9-4/M	NS 7-9am, 4-7pm; 2hr 9-4/M
	Ingraham Street	7th Street	2	2/1	DY	NS 7-9am, 4-7pm	NS 7-9am, 4-7pm
	7th Street	Leeward Avenue	2/1	2/1	DY	NS 7-9am, 4-7pm	NS 7-9am, 4-7pm
	Leeward Avenue	8th Street	2/1	2	DY	NS 7-9am, 4-7pm	NS 7-9am, 4-7pm; NP 9-4 School Days
	8th Street	San Marino Street	2/1	2/1	DY	NS 7-9am, 4-7pm	NS 7-9am, 4-7pm
	San Marino Street	Olympic Boulevard	2	2	DY	PA	NS 7-9am, 4-7pm
Arlington Avenue	Olympic Boulevard	Country Club Drive	2	2	2LT	PA	1hr 8-6
	Country Club Drive	15th Street	2/1	2/1	DY	NS 7-9am, 4-7pm	NS 7-9am, 4-7pm
Western Avenue	14th Street	Pico Boulevard	2	2	DY	NSAT Red Curb	NSAT Red Curb
	Pico Boulevard	12th Street	2	2	DY	1HR 8A-6P/M	1HR 8A-6P/M
	12th Street	Country Club Drive	2	2	DY	1HR 8A-6P/M	Red Curb
	Country Club Drive	Harrington	2	2	DY	1HR 8A-6P/M	1HR 8A-6P/M

Notes: (1) LANES: # = Number of lanes; #/# = Peak/Off-Peak number of lanes
(2) MEDIAN TYPES: DY - Double yellow centerline; 2 LT = Two-Way left-turn lane, Raised = Raised concrete median, Dashed = no median
(3) PARKING: /M = Metered parking; PA = Parking allowed; NPAT = No parking any time; NSAT = No stopping any time; NS = No stopping, 2hr, 8-4 = Parking allowed, TANS = Tow away, no stopping
(4) EB = Eastbound; WB = Westbound; NB = Northbound; SB = Southbound

Table 7-1 (Continued)
Existing Surface Street Physical Characteristics

Primary Street	Start of Segment	End of Segment	# of Lanes		Median Type	Stopping & Parking Prohibition	
			NB	SB		Northbound	Southbound
Western Avenue, (Cont.)	Harrington	11th Street	2	2	DY	1HR 8A-6P/M	1HR 8A-6P/M
	11th Street	Connecticut	2	2	DY	1HR 8A-6P/M	1HR 8A-6P/M
	Connecticut	Olympic	2	2	DY	1HR 8A-6P/M	Red Curb
	Olympic	Monette Place	2	2	DY	1HR 8A-6P/M	1HR 8A-6P/M
	Monette Place	San Marino	2	2	DY	1HR 8A-6P/M	1HR 8A-6P/M
	San Marino	9th Street	2	2	2LT	NSAT	1HR 8A-6P/M
	9th Street	8th Street	2	2	2LT	1HR 8A-6P/M	NSAT
	8th Street	7th Street	2	2	2LT	Red Curb	1HR 8A-6P/M
	7th Street	Ingraham	2	2	DY	NSAT Red Curb	1HR 8A-6P/M
	Ingraham	Wilshire	2	2	DY	Red Curb	NSAT
	Wilshire	6th Street	2	2	DY	1HR 8A-6P/M	Red Curb
Wilshire Boulevard	Detroit	La Brea	3	3	Raised	TANS 7-9A,4-7P;NPAT	Red Curb
	La Brea	Sycamore	3	3	Raised	TANS 7-9A,4-7P;NPAT	TANS 7-9A,4-7P;NPAT
	Sycamore	Orange	3/2	3/2	DY	TANS 7-9A,4-7P,1HR 9A-7P	TANS 7-9A,4-7P,1HR 9A-7P
	Orange	Mansfield	3	3	DY	TANS 7-9A,4-7P;NPAT	TANS 7-9A,4-7P;NPAT
	Mansfield	Citrus	3/2	3	DY	TANS 7-9A,4-7P,1HR 9A-7P	TANS 7-9A,4-7P;NPAT
	Citrus	Highland	3	3	DY	TANS 7-9A,4-7P;NPAT	NSAT, Red Curb
	Highland	McCadden	3	3	DY	TANS 7-9A,4-7P;NPAT	TANSAT
	McCadden	Longwood	3	3	DY	TANS 7-9A,4-7P;NPAT	TANSAT

Notes: (1) LANES: # = Number of lanes; #/# = Peak/Off-Peak number of lanes
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(3) PARKING: /M = Metered parking; PA = Parking allowed; NPAT = No parking any time; NSAT = No stopping any time; NS = No stopping, 2hr, 8-4 = Parking allowed, TANS = Tow away, no stopping
(4) EB = Eastbound; WB = Westbound; NB = Northbound; SB = Southbound

Table 7-1 (Continued)
Existing Surface Street Physical Characteristics

Primary Street	Start of Segment	End of Segment	# of Lanes		Median Type	Stopping & Parking Prohibition	
			NB	SB		Northbound	Southbound
Wilshire Boulevard (Cont.)	Longwood	Tremaine	3	3	DY	TANS 7-9A,4-7P;NPAT	TANS 7-9A,4-7P;NPAT
	Tremaine	Keniston/June	3	3	DY	Red Curb	TANS 7-9A,4-7P;NPAT
	Keniston/June	Hudson	3	3	DY	TANS 7-9A,4-7P;NPAT	TANS 7-9A,4-7P;NPAT
	Hudson	Rimpau	3	3	DY	TANS 7-9A,4-7P;NPAT	TANS 7-9A,4-7P;NPAT
	Rimpau	Mullen	3	3	DY	TANS 7-9A,4-7P;NPAT	TANS 7-9A,4-7P;NPAT
	Mullen	Muirfield	3	3	DY	TANS 7-9A,4-7P;NPAT	TANS 7-9A,4-7P;NPAT
	Muirfield	Fremont Place	3	3	DY	TANS 7-9A,4-7P;NPAT	TANS 7-9A,4-7P;NPAT
	Fremont Place	Arden	3	3	DY	TANS 7-9A,4-7P;NPAT	TANS 7-9A,4-7P;NPAT
	Arden	Lucerne	3	3	2LT	TANS 7-9A,4-7P;NPAT	TANS 7-9A,4-7P;NPAT
	Lucerne	Plymouth	3	3	DY	TANS 7-9A,4-7P;NPAT	TANS 7-9A,4-7P;NPAT
	Plymouth	Windsor	3	3	DY	TANS 7-9A,4-7P;NPAT	TANS 7-9A,4-7P;NPAT
	Windsor	Lorraine	3	3	DY	TANS 7-9A,4-7; NPAT	TANS 7-9A,4-7P;NPAT
	Lorraine	Crenshaw	3	3	2LT	Red Curb	Red Curb
	Crenshaw	Bronson	3	3	DY	TANS 7-9A,4-7P;NPAT	TANS 7-9A,4-7P;NPAT
	Bronson	Norton	3/2	3/2	DY	TANS 7-9A,4-7P;1hr 9A-4P/M	TANS 7-9A,4-7P;1hr 9A-4P/M
	Norton	Van Ness	3/2	3/2	DY	TANS 7-9A,4-7P;1hr 9A-4P/M	TANS 7-9A,4-7P;1hr 9A-4P/M
	Van Ness	Wilton	3	3/2	DY	Red Curb	TANS 7-9A,4-7P;1hr 9A-4P/M
	Wilton	Gramercy	3/2	3	DY	TANS 7-9A,4-7P;1hr 9A-4P/M	Red Curb
	Gramercy	St Andrews	3/2	3/2	DY	TANS 7-9A,4-7P;1hr 9A-4P/M	TANS 7-9A,4-7P;1hr 9A-4P/M

Notes: (1) LANES: # = Number of lanes; #/# = Peak/Off-Peak number of lanes
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(4) EB = Eastbound; WB = Westbound; NB = Northbound; SB = Southbound

Table 7-1 (Continued)
Existing Surface Street Physical Characteristics

Primary Street	Start of Segment	End of Segment	# of Lanes		Median Type	Stopping & Parking Prohibition	
			NB	SB		Northbound	Southbound
Wilshire Boulevard (Cont.)	St Andrews	Manhattan Pl	3/2	3	DY	TANS 7-9A,4-7P;1hr 9A-4P/M	Red Curb
	Manhattan Pl	Western	3/2	3/2	DY	TANS 7-9A,4-7P;1hr 9A-4P/M	TANS 7-9A,4-7P;1hr 9A-4P/M
	Western	Oxford	3/2	3/2	DY	TANS 7-9A,4-7P;1hr 9A-4P/M	TANS 7-9A,4-7P;1hr 9A-4P/M
8th Street	Plymouth Boulevard	Windsor Boulevard	1	1	Dashed	NPAT	NPAT
	Windsor Boulevard	Lorraine Boulevard	2	1	DY	PA	PA
	Lorraine Boulevard	3rd Street	2	2	DY	PA	PA
	3rd Street	Wilton Place	2	2	DY	PA	NS 7-5 School Days
Olympic Boulevard	Detroit Street	La Brea Avenue	3	3/2	DY	NSAT	NS 7-9am, 3-7pm; 1hr 9-3
	La Brea Avenue	Sycamore Avenue	3/2	3/2	2 LT	NS 7-10am, 3-7pm; 1hr 10-3	NS 7-9am, 3-7pm; 1hr 9-3
	Sycamore Avenue	Mansfield Avenue	3/2	3	2 LT	NS 7-10am, 3-7pm; 1hr 10-3	NS 7-9am, 3-7pm; NP 9-3
	Mansfield Avenue	Rimpau Blvd	3/2	3/2	2 LT	NS 7-10am, 3-7pm	NS 7-9am, 3-7pm
	Rimpau Blvd	Mullen Avenue	3/2	3/2	DY	NS 7-10am, 3-7pm	NS 7-9am, 3-7pm
	Mullen Avenue	Muirfield Road	3/2	3/2	DY	NS 7-10am, 3-7pm	NS 7-9am, 3-7pm; 1hr 9-3
	Muirfield Road	Le Claire Place	3/2	3/2	2 LT	NS 7-10am, 3-7pm	NS 7-9am, 3-7pm
	Le Claire Place	Victoria Avenue	3/2	3/2	2 LT	NS 7-10am, 3-7pm	NS 7-9am, 3-7pm
	Victoria Avenue	Crenshaw Boulevard	3/2	3/2	DY	Red curb	Red curb
	Crenshaw Boulevard	5th Avenue	3/2	3/2	DY	NS 7-10am, 3-7pm; 1hr 10-3	NS 7-9am, 3-7pm; 1hr 9-3
	5th Avenue	4th Avenue	3/2	3	DY	NS 7-10am, 3-7pm; 1hr 10-3	NPAT
	4th Avenue	3rd Avenue	3/2	3/2	DY	NS 7-10am, 3-7pm; 1hr 10-3	NS 7-9am, 3-7pm

Notes:
(1) LANES: # = Number of lanes; #/# = Peak/Off-Peak number of lanes
(2) MEDIAN TYPES: DY - Double yellow centerline; 2 LT = Two-Way left-turn lane, Raised = Raised concrete median, Dashed = no median
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(4) EB = Eastbound; WB = Westbound; NB = Northbound; SB = Southbound

Table 7-1 (Continued)
Existing Surface Street Physical Characteristics

Primary Street	Start of Segment	End of Segment	# of Lanes		Median Type	Stopping & Parking Prohibition	
			NB	SB		Northbound	Southbound
Olympic Boulevard (Cont.)	3rd Avenue	Westchester Place	3	3	DY	NSAT	NSAT
	Westchester Place	Arlington Avenue	3/2	3/2	DY	NS 7-10am, 3-7pm; 1hr 10-3	NS 7-9am, 3-7pm; 1hr 9-3
	Arlington Avenue	Grammercy Place	3/2	3/2	DY	NS 7-10am, 3-7pm; 1hr 10-3	NS 7-9am, 3-7pm; 1hr 9-3
	Grammercy Place	Manhattan Place	3/2	3/2	DY	NS 7-10am, 3-7pm; 1hr 10-3	NS 7-9am, 3-7pm; 1hr 9-3
	Manhattan Place	Western Avenue	3/2	3/2	DY	NS 7-10am, 3-7pm; 1hr 10-3/M	NS 7-9am, 3-7pm; 1hr 9-3/M
Country Club Drive	Olympic Blvd	Plymouth Boulevard	1	2	DY	NS 4-6pm	NPAT
	Plymouth Boulevard	Crenshaw Boulevard	1	1	Dashed	NS 4-6pm	PA
	Crenshaw Boulevard	Bronson Avenue	1	1	Dashed	PA	PA
	Bronson Avenue	4th Street	1	1	Dashed	PA	PA
San Vicente Boulevard	Orange Drive	Tremaine Avenue	3	3	Raised	PA	PA
	Tremaine Avenue	Pico Boulevard	2	3	Raised	PA	PA
	Pico Boulevard	Venice Boulevard	2	2	DY	NPAT	NPAT
Pico Boulevard	Orange Drive	Mansfield Avenue	3/2	3/2	2LT	NS 6A-Noon, 2HR Noon-6P/M	NS 6A-Noon, 2HR Noon-6P/M
	Mansfield Avenue	La Brea Avenue	3	3/2	DY	NS 7-9am; NPAT	NO SIGNS
	La Brea Avenue	Highland Avenue	3	3	DY	NS 7-9am	NS 4-6pm
	Highland Avenue	Longwood Avenue	3	3	DY	NS 7-9am	NS 4-6pm; NPAT
	Longwood Avenue	Tremaine Avenue	3/2	3/2	2LT	NS 7-9am	NS 4-6pm
	Tremaine Avenue	San Vicente Boulevard	2	3	DY	NS 7-9am	NSAT
	San Vicente Boulevard	Hudson Avenue	2	2	DY	NS 7-9am; 2hr 9-6	NS 4-6pm; 2hr 8-4

Notes: (1) LANES: # = Number of lanes; #/# = Peak/Off-Peak number of lanes
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(4) EB = Eastbound; WB = Westbound; NB = Northbound; SB = Southbound

Table 7-1 (Continued)
Existing Surface Street Physical Characteristics

Primary Street	Start of Segment	End of Segment	# of Lanes		Median Type	Stopping & Parking Prohibition	
			NB	SB		Northbound	Southbound
Pico Boulevard (Cont.)	Hudson Avenue	Rimpau Boulevard	2	2	2LT	NS 7-9am; 2hr 9-6	NS 4-6pm; 2hr 8-4/M
	Rimpau Boulevard	Muirfield Road	2	2	DY	NS 7-9am; 2hr 9-6	NS 4-6pm; 2hr 8-4/M
	Muirfield Road	Crenshaw Boulevard	2	2	2LT	NS 7-9am; 2hr 9-6/M	NS 4-6pm; 2hr 8-4/M
	Crenshaw Boulevard	Arlington Avenue	2	2	DY	NS 7-9am, 4-6pm; 2hr 9-6/M	NS 4-6pm; 2hr 8-4/M
	Arlington Avenue	Van Ness Avenue	2	2	DY	NS 7-5 School Days	NS 4-6pm;2hr 8-4/M
	Van Ness Avenue	Street Andrews Place	2	2	DY	NS 7-9am	NS 4-6pm
	St. Andrews Place	Western Avenue	2	2	DY	NS 7-9am; 1hr 9-6	NS 4-6pm
Venice Boulevard	Orange Drive	Highland Avenue	3	3	Raised	NSAT	NSAT
	Highland Avenue	Lafayete Road	4	3	Raised	NSAT	NSAT
	Lafayete Road	Victoria Avenue	3	3	Raised	NSAT	NSAT
	Victoria Avenue	Crenshaw Boulevard	3	3	DY	NSAT	NSAT
	Crenshaw Boulevard	12th Avenue	3/2	3/2	DY	NS 7-9am	NS 4-6pm

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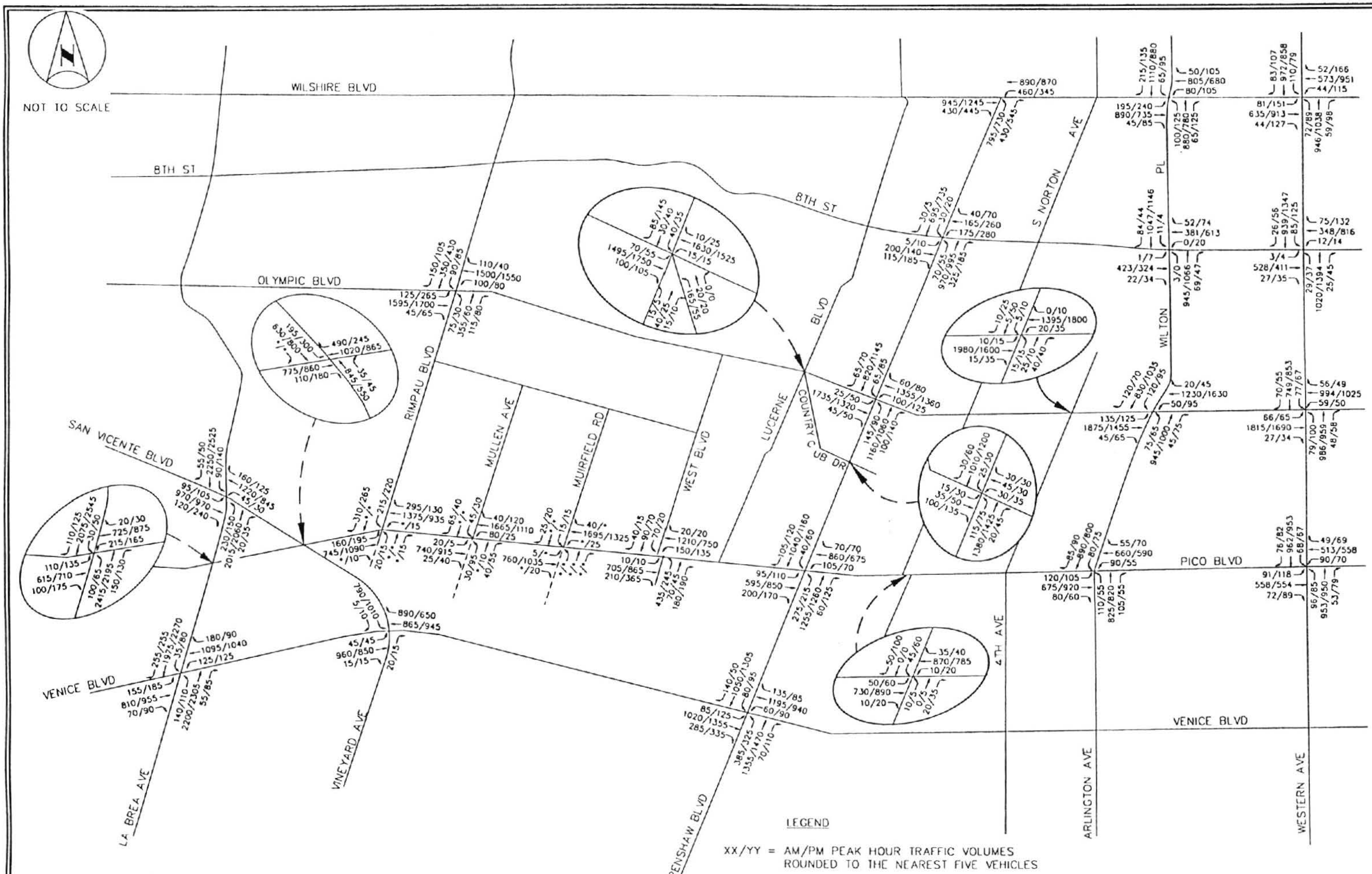

(Source: Kimley-Horn & Associates, Inc., 1997)

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FIGURE 7-2
EXISTING MORNING AND EVENING PEAK HOUR TRAFFIC VOLUMES

Table 7-2
Level of Service Definitions for Signalized Intersections

Level of Service	Volume-to-Capacity Ratio	Definition
A	0.00 - 0.60	EXCELLENT. No vehicle waits longer than one red light, and no approach phase is fully used.
B	0.61 - 0.70	VERY GOOD. An occasional approach phase is fully utilized; many drivers begin to feel somewhat restricted within groups of vehicles.
C	0.71 - 0.80	GOOD. Occasionally, drivers may have to wait through more than one red light; back-ups may develop behind turning vehicles.
D	0.81 - 0.90	FAIR. Delays may be substantial during portions of the rush hours, but enough lower volume periods occur to permit clearing of developing lines, preventing excessive back-ups.
E	0.91 - 1.00	POOR. Represents the maximum number of vehicles intersection approaches can accommodate; may be long lines of waiting vehicles through several signal cycles.
F	> 1.00	FAILURE. Back-ups from nearby locations or on cross streets may restrict or prevent movement of vehicles outside of the intersection approaches. Tremendous delays with continuously increasing queue lengths.

Source: Transportation Research Board, *Transportation Research Circular No. 212, Interim Materials on Highway Capacity,* 1980

constrained movements. Provided on Table 7-3 is a summary of the ranges of delay and their corresponding levels of service for unsignalized intersections. It should be noted that the signalization of the intersection of Muirfield Road and Pico Boulevard is proposed as part of the project description for the development of the Pico/San Vicente and Venice/San Vicente Station alternatives and was, therefore, analyzed as a signalized intersection in the "With Project" scenarios.

Existing Peak Hour Levels of Service

Summarized on Table 7-4 are the existing weekday AM and PM peak hour V/C ratio, delay, and corresponding level of service at the analyzed intersections. As shown in Table 7-4, 18 of the analyzed intersections are currently operating at satisfactory levels of service (i.e., LOS D or better) during both the AM and PM peak hours. The following 9 intersections (shown in bold on Table 7-4) operate at LOS E or F during one or both of the AM and PM peak hours:

- 8th Street & Wilton Place (both peak hours)
- 8th Street & Western Avenue (PM peak hour)
- La Brea Avenue & San Vicente Boulevard (AM peak hour)
- Pico Boulevard & Rimpau Boulevard (AM peak hour)

Table 7-3 Level of Service Definitions for Two-way Stop-controlled Intersections	
Level of Service	Average Vehicle Delay (Seconds)
A	0 to 5
B	> 5 to 10
C	> 10 to 20
D	> 20 to 30
E	> 30 to 45
F	> 45

- Pico Boulevard & Muirfield Road (both peak hours)
- Venice Boulevard & La Brea Avenue (PM peak hour)
- Venice Boulevard & Crenshaw Boulevard (both peak hours)
- Olympic Boulevard & Rimpau Boulevard (PM peak hour)
- Crenshaw Boulevard & Country Club Drive (PM peak hour)

7.2.2 Project Impacts

The potential impacts of the proposed Mid-City Segment on the local street system were evaluated by developing estimates of future traffic conditions in the area both without and with the proposed project traffic. Future traffic projections were developed for the Year 2020 Base Condition (without the project). These future forecasts reflect traffic increases due to general regional growth and traffic that is expected to be generated by other specific developments in the vicinity of the project. These traffic volumes represent the Cumulative Base conditions.

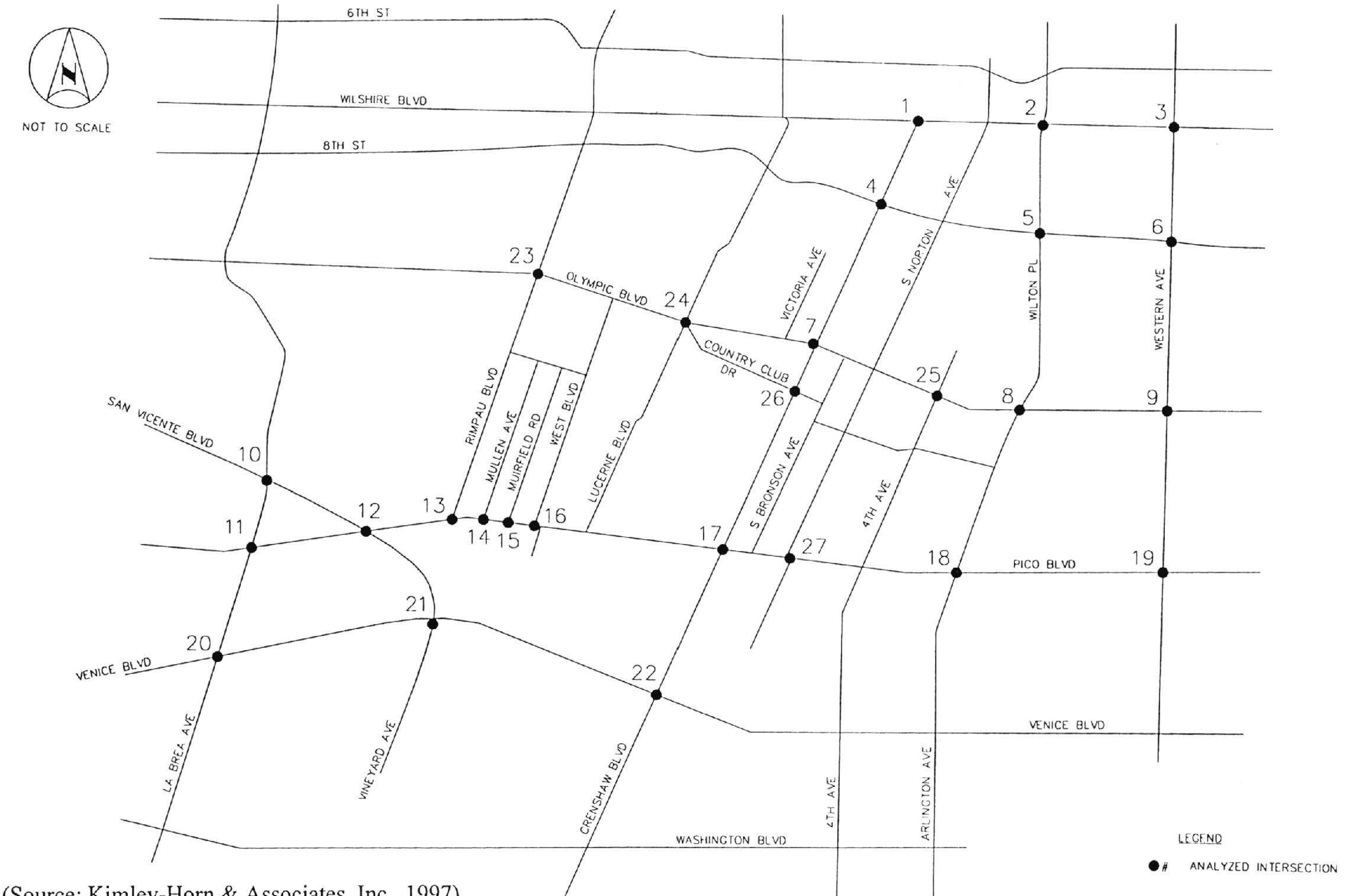
Traffic generated by the construction and operation of the proposed project was then estimated and assigned to the surrounding street system. For the construction period, traffic impacts are primarily made up of background traffic which would shift to other roadways due to construction activities. During project operation, traffic associated with new transit facilities would consist primarily of increased trips arriving and departing the proposed station locations. The sum of the Cumulative Base and project-generated traffic represents the Cumulative Plus Project conditions.

A total of 27 intersections have been identified in consultation with LADOT for the analysis of project operations. These 27 intersection will also be evaluated for construction-related impacts. A list of study intersections is provided on Table 7-4, and illustrated on Figure 7-3.

Table 7-4
Existing Intersection Level of Service

Study Intersection	AM Peak Hour		PM Peak Hour	
	V/C	LOS	V/C	LOS
1. Wilshire Bl & Crenshaw Bl	0.86	D	0.87	D
2. Wilshire Bl & Wilton Pl	0.77	C	0.71	C
3. Wilshire Bl & Western Ave	0.59	A	0.68	B
4. 8th St & Crenshaw Bl	0.63	B	0.67	B
5. 8th St & Arlington/Wilton Pl	***0.94***	***E***	***1.05***	***F***
6. 8th St & Western Ave	0.69	B	***1.42***	***F***
7. Olympic Bl & Crenshaw Bl	0.87	D	0.80	D
8. Olympic Bl & Arlington/Wilton Pl	0.80	C	0.79	C
9. Olympic Bl & Western Ave	0.79	C	0.75	C
10. La Brea Ave & San Vicente Bl	***0.97***	***E***	0.89	D
11. Pico Bl &La Brea Bl	0.83	D	0.88	D
12. Pico Bl &San Vicente Bl	0.72	C	0.65	B
13. Pico Bl &Rimpau Bl	***0.96***	***E***	0.77	C
14. Pico Bl &Mullen Ave	0.66	B	0.53	A
15. Pico Bl &Muirfield Rd (unsignalized)	***109.7***	***F***	***102.2***	***F***
16. Pico Bl &West Bl	0.80	C	0.69	B
17. Pico Bl &Crenshaw Bl	0.85	D	0.80	D
18. Pico Bl &Arlington Bl	0.64	B	0.64	B
19. Pico Bl &Western Ave	0.64	B	0.64	B
20. Venice Bl & La Brea Ave	0.87	D	***0.92***	***E***
21. Venice Bl & San Vicente Bl	0.87	D	0.79	C
22. Venice Bl & Crenshaw Bl	***0.91***	***E***	***1.03***	***F***
23. Olympic Bl & Rimpau Bl	0.89	D	***0.91***	***E***
24. Olympic Bl & Country Club	0.51	A	0.51	A
25. Olympic Bl & Fourth Ave	0.52	A	0.51	A
26. Crenshaw Bl & Country Club Dr	0.65	B	***1.04***	***F***
27. Pico Bl & Norton Ave	0.71	C	0.79	C

Bold and italicized numbers and letters identify intersections currently operating below acceptable levels.



(Source: Kimley-Horn & Associates, Inc., 1997)

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FIGURE 7-3
STUDY INTERSECTIONS

The methodologies and key assumptions used to develop these future forecasts used in this analysis are described below under construction and operation impacts.

Traffic Impact Significance Criteria

The City of Los Angeles Department of Transportation has established a set of standards for projects within the city to determine whether their traffic would have a significant impact on the local residential street. The LADOT standards indicate that a local residential street shall be deemed significantly impacted based on an increase in the projected average daily traffic (ADT) volumes:

Projected Average Daily Traffic with Project (Final ADT)	Project-Related Increase in ADT
1,000 or more	12 percent or more of final ADT
2,000 or more	10 percent or more of final ADT
3,000 or more	8 percent or more of final ADT

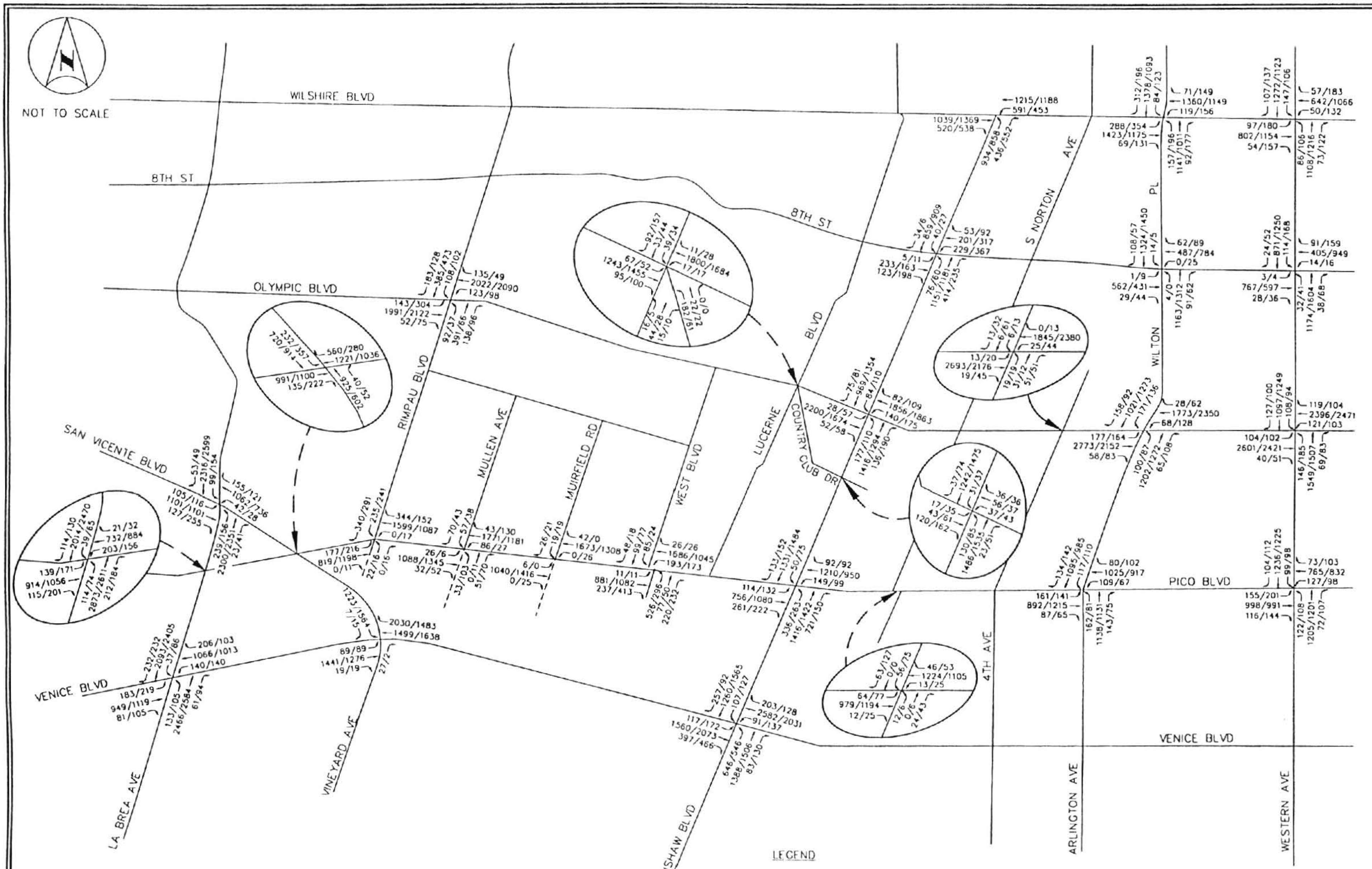
Intersection Traffic Impact Significance Criteria

Because this project is a transit project and not a development project, the intersection impact significance criteria which was utilized in the study is somewhat different than that developed by LADOT. The City of Los Angeles has acknowledged the fundamental difference between development activities and transit improvement activities in the adopted Transportation Land Use Policy and in the proposed Citywide General Plan Framework Element. This precedent has also been followed by the Red Line Eastern Extension and the MTA Gateway Project. Therefore, the significant impact criteria utilized in this study is defined as: an increase in volume-to-capacity ratio of 0.02 or greater at locations operating at level of service E or F.

Cumulative Base Traffic Projections

Cumulative Base (Year 2020) traffic projections were developed utilizing the travel demand model for the Los Angeles Community Plan Revision (CPR) studies for the Wilshire and West Adams-Baldwin Hills-Leimert Community Plan areas. These models were developed using the City of Los Angeles Citywide General Plan Framework travel demand forecasting model as the base, and establish projected Year 2010 traffic conditions. The models incorporate the assumptions and methodologies of the Southern California Association of Government (SCAG) regional model, with modifications to reflect future conditions in the City of Los Angeles. The models are used to develop forecasts of Year 2010 traffic conditions which reflect land use and socioeconomic conditions for Year 2010 in the project area as developed by the CPR program, and Year 2010 conditions for the remainder of the City consistent with the Framework.

The CPR models were used to establish projected traffic levels by Year 2010 for the street and highway system within the Metro Red Line Mid-City corridor project area. Since the MTA forecast year is Year 2020, but modeled data from the City of Los Angeles was available only to the Year 2010, updated Year 2020 socio-economic data obtained from SCAG was used to project further traffic growth in the area to the Year 2020. The resulting traffic volumes at the 27 intersections analyzed reflect projected Year 2020 Cumulative Base conditions, i.e., future conditions in Year 2020 without the Mid-City Segment. The resulting traffic volumes at the 27 analyzed intersections are shown on Figure 7-4.



(Source: Kimley-Horn & Associates, Inc., 1997)

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FIGURE 7-4
YEAR 2020 BASE PEAK HOUR TRAFFIC VOLUMES

Project traffic was then added to these cumulative base traffic volumes for Future With Project during Project Construction and Project Operations.

7.2.2.1 Construction Impacts

This study includes an analysis of the traffic-related impacts associated with construction of the project. Construction-period conditions have been compared to operating conditions prior to construction (Cumulative Base Year 2020 Conditions).

Project Traffic Volumes - Project Construction Period

During construction of portions of some of the project alternatives, lane and/or street closures would be necessary. For analysis purposes, construction-related closures were analyzed if street or lane closures would be required over an extended period of time, including weekdays, at a single location, or along a continuous corridor. For example, analysis has not been conducted for street or lane closures if they were anticipated to be limited to nighttime, weekend, or one- or two-day closures.

In general, cut-and-cover construction methodologies are designed to allow traffic flow to be maintained on the affected street while excavation and construction takes place below the street level. Cut-and-cover activities would involve limited-duration lane closures to install vertical support beams (called soldier piles) on either side of the street, and to lay concrete decking over the excavation site. The cut-and-cover process would require the closure of one lane in each direction during the installation of soldier piles. Deck installation would require full street closure, but this activity would only occur between the hours of 11 PM to 5 AM or all day on weekends. Alternatively, short-term two- to five-day (all-day) street closures may be preferred by residents, to concentrate the street closures to a shorter period of time. Once the soldier piles and decking are in place, all travel lanes would be re-opened to traffic. ~~and~~ On-street parking would be restored over the tunnel excavation sections ~~site~~ throughout the construction process~~, once the soldier piles and decking are in place~~. Parking would not be allowed on the decking over the station box excavation site due to the need for vent shafts and emergency exits outside the footprint of the station box.

A definitive schedule of all construction activities cannot be identified at this time. However, it is possible to identify which activities are anticipated to require substantial street or lane closures, and the locations where concentrated construction impacts may occur over an extended period of time. Based on information provided on construction practices, two construction scenarios have been identified. These scenarios, which represent different periods of the construction activities, were aimed at identifying the potential worst case traffic conditions for each alternative. Construction activities would take place prior to the Project Operations phase, and therefore, for worst-case analysis purposes, are analyzed in the Cumulative Base Conditions (Year 2020 without the project).

Construction Impacts Associated with Alternative A

The relocation and construction of new sewers and storm drains within local streets would effect traffic flow patterns. The streets where utility relocation would occur include:

- Crenshaw Boulevard north and south of Pico Boulevard,
- Pico Boulevard between Windsor Boulevard and West Boulevard,
- Queen Anne Place between Dockweiler Street and Pico Boulevard,
- West Boulevard between Pico Venice Boulevards.

Cut-and-cover activities associated with construction of the twin tunnels in Pico Boulevard between West Boulevard and Victoria Avenue, and the Olympic/Arlington Station would require short-term lane closures on Pico Boulevard and Arlington Avenue, respectively. These lane closures would be expected to be limited to weekends and nighttimes. Since the Olympic/Arlington Station would be located completely in Arlington Avenue, south of Olympic Boulevard, closure of Olympic Boulevard would not be required. Substantial impacts to traffic flow associated with construction of the Olympic/Arlington Station would not be expected. During the closures on Arlington Avenue north/south traffic would be diverted to Crenshaw Boulevard to the west and Western Avenue to the east. During closures on Pico Boulevard east/west traffic would be diverted to Venice Boulevard.

Construction activities associated with construction of the Pico/San Vicente Station is expected to require short-term lane closures along Pico Boulevard.

For the purposes of this analysis, based on typical construction phasing practices, it is assumed that no more than two adjacent street segments would be affected at one time. Based on the projected traffic volumes for the project area under the Cumulative Base conditions, it was determined that the closure of one lane in each direction on the Pico Boulevard segments and short-term closure of Crenshaw Boulevard on either side of Pico Boulevard would have the greatest effect on the circulation patterns within the study area. Therefore, conditions assumed and assessed for Alternative A Construction Impacts are that Pico and Crenshaw Boulevards would be reduced by one lane in each direction during the same time period.

The potential impact of the closure of one lane in each direction on these two roadways was estimated using the CPR model, which indicates that approximately 30 percent of the traffic on each facility would shift to outer parallel routes in the project area. Traffic diverting off Pico Boulevard to avoid congestion would shift primarily to Olympic and Venice Boulevards, depending on the ultimate destination. Traffic diverting off Crenshaw Boulevard would shift primarily to Bronson Avenue and Arlington Avenue to the east, and to a lesser extent, La Brea Avenue and Rimpau Boulevard to the west. Olympic and Venice Boulevards would also experience some increase in traffic during the construction period on Crenshaw Boulevard. Using the traffic diversion patterns indicated by the CPR model, manual adjustments were made to the Year 2020 Cumulative Base traffic volumes to shift traffic off the affected segments of Pico and Crenshaw Boulevards.

It should be noted that (as a worst case) truck hauling activity associated with the tunneling operation would also occur at the same time as the cut-and-cover activities. Based on information regarding the volume of daily truck activity and the scheduled hours of this activity, it is estimated that approximately 50 truck trips would be on the street system during both the morning and evening peak hours.

Construction Impacts Associated with Alternative B1 and B2

The relocation and construction of new sewers and storm drains within local streets would effect traffic flow patterns. The streets where utility relocation would occur include:

- Crenshaw Boulevard north and south of Venice Boulevard
- Venice Boulevard between Victoria Avenue and West Boulevard

Cut-and-cover activities associated with construction of the twin tunnels in Venice Boulevard between West Boulevard and Victoria Avenue, and the Olympic/Arlington Station would require short-term lane closures on Venice Boulevard and Arlington Avenue, respectively. These lane closures would be expected to be limited to weekends and nighttimes. Since the proposed station would be located completely in Arlington Avenue, south of Olympic Boulevard, closure of Olympic Boulevard would not be required. Substantial impacts to traffic flow associated with construction of the Olympic/Arlington Station would not be expected. During the closures on

Arlington Avenue north/south traffic would be diverted to Crenshaw Boulevard to the west and Western Avenue to the east. During closures on Venice Boulevard east/west traffic would be diverted to Pico Boulevard.

Construction activities associated with construction of the Venice/San Vicente Station is expected to require short-term lane closures along Pico and Venice Boulevards.

Once again, based on typical construction phasing practices, it is assumed that no more than two adjacent street segments would be affected at one time. Based on the projected traffic volumes for the project area under the Cumulative Base conditions, it was determined that the closure of one lane in each direction on the Venice Boulevard segments and short-term closure of Crenshaw Boulevard on either side of Venice ~~Pico~~ Boulevard would have the greatest effect on the circulation patterns within the project area. Therefore, conditions assumed and assessed for Alternative B Construction Impacts are that Venice Boulevard and Crenshaw Boulevard would be reduced by one lane in each direction during the same time period. Traffic diverting off Venice Boulevard to avoid construction congestion would shift primarily to Pico Boulevard and, to some extent, Olympic Boulevard, depending upon the ultimate destination. Traffic diverting off Crenshaw Boulevard would shift primarily to Bronson Avenue and Arlington Avenue to the east, and to a lesser extent, La Brea Avenue and West Boulevard to the west. Washington and Pico Boulevards would also experience some increase in traffic during the construction period on Crenshaw Boulevard.

As with Alternative A, truck hauling activity was also assigned to the street network and is reflected in the traffic projections.

Construction Impacts Associated with Alternative C

The relocation and construction of new sewers and storm drains within local streets would effect traffic flow patterns. The streets where utility relocation would occur include:

- Ninth Street between 5th Avenue and Crenshaw Boulevard
- Victoria Avenue between Ninth Street and Country Club Drive
- Bronson Avenue south of Country Club Drive
- Pico Boulevard between Windsor Boulevard and West Boulevard
- Queen Anne Place between Dockweiler Street and Pico Boulevard
- West Boulevard between Pico Boulevard and Venice Boulevard

Cut-and-cover activities associated with construction of the twin tunnels in Pico Boulevard and Crenshaw Boulevard and the Olympic/Crenshaw Station would require short-term lane closures on Pico Boulevard and Crenshaw Boulevard, respectively. These lane closures would be expected to be limited to weekends and nighttimes. Cross streets, such as Country Club Drive, Olympic Boulevard, and 8th Street would also experience short-term lane closures during cut-and-cover construction within the Crenshaw Boulevard right-of-way.

Once again, based on typical construction phasing practices, it is assumed that no more than two adjacent street segments would be affected at one time. Based on the projected traffic volumes for the study area under the Cumulative Base conditions, it was determined that the closure of one lane in each direction on the Pico and Crenshaw Boulevard segments would have the greatest effect on the circulation patterns within the study area. Therefore, conditions assumed and assessed for Construction Impacts of Alternative C are that Pico and Crenshaw Boulevards would be reduced by one lane in each direction during the same time period. Traffic diverting off Pico Boulevard to avoid congestion would shift primarily to Olympic and Venice Boulevards, depending on the ultimate destination. Traffic diverting off Crenshaw Boulevard would shift primarily to Bronson Avenue and Arlington

Avenue to the east, and to a lesser extent, La Brea Avenue and Rimpau Boulevard to the west. Olympic and Venice Boulevards would also experience some increase in traffic during the construction period on Crenshaw Boulevard.

It should be noted that truck hauling activity was also assigned to the street network and is reflected in the traffic projections.

The impacts of this diversion of traffic during construction activities are presented in Section 7.2.3.1.

7.2.2.2 Operational Impacts

Traffic generated by the operation of the proposed project was estimated and assigned to the surrounding street system. During project operation, traffic associated with new transit facilities would consist primarily of increased trips arriving and departing the proposed station locations. The sum of the Cumulative Base and project-generated traffic represents the Cumulative Plus Project conditions.

Cumulative Base Transportation System Improvements

The completion of the City's ATSAC system encompassing the remaining signalized study intersections (which are not currently under ATSAC system) is planned and is assumed to be completed and operational as part of future base transportation system. As discussed earlier under Existing Conditions, ATSAC is already operational at 20 of the 26 signalized study intersections. The City is planning to install ATSAC at the remaining six intersections in the near future. Therefore, under Cumulative Base conditions all 26 existing signalized intersections are assumed to be included in the ATSAC system.

Project Traffic Volumes - Project Operations

By attracting new transit riders to the subway system, it is projected that the Metro Red Line would generally reduce overall vehicle trip-making within the study area. The previous SEIS/SEIR, *Los Angeles Rail Rapid Transit Project - Metro Rail for the Mid-City Segment from Wilshire/Western to Pico/San Vicente in the City of Los Angeles with Stations at Olympic/Crenshaw and Pico/San Vicente, Final Supplemental Environmental Impact Statement and Final Supplemental Environmental Impact Report* (U.S. Department of Transportation, et al, 1992), estimated that construction of the Red Line could result in a reduction of up to 5% of the overall traffic on arterials within the Mid-City corridor. However, for study purposes, and as a conservative assumption to represent a "worst case analysis," future forecasts assumed no reductions in traffic as a result of Red Line implementation.

Completion and operation of the Mid-City segment of the Metro Red Line would result in increased vehicular and pedestrian activity on streets surrounding the two proposed rail stations, as well as increased transit ridership in the vicinity of the station. The increased level of activity which could result from park-and-ride and kiss-and-ride facilities served as the basis for project traffic estimates for the Project Operations phase. The development of traffic generation estimates for the proposed Mid-City stations was based on patronage projections supplied by MTA for the Olympic/Arlington and Pico/ or Venice/San Vicente Stations for Alternatives A and B, and for the proposed Olympic/Crenshaw and Pico/San Vicente Stations for Alternative C.

Project Traffic Generation

Base Data and Assumptions -- Project trip generation estimates for each proposed station were developed using projected patronage at each station, and the anticipated mode of arrival and departure. Daily and morning peak hour patronage forecasts and mode of arrival data for the proposed stations was obtained from the MTA and are presented on Table 7-5 (Alternatives A and B) and Table 7-6 (Alternative C).

Table 7-5 Ridership and Mode of Access Forecasts for Alternatives A & B (Year 2020)						
Mode of Access	Olympic/Arlington Station			Pico or Venice/San Vicente Station		
	Daily	AM Peak Hour		Daily	AM Peak Hour	
		Arrival	Departure		Arrival	Departure
Auto	175	33	0	2,145	411	0
Bus	2,061	336	240	8,553	1,254	1,152
Walk	639	68	52	648	72	65
TOTAL	2,875	437	292	11,346	1,737	1,217

Table 7-6 Ridership and Mode of Access Forecasts for Alternative C (Year 2020)						
Mode of Access	Olympic/Crenshaw Station			Pico/San Vicente Station		
	Daily	AM Peak Hour		Daily	AM Peak Hour	
		Arrival	Departure		Arrival	Departure
Auto	333	61	0	2,038	390	0
Bus	1,679	255	161	8,572	1,274	1,127
Walk	1,614	218	191	658	75	79
TOTAL	3,626	534	352	11,268	1,739	1,206

These ridership projections were used, along with the following assumptions, to develop the peak hour vehicle trip generation estimates for each station.

- For patrons accessing the station by "Auto," data supplied by MTA did not distinguish between the park-and-ride and kiss-and-ride modes of access. The Olympic/Crenshaw and Olympic/Arlington Stations would not have park-and-ride facilities, so all patrons accessing those Stations by automobile would be kiss-and-ride patrons. The percentage split between the park-and-ride and kiss-and-ride modes of arrival/ departure for the Pico/ or Venice/San Vicente Station was developed using data from the 1992 SEIS/SEIR, which assumed a 65% park-and ride and 35% kiss-and-ride split.

- Based on data from the *Pasadena - Los Angeles Light Rail Transit Project Revised Draft Environmental Impact Report* (LACTC, November, 1989), the average auto occupancy for park-and-ride patrons is assumed to be 1.3 persons. This assumption is consistent with the goals and objectives of the SCAG Regional Mobility Element, which includes strategies to, among other things, " ... increase vehicle occupancy for both passenger and transit vehicles, and reduce the number of commute and non-commute trips."

- An average vehicle occupancy (AVO) of 2.0 (one driver and one Red Line patron) was assumed for kiss-and-ride patrons. This ensures that a conservative trip generation estimate was used for this type of trip.

- Using data from the 1992 SEIS/SEIR, an occupancy rate of 35 patrons per bus was assumed.

- The patronage data from the MTA model did not include forecasts for the evening peak hour. For the purposes of this study, it was assumed that the evening peak hour arrival/departure pattern would be the reverse of the morning peak hour and that the rates and percentage splits for auto trips and the bus occupancy would be similar.

Using ridership forecasts and the above-mentioned assumptions, station access traffic generation estimates were developed. Trip generation information is presented on Table 7-7 for the Olympic/Arlington and Pico or Venice/San Vicente Stations (Alternatives A and B) and on Table 7-8 for the Olympic/Crenshaw and Pico/San Vicente Stations (Alternative C).

Trip Credits -- The station access trip generation estimates were adjusted to provide credits for the existing land uses located on the station sites which would be removed as part of the development of the stations. The trip generation estimates for these existing land uses were developed by applying the appropriate trip generation rates provided by the Institute of Transportation Engineers' (ITE) *Trip Generation*, 5th Edition (1991) and the San Diego Association of Governments' (SANDAG) *Traffic Generators*, (1993) to these land uses. The trip generation estimates for existing uses on the proposed stations sites, are summarized in Tables 7-7 and 7-8. The difference in daily and peak hour traffic represents the net trip generation anticipated to result from construction and operation of the proposed station sites along the three alignments.

Project Traffic Distribution

Distribution of station traffic to the surrounding roadway system is dependent on geographic distribution of the population from which the potential patrons would be drawn, the level of congestion on local streets, and the physical characteristics of the street system. The distribution patterns utilized in this study were based on data from the Los Angeles Community Plan Revision (CPR) travel demand forecasting models, observations of traffic patterns in the area, and traffic engineering judgment.

Separate distribution patterns were developed for existing site traffic (to be deducted from Cumulative Base traffic) and for the station access traffic for each of the stations. The patterns used in this study, which are summarized below, are illustrated in Figure 7-5 for the Olympic/Arlington Station, Figure 7-6 for the Olympic/Crenshaw Station, and Figure 7-7 for the Pico/ or Venice/San Vicente Station.

Table 7-7
Estimated Trip Generation - Mid-City Segment
Alternatives A and B

Land Use	Quantity		Daily Veh. Trips	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total
Olympic/Arlington Station									
Station Access Traffic									
Kiss-and-Ride [a]	175	patrons	700	33	33	66	33	33	66
Bus [a]	2,061	patrons	118	16	16	32	16	16	32
	Subtotal		818	49	49	98	49	49	98
Existing Uses									
Medical Office Building	12,899	sf	441	27	8	35	16	37	53
Retail (Specialty Retail)	5,280	sf	211	4	3	7	10	10	20
	Subtotal		652	31	11	42	26	47	73
Net Total for Olympic/Arlington Station			**166**	**18**	**38**	**56**	**23**	**2**	**25**
San Vicente Station at Pico or Venice									
Station Access Traffic									
Park and Ride [a]	1,394	patrons	2,145	175	31	206	31	175	206
Kiss-and-Ride [a]	751	patrons	3,004	144	144	288	144	144	288
Bus [a]	8,553	patrons	489	69	69	138	69	69	138
Bus Adjustments									
Bus Traffic already in project vicinity				(45)	(45)	(90)	(40)	(40)	(80)
Additional buses accessing station				16	16	32	6	6	12
	Subtotal		5,638	359	215	572	210	354	564
Existing Uses									
Garden Center	15,000	sf	600	11	7	18	30	30	60
Builder Supply	81,850	sf	2,501	116	57	173	126	142	268
	Subtotal		3,101	127	64	191	156	172	328
Net Total for Pico/ or Venice/San Vincente Station			**2,537**	**233**	**151**	**383**	**54**	**182**	**236**

Notes:
[a] Assumes an average vehicle occupancy (AVO) of 1.3 for Park-and-Ride patrons, an overall AVO of 2.0 for Kiss-and-Ride patrons, (one driver and one Red Line patron), and 35 patrons per bus. Assumes that 85% of Park-and-Ride Traffic is going to the train, and 15% is departing the train.
sf = square feet

TABLE 7-8
Estimated Trip Generation - Mid-City Segment
Alternative C

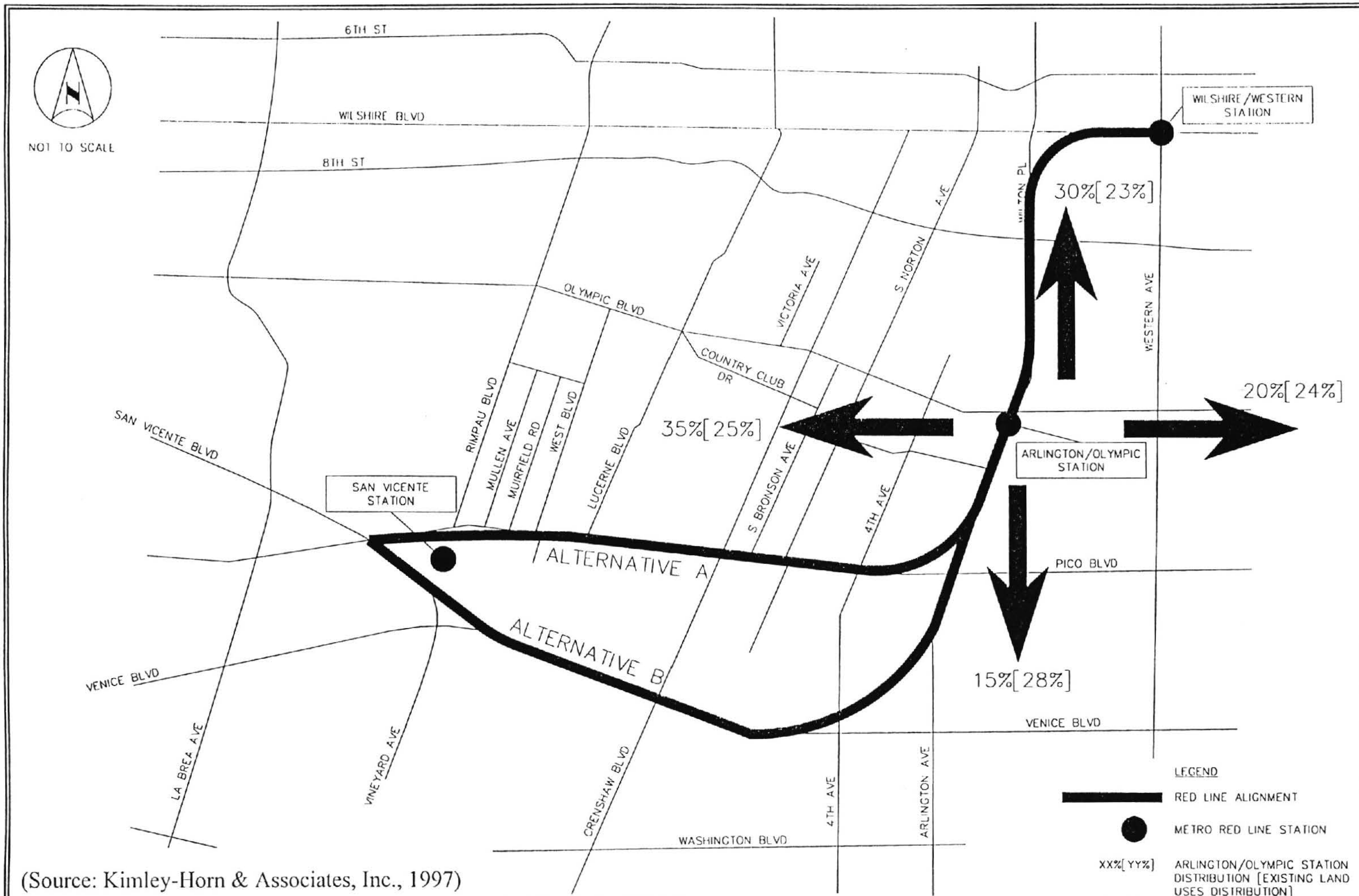
Land Use	Quantity	Daily Veh. Trips	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total
Olympic/Crenshaw Station								
Station Access Traffic								
Kiss-and-Ride [a]	333 patrons	1,332	61	61	122	61	61	122
Bus [a]	1,679 patrons	96	12	12	24	12	12	24
	Subtotal	1,428	73	73	146	73	73	146
Existing Uses								
Retail (Strip Commercial)	6,843 sf	274	5	3	8	12	12	24
Gas Station	10 pumps	1,628	50	50	100	40	40	80
Pass-by Reduction [b]		(814)	(25)	(25)	(50)	(20)	(20)	(40)
Retail (Strip Commercial)	4,566 sf	183	3	2	5	8	8	16
	Subtotal	1,271	33	30	63	40	40	80
Net Total for Olympic/Crenshaw Station		**157**	**40**	**43**	**83**	**33**	**33**	**66**
Pico/San Vicente Station								
Station Access Traffic								
Park and Ride [a]	1,325 patrons	2,038	166	29	195	29	166	195
Kiss-and-Ride [a]	713 patrons	2,852	137	137	274	137	137	274
Bus [a]	8,572 patrons	490	69	69	138	69	69	138
Bus Adjustments								
Bus Traffic already in project vicinity			(45)	(45)	(90)	(40)	(40)	(80)
Additional buses accessing station			16	16	32	6	6	12
	Subtotal	5,380	343	206	549	201	338	539
Existing Uses								
Garden Center	15,000 sf	600	11	7	18	30	30	60
Builder Supply	81,850 sf	2,501	116	57	173	126	142	268
	Subtotal	3,101	127	64	191	156	172	328
Net Total for Pico/San Vicente Station		**2,279**	**216**	**141**	**358**	**45**	**166**	**211**

Notes:

[a] Assumes an AVO (average vehicle occupancy) of 1.3 for Park-and-Ride patrons, an overall AVO of 2.0 for Kiss-and-Ride patrons, (one driver and one Red Line patron), and 35 patrons per bus. Assumes that 85% of Park-and-Ride traffic is going to the train, and 15% is departing the train.

[b] Assumes 50% reduction on trip generation for gas station pass-bys trips -- trips already on the roadway system that stops into the site, on its way from one place to another.

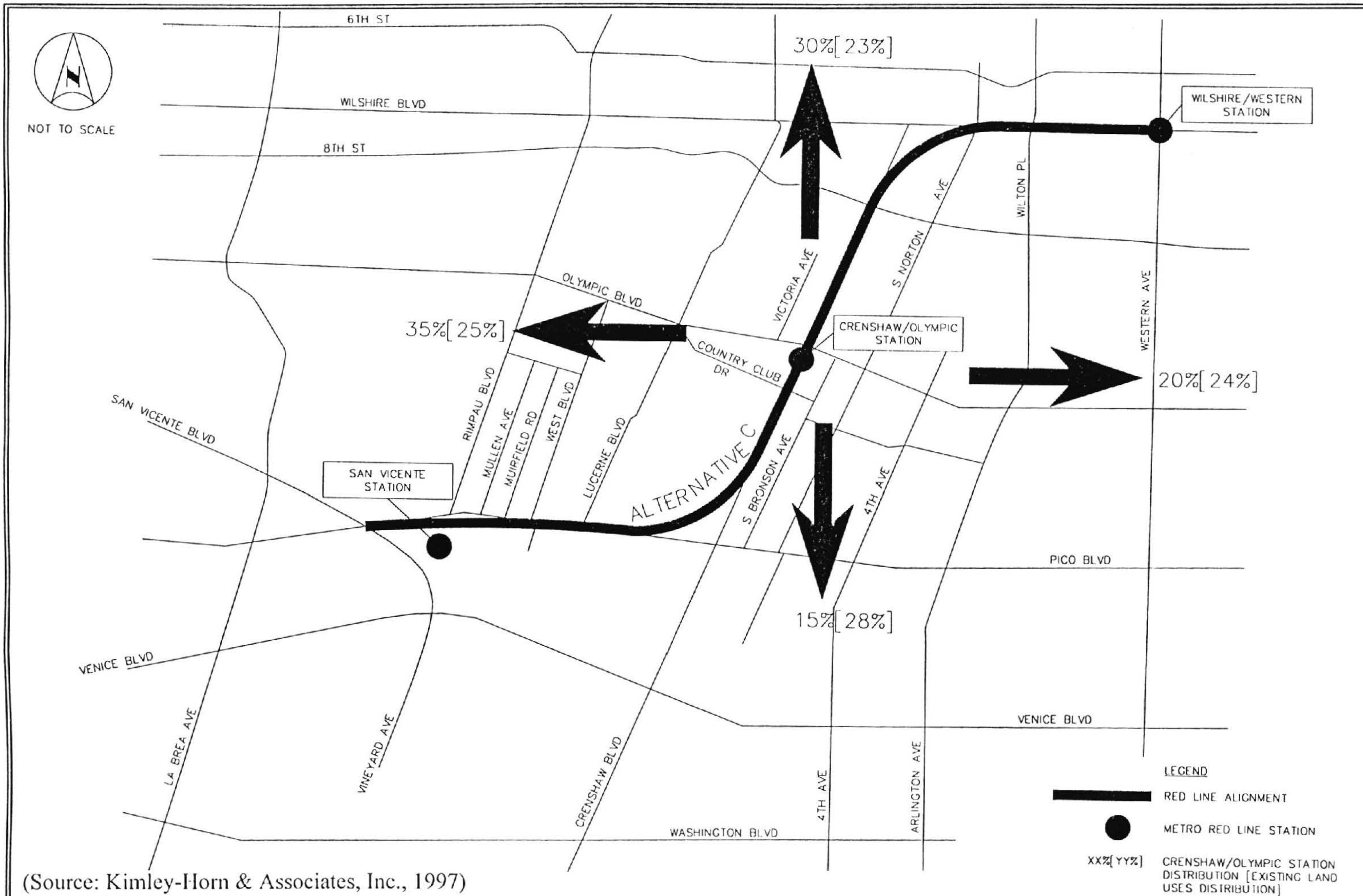
sf = square feet



(Source: Kimley-Horn & Associates, Inc., 1997)

ULTRASYSTEMS ENVIRONMENTAL INCORPORATED

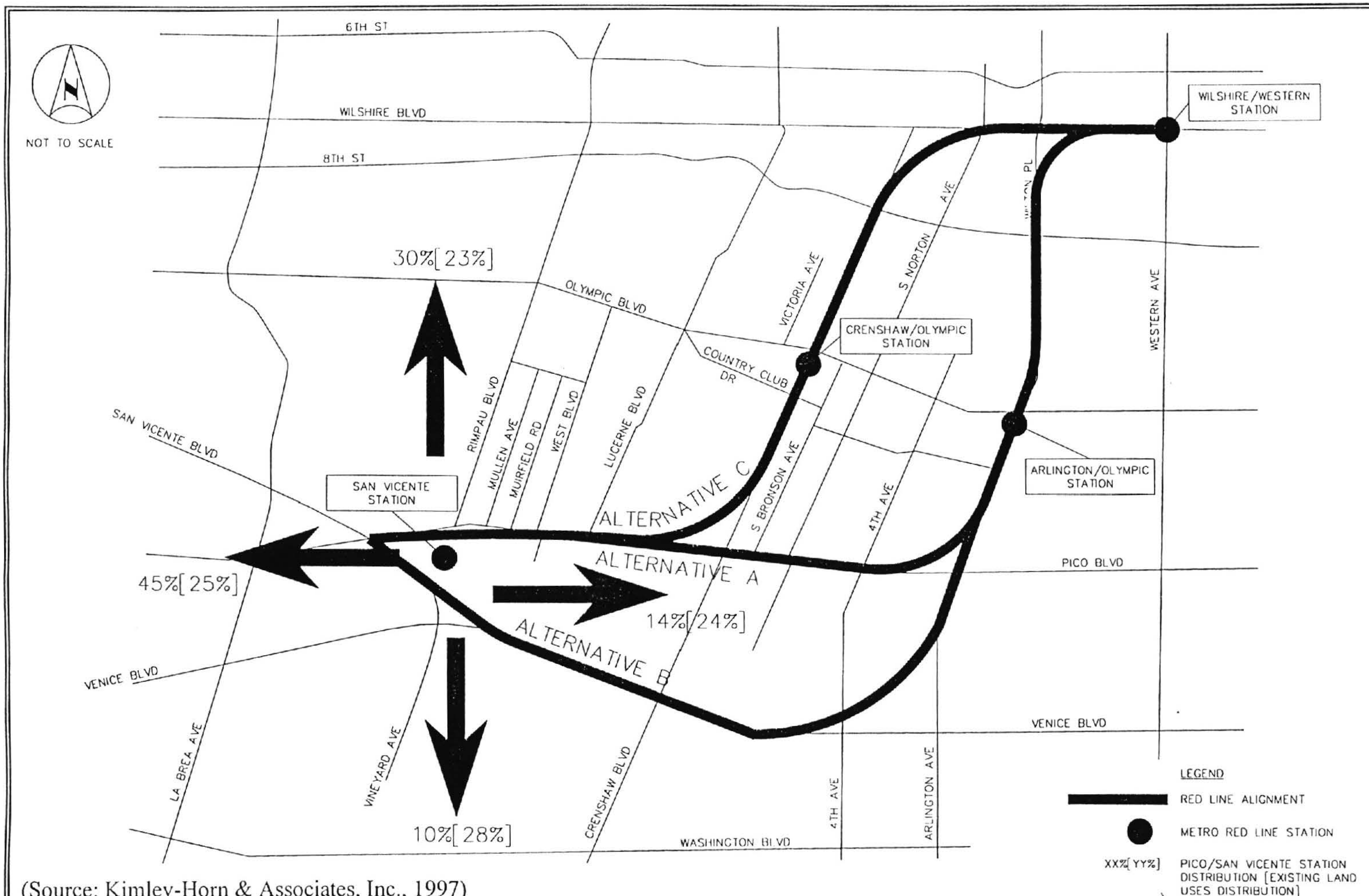
FIGURE 7-5
DISTRIBUTION PATTERNS FOR OLYMPIC/ARLINGTON STATION & EXISTING LAND USES



(Source: Kimley-Horn & Associates, Inc., 1997)

ULTRASYSTEMS ENVIRONMENTAL INCORPORATED

FIGURE 7-6
DISTRIBUTION PATTERNS FOR OLYMPIC/CRENSHAW STATION & EXISTING LAND USES



(Source: Kimley-Horn & Associates, Inc., 1997)

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FIGURE 7-7

DISTRIBUTION PATTERNS FOR SAN VICENTE STATION & EXISTING LAND USES (ALTERNATIVES A, B1, B2, AND C)

Trip Distribution Assumptions for Traffic Generated by Existing Uses and Future Station Traffic

	Existing Uses	Station
Olympic/Arlington		
North	23%	30%
East	24	20
South	28	15
West	25	35
Olympic/Crenshaw		
North	23%	30%
East	24	20
South	28	15
West	25	35
Pico San Vicente and Venice/San Vicente		
North	23%	30%
East	24	14
South	28	10
West	25	46

Project Traffic Assignment

The trip distribution patterns described above were used to assign the trips expected to be generated by each station. It should be recognized that the traffic volumes from the existing land uses were *subtracted* from the street system while the station access traffic volumes were added to the street system. Figures 7-8 and 7-9 provide the peak hour traffic volumes at each of the 27 analyzed intersections for project operations for Alternatives A and B, and Alternative C, respectively. As shown, some peak hour turning movements are projected to be negative at some locations because of the trip credits taken for the existing uses.

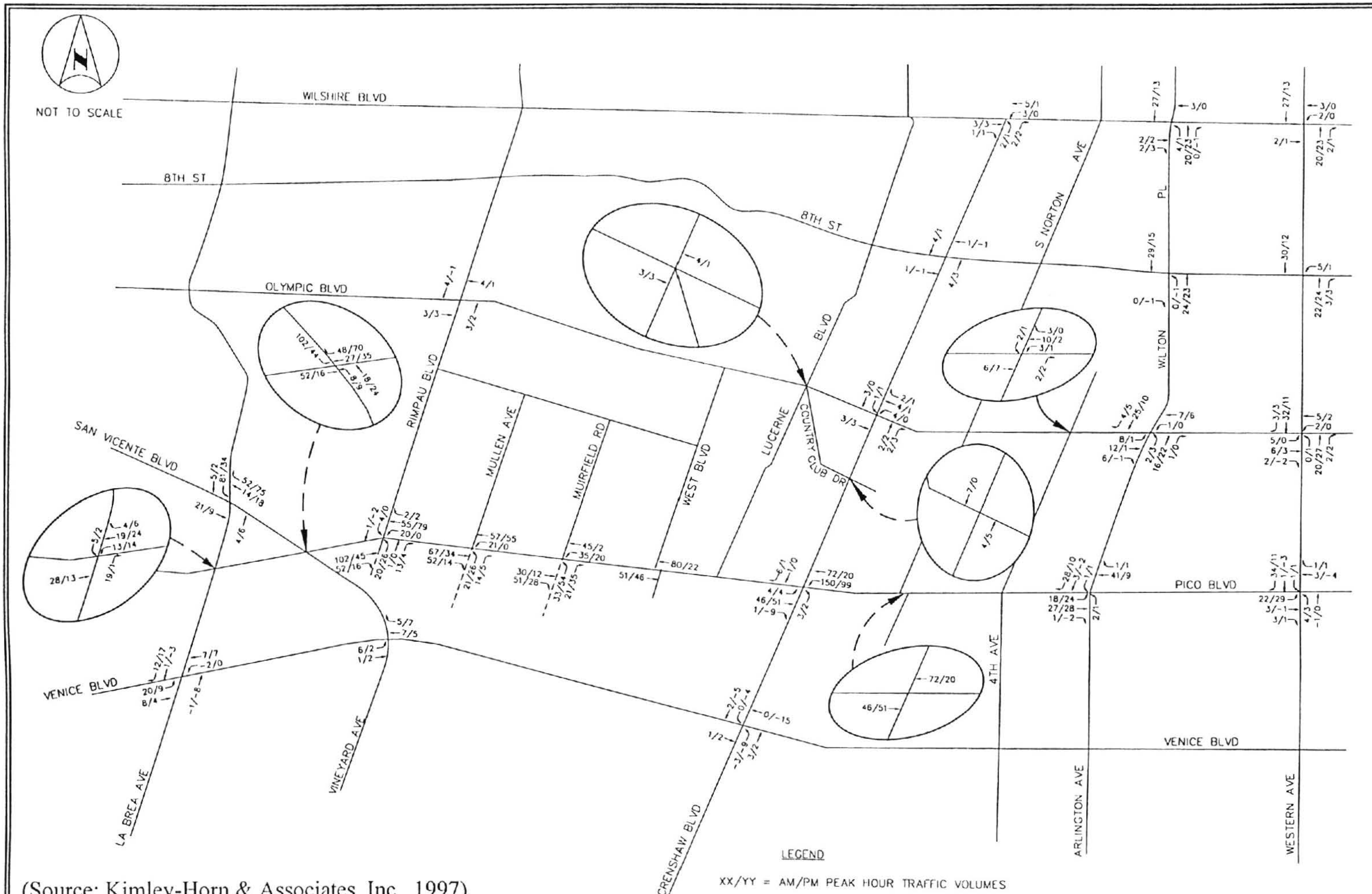
Project traffic volumes were then added to the Cumulative Base traffic projections, with the resulting traffic forecasts representing the Cumulative Plus Project Operation peak hour traffic volumes. These volumes are presented on Figure 7-10 for Alternatives A and B, and on Figure 7-11 for Alternative C.

Transportation System Impacts

The impact of the proposed Metro Red Line Mid-City Segment on the transportation system within the study area is presented in this section. To assess impacts on the street system, the analysis compares the projected levels of service at each study intersection under Cumulative Base (Year 2020) and Cumulative Plus Project conditions to determine the potential traffic impacts of the Project Construction and Project Operations. Neighborhood impacts were evaluated by measuring the amount of project traffic anticipated on adjacent neighborhood streets, and applying the City of Los Angeles Neighborhood Impact threshold impact criteria.

Cumulative Base Traffic Conditions (No Project)

The projected Year 2020 Cumulative Base peak hour traffic volumes were analyzed to determine the projected V/C ratio, reserve capacity and level of service for each of the analyzed intersections. Table 7-9 summarizes these results. As indicated in Table 7-9, 18 of the study intersections are projected to operate at LOS E or F during one or both peak hours under Cumulative Base conditions.



(Source: Kimley-Horn & Associates, Inc., 1997)

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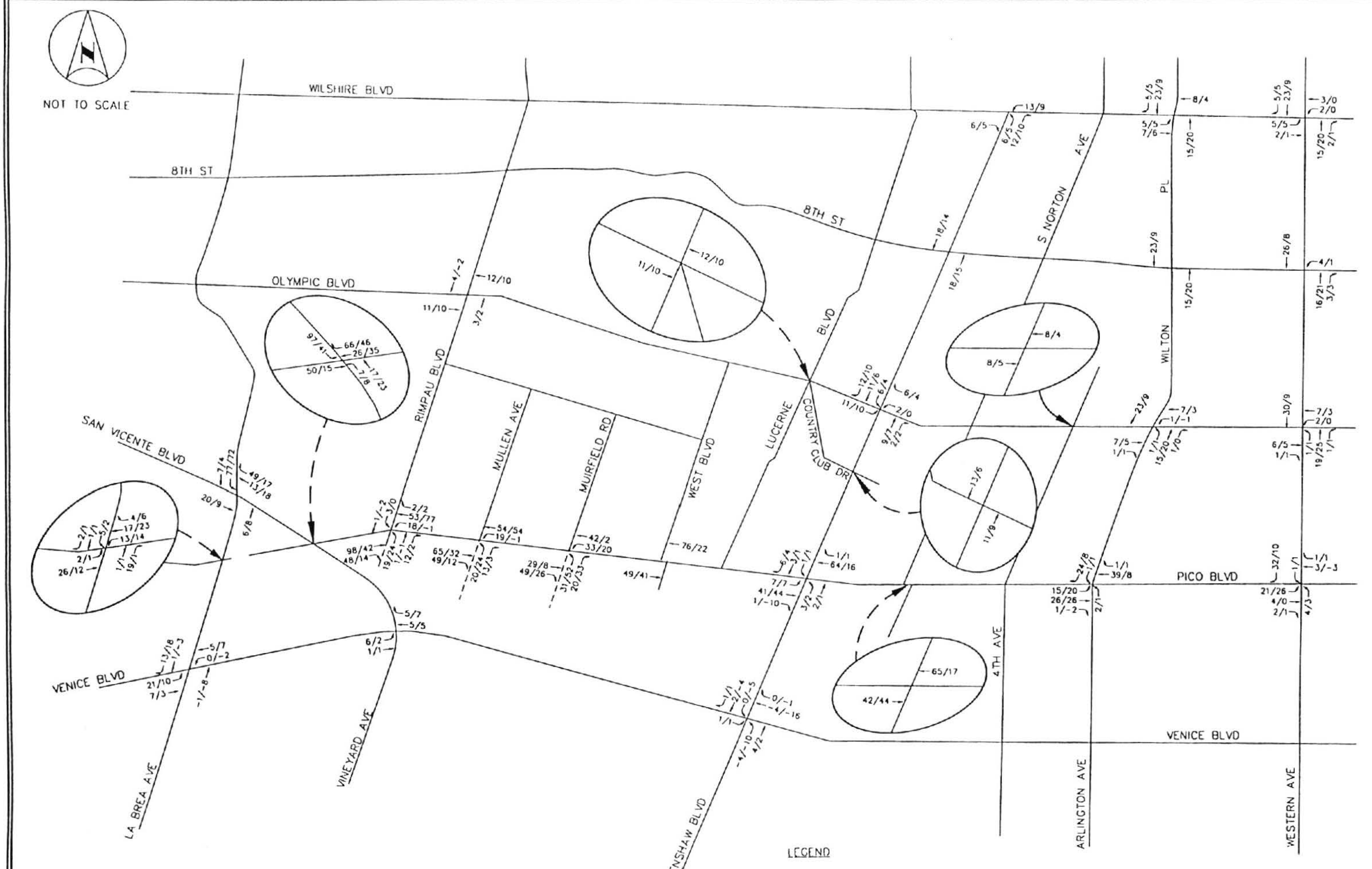
FIGURE 7-8
PROJECT PEAK HOUR TRAFFIC VOLUMES - ALTERNATIVES A, B1 & B2 (WILTON/ARLINGTON)



(Source: Kimley-Horn & Associates, Inc., 1997)

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FIGURE 7-9

PROJECT PEAK HOUR TRAFFIC VOLUMES - ALTERNATIVE C (CRENSHAW/PICO)

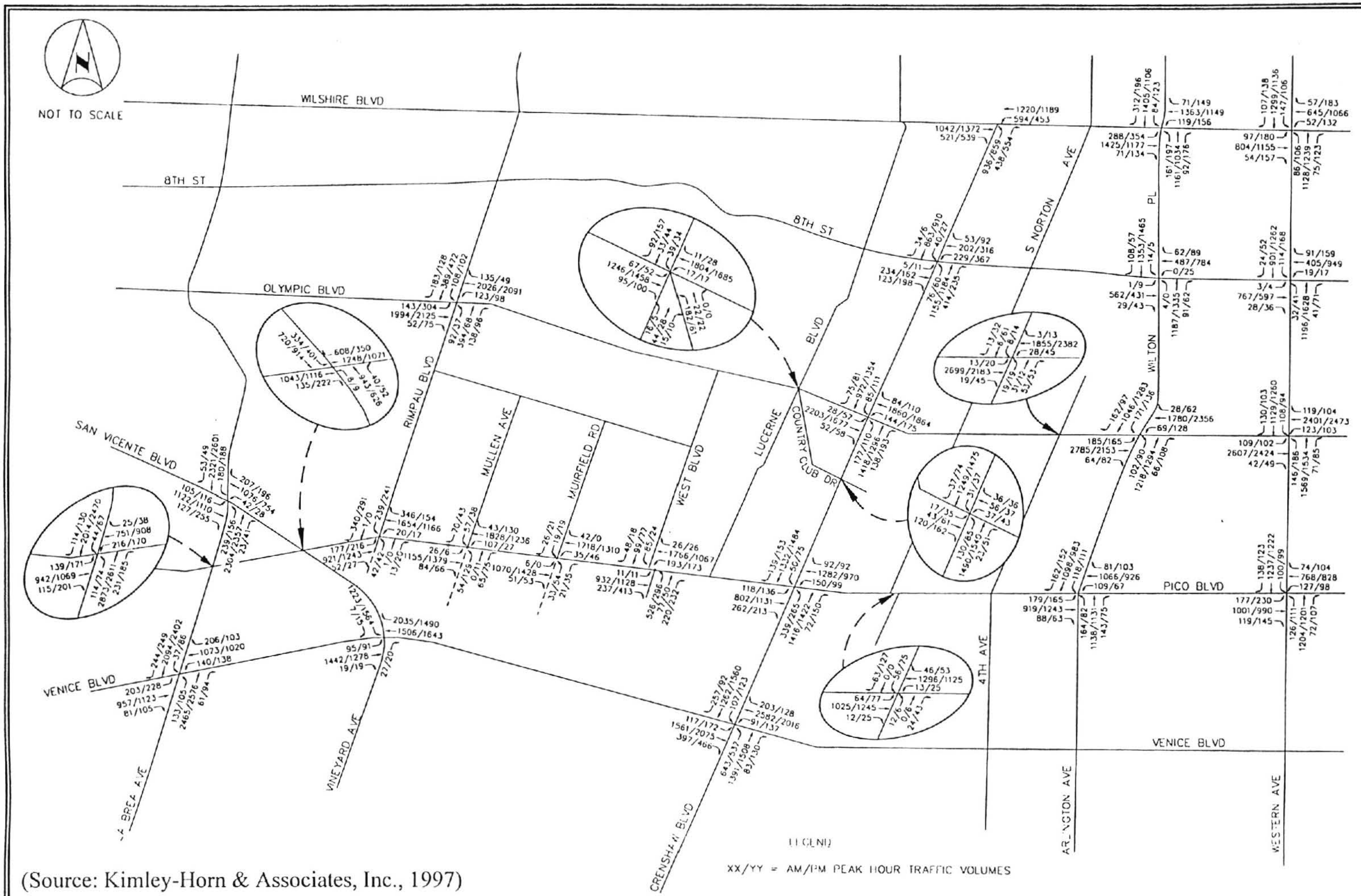

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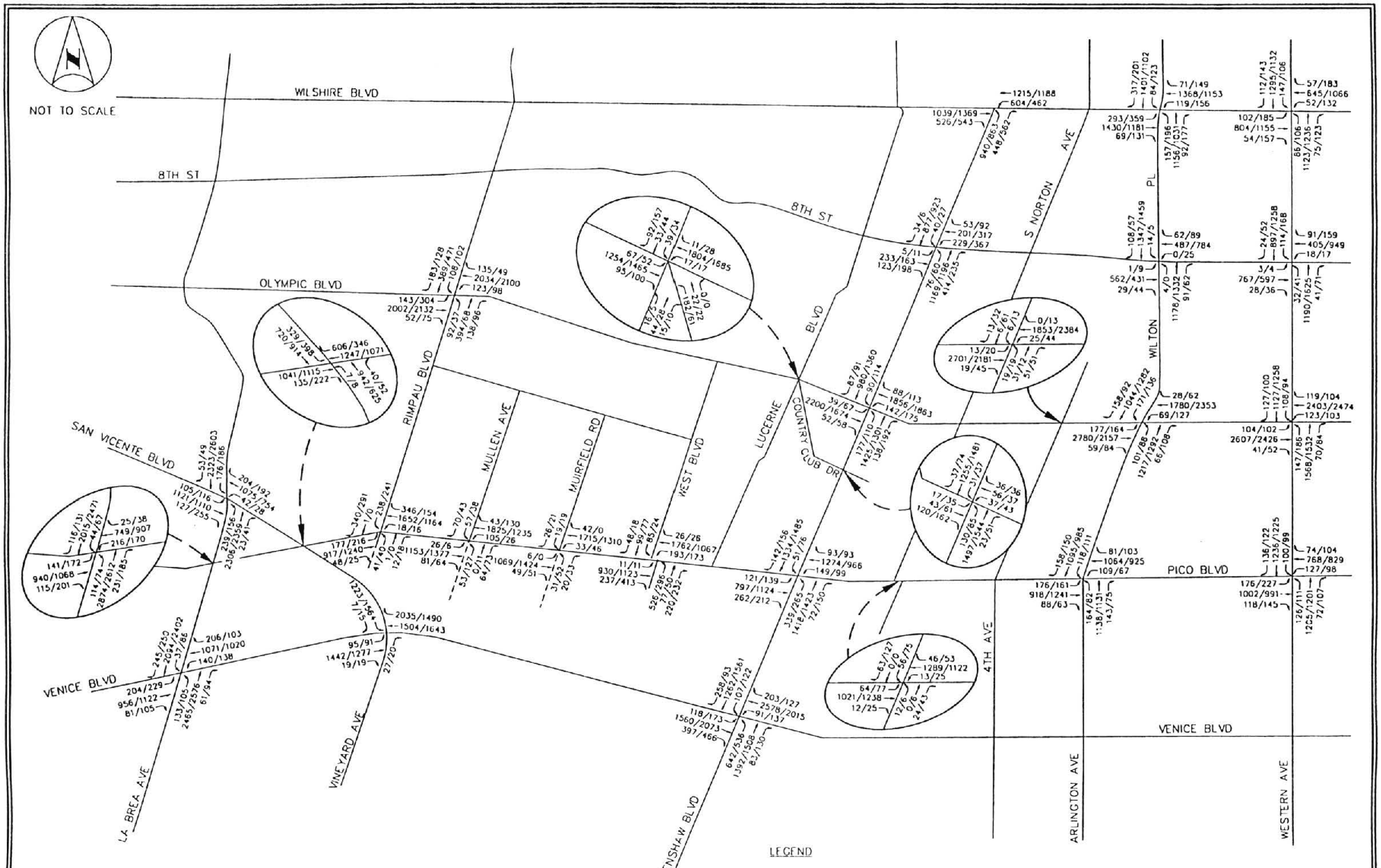
FIGURE 7-10

YEAR 2020 BASE PLUS PROJECT PEAK HOUR TRAFFIC VOLUMES - ALTERNATIVES A & B (WILTON/ARLINGTON)



(Source: Kimley-Horn & Associates, Inc., 1997)

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FIGURE 7-11

YEAR 2020 BASE PLUS PROJECT PEAK HOUR TRAFFIC VOLUMES - ALTERNATIVE C (CRENSHAW/PICO)

Table 7-9
Cumulative Base Year 2020 Intersection Level of Service Analysis

Intersection	Peak Hour	Existing		Cumulative Base	
		V/C	LOS	V/C	LOS
1. Wilshire Boulevard & Crenshaw Boulevard	AM	0.861	D	1.024	F
	PM	0.869	D	1.015	F
2. Wilshire Boulevard & Wilton Place	AM	0.774	C	1.101	F
	PM	0.707	C	1.014	F
3. Wilshire Boulevard & Western Avenue	AM	0.591	A	0.729	C
	PM	0.768	C	0.899	D
4. 8th Street & Crenshaw Boulevard	AM	0.629	B	0.766	C
	PM	0.670	B	0.810	D
5. 8th Street & Arlington/Wilton Place	AM	0.936	E	1.228	F
	PM	1.049	F	1.326	F
6. 8th Street & Western Avenue	AM	0.695	B	0.874	D
	PM	0.971	E	1.183	F
7. Olympic Boulevard & Crenshaw Boulevard	AM	0.868	D	1.095	F
	PM	0.801	D	1.005	F
8. Olympic Boulevard & Arlington/Wilton Place	AM	0.799	C	1.111	F
	PM	0.867	D	1.071	F
9. Olympic Boulevard & Western Avenue	AM	0.789	C	1.195	F
	PM	0.748	C	1.152	F
10. La Brea Avenue & San Vicente Boulevard	AM	0.968	E	0.959	E
	PM	0.895	D	0.897	D
11. Pico Boulevard & La Brea Boulevard	AM	0.834	D	1.005	F
	PM	0.882	D	0.979	E
12. Pico Boulevard & San Vicente Boulevard	AM	0.720	C	0.833	D
	PM	0.652	B	0.781	C
13. Pico Boulevard & Rimpau Boulevard	AM	0.960	E	1.088	F
	PM	0.774	C	0.872	D
14. Pico Boulevard & Mullen Avenue	AM	0.656	B	0.713	C
	PM	0.530	A	0.617	B
15. Pico Boulevard & Muirfield Road[a]	AM	109.7	F	364.8	F
	PM	102.2	F	488.7	F

Table 7-9 (Continued)
Cumulative Base Year 2020 Intersection Level of Service Analysis

Intersection	Peak Hour	Existing		Cumulative Base	
		V/C	LOS	V/C	LOS
16. Pico Boulevard & West Boulevard	AM	0.799	C	1.030	F
	PM	0.693	B	0.842	D
17. Pico Boulevard & Crenshaw Boulevard	AM	0.853	D	1.112	F
	PM	0.803	D	1.042	F
18. Pico Boulevardvd & Arlington Avenue	AM	0.637	B	0.887	D
	PM	0.642	B	0.861	D
19. Pico Boulevard & Western Avenue	AM	0.636	B	0.920	E
	PM	0.644	B	0.900	D
20. Venice Boulevard & La Brea Avenue	AM	0.874	D	0.901	E
	PM	0.924	E	0.960	E
21. Venice Boulevard/Vineyard & San Vicente Boulevard	AM	0.867	D	1.758	F
	PM	0.792	C	1.532	F
22. Venice Boulevard & Crenshaw Boulevard	AM	0.909	E	1.467	F
	PM	1.027	F	1.458	F
23. Olympic Boulevard & Rimpau Boulevard	AM	0.841	D	1.034	F
	PM	0.924	E	1.125	F
24. Olympic Boulevard & Country Club Drive/Lucerne	AM	0.511	A	0.485	A
	PM	0.507	A	0.467	A
25. Olympic Boulevard & Fourth Avenue	AM	0.489	A	0.657	B
	PM	0.479	A	0.627	B
26. Crenshaw Boulevard & Country Club Drive	AM	0.605	B	0.670	B
	PM	0.669	B	0.765	C
27. Pico Boulevard & Norton Avenue	AM	0.663	B	0.903	E
	PM	0.739	C	1.013	F

(a) Intersection controlled by stop-signs on minor street approaches. Indicates delay (in seconds) and LOS for the most constrained movements at the intersection.

A comparison of these results with the existing level of service analysis presented in Section 7.2.1 (the results are also summarized on Table 7-9) indicates that the projected growth in background traffic due to cumulative development throughout the study area and overall regional growth will have a significant impact on peak hour operating conditions, even without the proposed project. The number of intersections operating at LOS E or F during one or both peak hours is projected to increase from nine under existing conditions to 18 under Cumulative Base Year 2020 conditions.

Neighborhood Impacts

A neighborhood impact analysis was also conducted for the project. The purpose of this analysis is to assess the potential intrusion of project-generated traffic into the residential neighborhoods adjacent to the project sites. This analysis was conducted in a manner similar to the traffic impact analysis described, except that a separate study area was identified and a separate criteria for significance was defined. Street segments to be analyzed in the vicinity of each station site were identified by City of Los Angeles Traffic Engineering staff.

Study Area Analyzed

Alternative A (Wilton/Arlington/Pico)

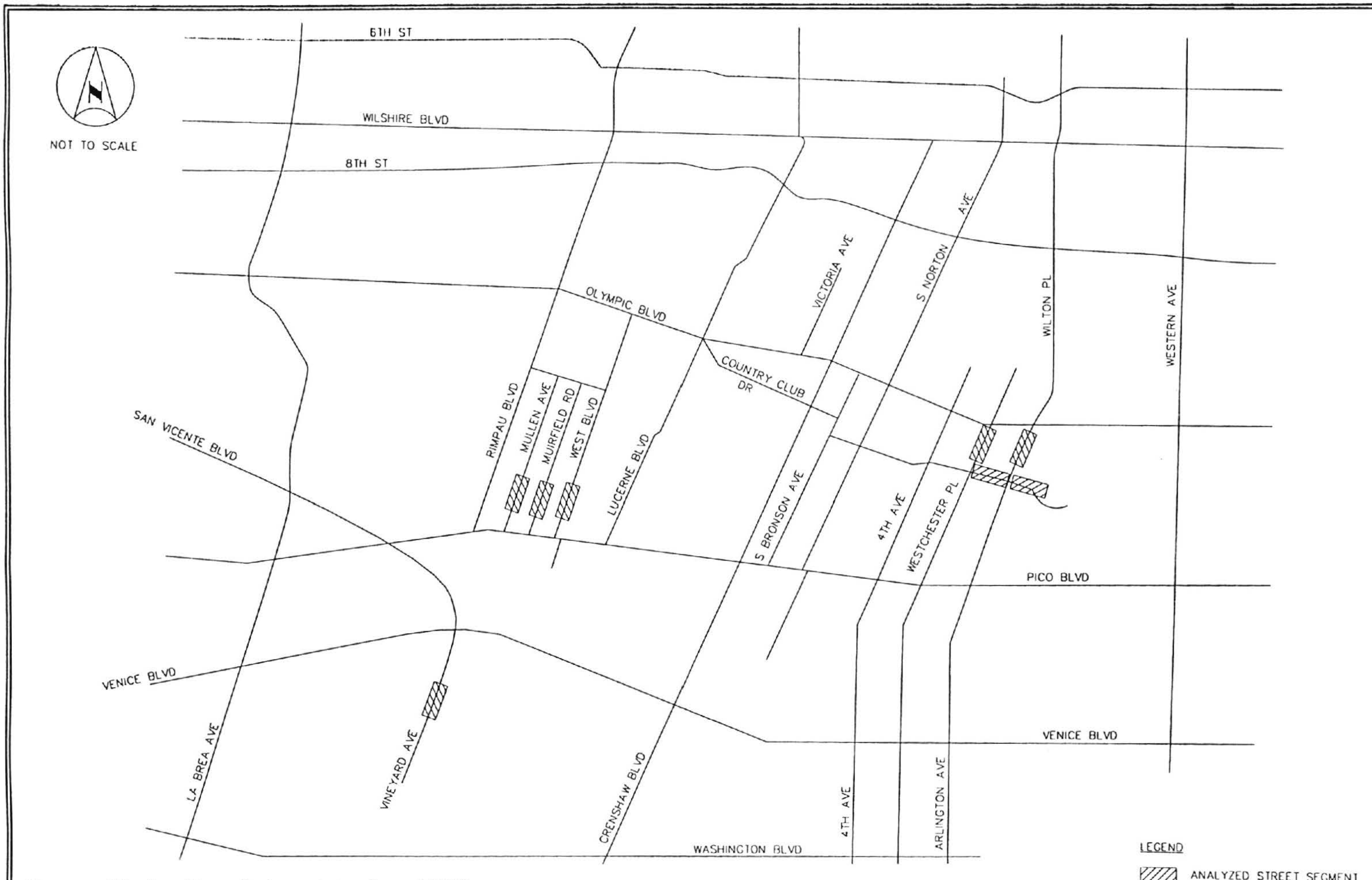
Residential streets adjacent to the stations were included in the study area. As indicated in Figure 7-12, the study area for the residential neighborhood impact analysis includes the following streets:

- Vineyard Avenue south of Venice Boulevard
- Mullen Avenue north of Pico Boulevard
- Muirfield Road north of Pico Boulevard
- West Boulevard north of Pico Boulevard
- Westchester Place, south of Olympic Boulevard
- Country Club Drive, west if Arlington Avenue
- Country Club Drive, east of Arlington Avenue
- Wilton Place, south of Olympic Boulevard

Alternatives B1 and B2 (Wilton/Arlington/Venice)

Residential streets adjacent to the Olympic/Arlington and the Venice/San Vicente stations were included in the study area. As indicated in Figure 7-13, the study area for the residential neighborhood impact analysis includes the following streets:

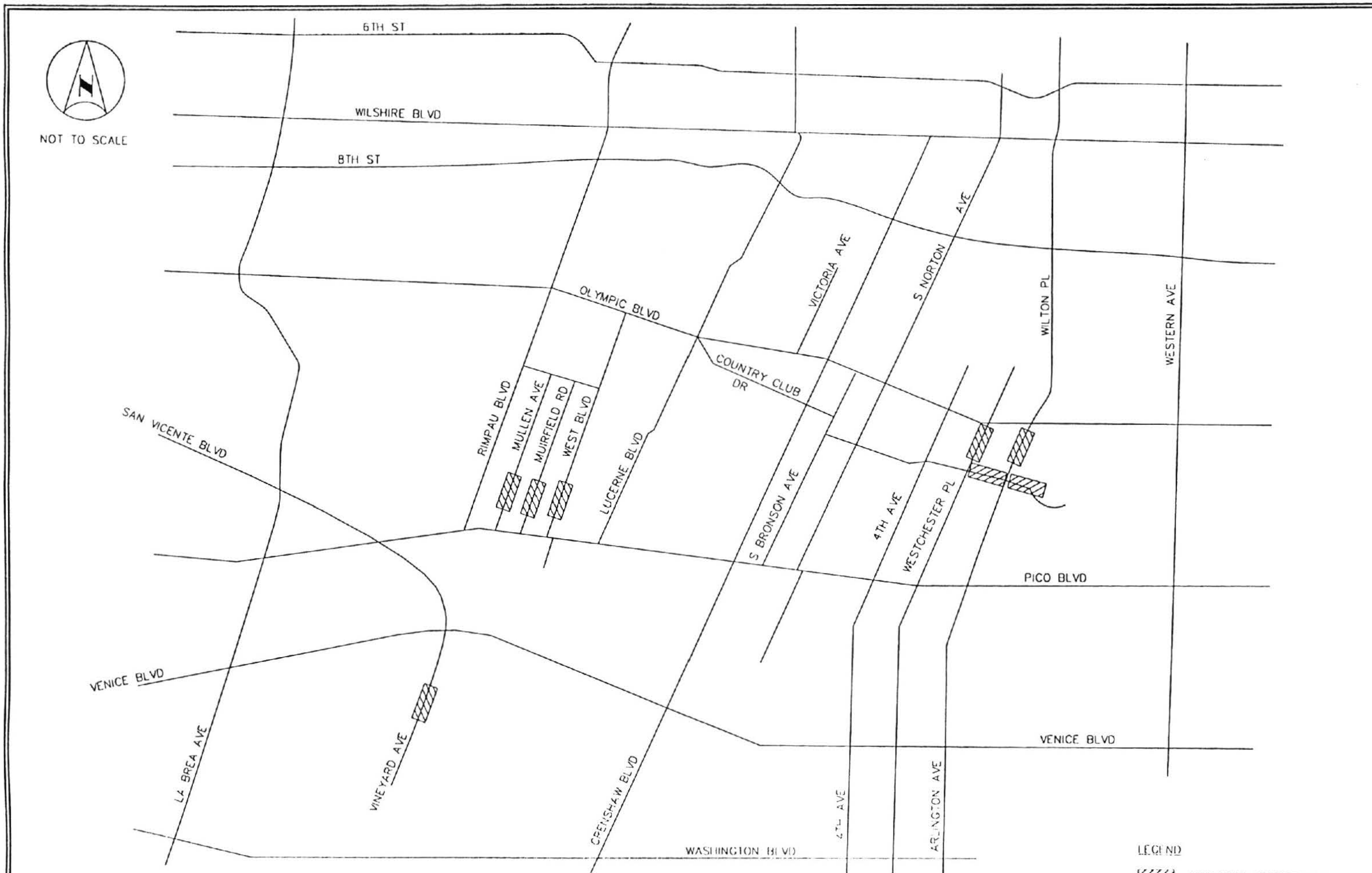
- Vineyard Avenue south of Venice Boulevard
- Mullen Avenue north of Pico Boulevard
- Muirfield Road north of Pico Boulevard
- West Boulevard north of Pico Boulevard
- Westchester Place, south of Olympic Boulevard
- Country Club Drive, west if Arlington Avenue
- Country Club Drive, east of Arlington Avenue
- Wilton Place, south of Olympic Boulevard



(Source: Kimley-Horn & Associates, Inc., 1997)

ULTRASYSTEMS ENVIRONMENTAL INCORPORATED

FIGURE 7-12
LOCATION OF ANALYZED STREET SEGMENTS - ALTERNATIVE A (WILTON/ARLINGTON/PICO)



(Source: Kimley-Horn & Associates, Inc., 1997)

ULTRASYSTEMS ENVIRONMENTAL INCORPORATED

FIGURE 7-13

LOCATION OF ANALYZED STREET SEGMENTS - ALTERNATIVES B1 & B2 (WILTON/ARLINGTON/VENICE)

Alternative C (Crenshaw/Pico)

Residential streets adjacent to the Crenshaw/Olympic and the Pico/San Vicente stations were included in the study area. As indicated in Figure 7-14, the study area for the residential neighborhood impact analysis includes the following streets:

- Vineyard Avenue south of Venice Boulevard
- Mullen Avenue north of Pico Boulevard
- Muirfield Road north of Pico Boulevard
- West Boulevard north of Pico Boulevard
- Victoria Avenue north of Olympic Boulevard
- Bronson Avenue south of Country Club Drive

Traffic Impact Analysis

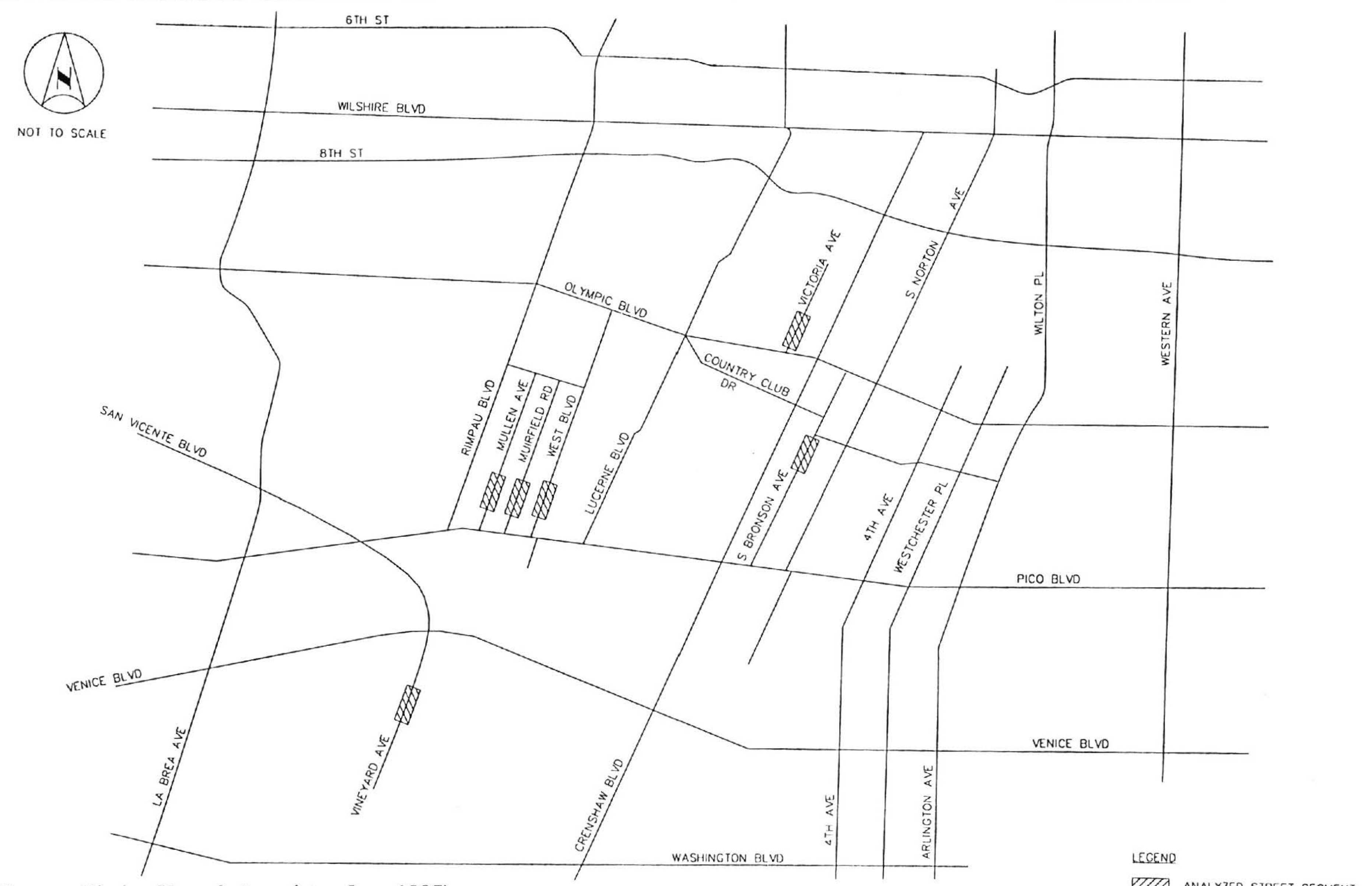
Traffic volumes from the Year 2020 Cumulative Plus Project forecasts were used to assess the potential impact of the project traffic on the residential streets in the study area. Tables 7-10 (Alternative A), 7-11 (Alternatives B1 and B2), and 7-12 (Alternative C) provide a summary of the average daily traffic on each of the residential streets in the study area for the following conditions:

- Existing conditions
- Future Year 2020 Cumulative Base conditions
- Project generated traffic
- Future year 2020 Cumulative Plus Project conditions

Tables 7-10 (Alternative A), 7-11 (Alternatives B1 and B2), and 7-12 (Alternative C) also indicate the percent increase in total future traffic caused by the project and identify the potential locations that would be significantly impacted by the project. As noted in the tables, none of the residential neighborhood streets are expected to be significantly impacted by the proposed project.

7.2.3 Cumulative Impacts

The projected Cumulative Plus Project peak hour traffic volumes were analyzed for two distinct "With Project" traffic conditions: Project Construction and Project Operations. The results identify the potential impacts of the proposed Mid-City extension of the Metro Red Line, and are summarized below.



(Source: Kimley-Horn & Associates, Inc., 1997)

ULTRASYSTEMS
ENVIRONMENTAL
INCORPORATED

FIGURE 7-14
LOCATION OF ANALYZED STREET SEGMENTS - ALTERNATIVE C (CRENSHAW/PICO)

Table 7-10
Neighborhood Street Analysis - Alternative A

Street Segment	Average Daily Traffic				Percent Increase	Significant Impact
	Existing	Cumulative Base	Project Only	Cumulative Plus Project		
Vineyard Avenue s/o Venice Blvd.	470	530	65	595	11%	NO
Mullen Avenue n/o Pico Boulevard	2,000	2,360	75	2,435		NO
Muirfield Road n/o Pico Boulevard	1,300	1,530	75	1,605	4%	NO
West Boulevard n/o Pico Boulevard	3,300	4,190	75	4,265	2%	NO
Westchester Place s/o Olympic Blvd.	950	1,120	25	1,145	2%	NO
Country Club Dr w/o Arlington Ave.	1,780	2,100	25	2,125	1%	NO
Country Club Dr. e/o Arlington Ave.	1,360	1,600	25	1,625	2%	NO
Wilton Place s/o Olympic Boulevard	910	1,070	25	1,095	2%	NO

Table 7-11
Neighborhood Street Analysis - Alternative B

Street Segment	Average Daily Traffic				Percent Increase	Significant Impact
	Existing	Cumulative Base	Project Only	Cumulative Plus Project		
Vineyard Avenue s/o Venice Blvd.	470	530	65	595	11%	NO
Mullen Avenue n/o Pico Boulevard.	2,000	2,360	75	2,435		NO
Muirfield Road n/o Pico Boulevard.	1,300	1,530	75	1,605	4%	NO
West Boulevard n/o Pico Boulevard.	3,300	4,190	75	4,265	2%	NO
Westchester Place s/o Olympic Blvd.	950	1,120	25	1,145	2%	NO
Country Club Dr w/o Arlington Ave.	1,780	2,100	25	2,125	1%	NO
Country Club Dr e/o Arlington Ave.	1,360	1,600	25	1,625	2%	NO
Wilton Place s/o Olympic Blvd.	910	1,070	25	1,095	2%	NO

Table 7-12
Neighborhood Street Analysis - Alternative C

Street Segment	Average Daily Traffic				Percent Increase	Significant Impact
	Existing	Cumulative Base	Project Only	Cumulative Plus Project		
Vineyard Avenue s/o Venice Blvd.	470	530	65	595	11%	NO
Mullen Avenue n/o Pico Blvd.	2,000	2,360	75	2,435	3%	NO
Muirfield Road n/o Pico Blvd.	1,300	1,530	75	1,605	5%	NO
West Boulevard n/o Pico Blvd.	3,300	4,190	75	4,265	2%	NO
Victoria Avenue n/o Olympic Blvd.	570	670	10	680	2%	NO
Bronson Ave. s/o Country Club Dr.	2,550	3,010	10	3,020	1%	NO

7.2.3.1 Construction Impacts

Project Construction Period

The primary impact of the proposed project would be the diversion of traffic from specific routes as a result of the closure of one or more lanes of traffic for construction activities.

Construction Impacts Associated with Alternative A

The peak hour traffic volumes associated with Alternative A were assessed to determine the potential construction-related impacts associated with this scenario, and the results are summarized on Table 7-13. As shown on Table 7-13, a total of 19 intersections are projected to operate at LOS E or F during one or both of the peak hours under this construction scenario. Note that some of the intersections are projected to operate at better levels of service under this scenario when compared to the Cumulative Base condition. This would be the result of the diversion of traffic from one street to another to avoid the construction areas. Construction of Alternative A would have a significant impact at seven of the analyzed intersections. These locations are:

- Wilshire Boulevard and Wilton Place
- Wilshire Boulevard and Western Avenue
- Arlington Avenue and Olympic Boulevard
- Pico Boulevard and La Brea Boulevard
- Pico Boulevard and Rimpau Boulevard
- Pico Boulevard and Arlington Avenue
- Olympic Boulevard and Rimpau Boulevard

Construction Impacts Associated with Alternative B

The peak hour traffic volumes associated with Construction of Alternative B were assessed to determine the potential construction-related impacts associated with this scenario, and the results are summarized on Table 7-14. As shown on Table 7-14, a total of 19 intersections are projected to operate at LOS E or F during one or both of the peak hours under this construction scenario.

Construction of Alternative B would have a significant impact at seven of the analyzed intersections. These locations are:

Table 7-13
Year 2020 Intersection Level of Service Analysis - Alternative A Construction Impacts

	Intersection	Peak Hour	Existing		Cumulative Base		Cumulative + Project		Project Increase in V/C	Significant Project Impact
			V/C	LOS	V/C	LOS	V/C	LOS		
1.	Wilshire Bl & Crenshaw Bl	AM	0.861	D	1.024	F	0.804	D	-0.220	NO
		PM	0.869	D	1.015	F	0.808	D	-0.207	NO
2.	Wilshire Bl & Wilton Pl	AM	0.774	C	1.101	F	1.152	F	0.051	YES
		PM	0.707	C	1.014	F	1.085	F	0.071	YES
3.	Wilshire Bl & Western Ave	AM	0.591	A	0.729	C	0.738	C	0.009	NO
		PM	0.768	C	0.899	D	0.919	E	0.020	YES
4.	8th St & Crenshaw Bl	AM	0.629	B	0.766	C	0.621	B	-0.145	NO
		PM	0.670	B	0.810	D	0.653	B	-0.157	NO
5.	8th St & Arlington/Wilton Pl	AM	0.936	E	1.228	F	1.228	F	0.000	NO
		PM	1.049	F	1.326	F	1.326	F	0.000	NO
6.	8th St & Western Ave	AM	0.695	B	0.874	D	0.874	D	0.000	NO
		PM	0.971	E	1.183	F	1.183	F	0.000	NO
7.	Olympic Bl & Crenshaw Bl	AM	0.868	D	1.095	F	0.983	E	-0.112	NO
		PM	0.801	D	1.005	F	0.968	E	-0.037	NO
8.	Olympic Bl & Arlington/Wilton Pl	AM	0.799	C	1.111	F	1.197	F	0.086	YES
		PM	0.867	D	1.071	F	1.132	F	0.061	YES
9.	Olympic Bl & Western Ave	AM	0.789	C	1.195	F	1.195	F	0.000	NO
		PM	0.748	C	1.152	F	1.160	F	0.008	NO
10.	La Brea Ave & San Vicente Bl	AM	0.968	E	0.959	E	0.960	E	0.001	NO
		PM	0.895	D	0.897	D	0.906	E	0.009	NO
11.	Pico Bl & La Brea Bl	AM	0.834	D	1.005	F	1.042	F	0.037	YES
		PM	0.882	D	0.979	E	1.010	F	0.031	YES
12.	Pico Bl & San Vicente Bl	AM	0.720	C	0.833	D	0.749	C	-0.084	NO
		PM	0.652	B	0.781	C	0.696	B	-0.085	NO
13.	Pico Bl & Rimpau Bl	AM	0.960	E	1.088	F	1.133	F	0.045	YES
		PM	0.774	C	0.872	D	0.935	E	0.063	YES
14.	Pico Bl & Mullen Ave	AM	0.656	B	0.713	C	0.706	C	-0.007	NO
		PM	0.530	A	0.617	B	0.594	A	-0.023	NO
15.	Pico Bl & Muirfield Rd [(a)]	AM	109.7	F	364.8	F	285.7	F	-79.100	NO
		PM	102.2	F	488.7	F	391.8	F	-96.900	NO
16.	Pico Bl & West Bl	AM	0.799	C	1.030	F	1.024	F	-0.006	NO
		PM	0.693	B	0.842	D	0.820	D	-0.022	NO
17.	Pico Bl & Crenshaw Bl	AM	0.853	D	1.112	F	1.072	F	-0.040	NO
		PM	0.803	D	1.042	F	1.030	F	-0.012	NO
18.	Pico Blvd & Arlington Ave	AM	0.637	B	0.887	D	0.921	E	0.034	YES
		PM	0.642	B	0.861	D	0.866	D	0.005	NO
19.	Pico Bl & Western Ave	AM	0.636	B	0.920	E	0.876	D	-0.044	NO
		PM	0.644	B	0.900	D	0.887	D	-0.013	NO
20.	Venice Bl & La Brea Ave	AM	0.874	D	0.901	E	0.895	D	-0.006	NO
		PM	0.924	E	0.960	E	0.964	E	0.004	NO
21.	Venice Bl/Vineyard & San Vicente Bl	AM	0.867	D	1.758	F	1.617	F	-0.141	NO
		PM	0.792	C	1.532	F	1.407	F	-0.125	NO
22.	Venice Bl & Crenshaw Bl	AM	0.909	E	1.467	F	1.295	F	-0.172	NO
		PM	1.027	F	1.458	F	1.326	F	-0.132	NO
23.	Olympic Bl & Rimpau Bl	AM	0.841	D	1.034	F	1.128	F	0.094	YES
		PM	0.924	E	1.125	F	1.217	F	0.092	YES
24.	Olympic Bl & Country Club Dr/Lucerne	AM	0.511	A	0.485	A	0.522	A	0.037	NO
		PM	0.507	A	0.467	A	0.501	A	0.034	NO
25.	Olympic Bl & Fourth Ave	AM	0.489	A	0.657	B	0.680	B	0.023	NO
		PM	0.479	A	0.627	B	0.640	B	0.013	NO
26.	Crenshaw Bl & Country Club Dr	AM	0.605	B	0.670	B	0.552	A	-0.118	NO
		PM	0.669	B	0.765	C	0.668	B	-0.097	NO
27.	Pico Bl & Norton Ave	AM	0.663	B	0.903	E	0.836	D	-0.067	NO
		PM	0.739	C	1.013	F	0.936	E	-0.077	NO

(a) Intersection controlled by stop-signs on minor street approaches. Indicates delay (in seconds) and LOS for the most constrained movements at the intersection.

- Wilshire Boulevard and Wilton Place
- Wilshire Boulevard and Western Avenue
- Arlington Avenue and Olympic Boulevard
- Pico Boulevard and La Brea Boulevard
- Pico Boulevard and Rimpau Boulevard
- Pico Boulevard and Arlington Avenue
- Olympic Boulevard and Rimpau Boulevard

Construction Impacts Associated with Alternative C

The peak hour traffic volumes associated with construction of Alternative C were assessed to determine the potential construction-related impacts associated with this scenario, and the results are summarized on Table 7-15. As shown on Table 7-15, a total of 19 intersections are projected to operate at LOS E or F during one or both of the peak hours under this construction scenario.

Construction of Alternative C would have a significant impact at seven of the analyzed intersections. These locations are:

- Wilshire Boulevard and Wilton Place
- Wilshire Boulevard and Western Avenue
- Arlington Avenue and Olympic Boulevard
- Pico Boulevard and La Brea Boulevard
- Pico Boulevard and Rimpau Boulevard
- Pico Boulevard and Muirfield Road
- Pico Boulevard and Arlington Avenue
- Olympic Boulevard and Rimpau Boulevard

Project Operations

Alternative A - Wilton/Arlington/Pico Alignment

The Cumulative Plus Project peak hour traffic volumes associated with project operations were assessed to determine the potential project-related impacts associated with the operation of the Wilton/Arlington Mid-City Segment Alignment of the Metro Red Line -- Alternative A. The results are summarized in Table 7-16, which shows that a total of 21 intersections are projected to operate at LOS E or F during one or both of the peak hours under Alternative A.

Based on the level of service (LOS) criteria established for this study,[1] the Project Alternative A would have a significant impact at 9 of the 27 analyzed intersections during Project Operations. These locations are:

- La Brea Avenue & San Vicente Boulevard
- La Brea Avenue & Pico Boulevard
- San Vicente Boulevard & Pico Boulevard
- Pico Boulevard & Rimpau Boulevard
- West Boulevard & Pico Boulevard
- Crenshaw Boulevard & Pico Boulevard
- Pico Boulevard & Arlington Avenue
- Pico Boulevard & Western Avenue
- Pico Boulevard & Norton Avenue

1/ An increase in volume-to-capacity ratio of 0.02 or greater at locations operating at level of service E or F.

Table 7-16
Year 2020 Intersection Level of Service Analysis - Operational Scenario (Alternative A)

Intersection	Peak Hour	Existing V/C	Existing LOS	Cumulative Base V/C	Cumulative Base LOS	Cumulative + Project V/C	Cumulative + Project LOS	Project Increase in V/C	Significant Project Impact	With Mitigation	Project Increase In V/C	Residual Impact
1. Wilshire Boulevard& Crenshaw Boulevard	AM	0.861	D	1.024	F	1.028	F	0.004	NO	NA	0.004	NO
	PM	0.869	D	1.015	F	1.017	F	0.002	NO	NA	0.002	NO
2. Wilshire Boulevard & Wilton Place	AM	0.774	C	1.101	F	1.112	F	0.011	NO	NA	0.011	NO
	PM	0.707	C	1.014	F	1.018	F	0.004	NO	NA	0.004	NO
3. Wilshire Boulevard & Western Avenue	AM	0.591	A	0.729	C	0.739	C	0.010	NO	NA	0.010	NO
	PM	0.768	C	0.899	D	0.907	E	0.008	NO	NA	0.008	NO
4. 8th St & Crenshaw Boulevard	AM	0.629	B	0.766	C	0.768	C	0.002	NO	NA	0.002	NO
	PM	0.670	B	0.810	D	0.811	D	0.001	NO	NA	0.001	NO
5. 8th St & Arlington/Wilton Place	AM	0.936	E	1.228	F	1.244	F	0.016	NO	NA	0.016	NO
	PM	1.049	F	1.326	F	1.338	F	0.012	NO	NA	0.012	NO
6. 8th St & Western Avenue	AM	0.695	B	0.874	D	0.889	D	0.015	NO	NA	0.015	NO
	PM	0.971	E	1.183	F	1.192	F	0.009	NO	NA	0.009	NO
7. Olympic Boulevard & Crenshaw Boulevard	AM	0.868	D	1.095	F	1.100	F	0.005	NO	NA	0.005	NO
	PM	0.801	D	1.005	F	1.008	F	0.003	NO	NA	0.003	NO
8. Olympic Boulevard & Arlington/Wilton Place	AM	0.799	C	1.111	F	1.121	F	0.010	NO	NA	0.010	NO
	PM	0.867	D	1.071	F	1.080	F	0.009	NO	NA	0.009	NO
9. Olympic Boulevard & Western Avenue	AM	0.789	C	1.195	F	1.205	F	0.010	NO	NA	0.010	NO
	PM	0.748	C	1.152	F	1.162	F	0.010	NO	NA	0.010	NO
10. La Brea Avenue & San Vicente Boulevard	AM	0.968	E	0.959	E	0.974	E	0.015	NO	NA	0.015	NO
	PM	0.895	D	0.897	D	0.917	E	0.020	YES	0.896 D	-0.001	NO
11. Pico Boulevard & La Brea Boulevard	AM	0.834	D	1.005	F	1.026	F	0.021	YES	0.924 E	-0.081	NO
	PM	0.882	D	0.979	E	0.992	E	0.013	NO	NA	0.013	NO
12. Pico Boulevard & San Vicente Boulevard	AM	0.720	C	0.833	D	0.917	E	0.084	YES	0.818 D	-0.015	NO
	PM	0.652	B	0.781	C	0.825	D	0.044	YES	NA	0.044	NO
13. Pico Boulevard & Rimpau Boulevard	AM	0.960	E	1.088	F	1.130	F	0.042	YES	0.980 E	-0.108	NO
	PM	0.774	C	0.872	D	0.916	E	0.044	YES	0.722 C	-0.150	NO
14. Pico Boulevard & Mullen Avenue	AM	0.656	B	0.713	C	0.752	C	0.039	NO	NA	0.039	NO
	PM	0.530	A	0.617	B	0.651	B	0.034	NO	NA	0.034	NO
15. Pico Boulevard & Muirfield Road [a]	AM	109.7	F	364.8	F	0.657	B	NA	NO	NA	NA	NO
	PM	102.2	F	488.7	F	0.610	B	NA	NO	NA	NA	NO
16. Pico Boulevard & West Boulevard	AM	0.799	C	1.030	F	1.055	F	0.025	YES	0.974 E	-0.056	NO
	PM	0.693	B	0.842	D	0.856	D	0.014	NO	NA	0.014	NO

Table 7-16 (Continued)
Year 2020 Intersection Level of Service Analysis - Operational Scenario (Alternative A)

	Intersection	Peak Hour	Existing V/C	Existing LOS	Cumulative Base V/C	Cumulative Base LOS	Cumulative + Project V/C	Cumulative + Project LOS	Project Increase in V/C	Significant Project Impact	With Mitigation		Project Increase In V/C	Residual Impact
17.	Pico Boulevard & Crenshaw Boulevard	AM	0.853	D	1.112	F	1.139	F	0.027	YES	1.128	F	0.016	NO
		PM	0.803	D	1.042	F	1.052	F	0.010	NO	NA		0.010	NO
18.	Pico Boulevard & Arlington Avenue	AM	0.637	B	0.887	D	0.913	E	0.026	YES	0.888	D	0.001	NO
		PM	0.642	B	0.861	D	0.870	D	0.009	NO	NA		0.009	NO
19.	Pico Boulevard & Western Avenue	AM	0.636	B	0.920	E	0.935	E	0.015	NO	NA		0.015	NO
		PM	0.644	B	0.900	D	0.922	E	0.022	YES	0.906	E	0.006	NO
20.	Venice Boulevard & La Brea Avenue	AM	0.874	D	0.901	E	0.918	E	0.017	NO	NA		0.017	NO
		PM	0.924	E	0.960	E	0.970	E	0.010	NO	NA		0.010	NO
21.	Venice Boulevard/Vineyard & San Vicente Boulevard	AM	0.867	D	1.758	F	1.765	F	0.007	NO	NA		0.007	NO
		PM	0.792	C	1.532	F	1.538	F	0.006	NO	NA		0.006	NO
22.	Venice Boulevard & Crenshaw Boulevard	AM	0.909	E	1.467	F	1.466	F	-0.001	NO	NA		-0.001	NO
		PM	1.027	F	1.458	F	1.451	F	-0.007	NO	NA		-0.007	NO
23.	Olympic Boulevard & Rimpau Boulevard	AM	0.841	D	1.034	F	1.038	F	0.004	NO	NA		0.004	NO
		PM	0.924	E	1.125	F	1.124	F	-0.001	NO	NA		-0.001	NO
24.	Olympic Boulevard & Country Club Drive/Lucerne	AM	0.511	A	0.485	A	0.486	A	0.001	NO	NA		0.001	NO
		PM	0.507	A	0.467	A	0.467	A	0.000	NO	NA		0.000	NO
25.	Olympic Boulevard & Fourth Avenue	AM	0.489	A	0.657	B	0.663	B	0.006	NO	NA		0.006	NO
		PM	0.479	A	0.627	B	0.629	B	0.002	NO	NA		0.002	NO
26.	Crenshaw Boulevard & Country Club Drive	AM	0.605	B	0.670	B	0.661	B	-0.009	NO	NA		-0.009	NO
		PM	0.669	B	0.765	C	0.765	C	0.000	NO	NA		0.000	NO
27.	Pico Boulevard & Norton Avenue	AM	0.663	B	0.903	E	0.941	E	0.038	YES	0.555	A	-0.348	NO
		PM	0.739	C	1.013	F	1.036	F	0.023	YES	0.571	A	-0.442	NO

(a) Intersection controlled by stop-signs on minor street approaches. Indicates delay (in seconds) and LOS for the most constrained movements at the intersection.

Alternatives B1 and B2 - Wilton/Arlington/Venice Alignment

The Cumulative Plus Project peak hour traffic volumes associated with project operations were assessed to determine the potential project-related impacts associated with the operation of the Wilton/Arlington Mid-City Segment Alignment of the Metro Red Line -- Alternatives B1 and B2. The results are summarized in Table 7-17, which shows that a total of 21 intersections are projected to operate at LOS E or F during one or both of the peak hours under Alternative B.

Based on the level of service (LOS) criteria established for this study, the Project Alternatives B1 and B2 would have a significant impact at the same 9 ~~of the 27 analyzed~~ intersections identified above for Alternative A~~ during Project Operations~~. ~~These locations are:~~

- ~~La Brea Avenue & San Vicente Boulevard~~
- ~~La Brea Avenue & Pico Boulevard~~
- ~~San Vicente Boulevard & Pico Boulevard~~
- ~~Pico Boulevard & Rimpau Boulevard~~
- ~~West Boulevard & Pico Boulevard~~
- ~~Crenshaw Boulevard & Pico Boulevard~~
- ~~Pico Boulevard & Arlington Avenue~~
- ~~Pico Boulevard & Western Avenue~~
- ~~Pico Boulevard & Norton Avenue~~

Alternative C - Crenshaw/Pico Alignment

The Cumulative Plus Project peak hour traffic volumes associated with project operations were assessed to determine the potential project-related impacts associated with the operation of the Crenshaw Mid-City Segment alignment of the Metro Red Line (Alternative C). The results are summarized in Table 7-18, which shows that a total of 21 intersections are projected to operate at LOS E or F during one or both of the peak hours under Alternative C.

Based on the level of service (LOS) criteria established for this study, the Project Alternative C would have a significant impact at the same 9 ~~of the 27 analyzed~~ intersections identified above for Alternative A~~ during Project Operations~~. ~~These locations are:~~

- ~~La Brea Avenue & San Vicente Boulevard~~
- ~~La Brea Avenue & Pico Boulevard~~
- ~~San Vicente Boulevard & Pico Boulevard~~
- ~~Pico Boulevard & Rimpau Boulevard~~
- ~~West Boulevard & Pico Boulevard~~
- ~~Crenshaw Boulevard & Pico Boulevard~~
- ~~Pico Boulevard & Arlington Avenue~~
- ~~Pico Boulevard & Western Avenue~~
- ~~Pico Boulevard & Norton Avenue~~

Table 7-17
Year 2020 Intersection Level of Service Analysis - Operational Scenario (Alternative B)

Intersection	Peak Hour	Existing		Cumulative Base		Cumulative + Project		Project Increase in V/C	Significant Project Impact	With Mitigation	Project Increase In V/C	Residual Impact
		V/C	LOS	V/C	LOS	V/C	LOS					
1. Wilshire Boulevard& Crenshaw Boulevard	AM	0.861	D	1.024	F	1.028	F	0.004	NO	NA	0.004	NO
	PM	0.869	D	1.015	F	1.017	F	0.002	NO	NA	0.002	NO
2. Wilshire Boulevard & Wilton Place	AM	0.774	C	1.101	F	1.112	F	0.011	NO	NA	0.011	NO
	PM	0.707	C	1.014	F	1.018	F	0.004	NO	NA	0.004	NO
3. Wilshire Boulevard & Western Avenue	AM	0.591	A	0.729	C	0.739	C	0.010	NO	NA	0.010	NO
	PM	0.768	C	0.899	D	0.907	E	0.008	NO	NA	0.008	NO
4. 8th St & Crenshaw Boulevard	AM	0.629	B	0.766	C	0.768	C	0.002	NO	NA	0.002	NO
	PM	0.670	B	0.810	D	0.811	D	0.001	NO	NA	0.001	NO
5. 8th St & Arlington/Wilton Place	AM	0.936	E	1.228	F	1.244	F	0.016	NO	NA	0.016	NO
	PM	1.049	F	1.326	F	1.338	F	0.012	NO	NA	0.012	NO
6. 8th St & Western Avenue	AM	0.695	B	0.874	D	0.889	D	0.015	NO	NA	0.015	NO
	PM	0.971	E	1.183	F	1.192	F	0.009	NO	NA	0.009	NO
7. Olympic Boulevard & Crenshaw Boulevard	AM	0.868	D	1.095	F	1.100	F	0.005	NO	NA	0.005	NO
	PM	0.801	D	1.005	F	1.008	F	0.003	NO	NA	0.003	NO
8. Olympic Boulevard & Arlington/Wilton Place	AM	0.799	C	1.111	F	1.121	F	0.010	NO	NA	0.010	NO
	PM	0.867	D	1.071	F	1.080	F	0.009	NO	NA	0.009	NO
9. Olympic Boulevard & Western Avenue	AM	0.789	C	1.195	F	1.205	F	0.010	NO	NA	0.010	NO
	PM	0.748	C	1.152	F	1.162	F	0.010	NO	NA	0.010	NO
10. La Brea Avenue & San Vicente Boulevard	AM	0.968	E	0.959	E	0.974	E	0.015	NO	NA	0.015	NO
	PM	0.895	D	0.897	D	0.917	E	0.020	YES	0.896 D	-0.001	NO
11. Pico Boulevard & La Brea Boulevard	AM	0.834	D	1.005	F	1.026	F	0.021	YES	0.924 E	-0.081	NO
	PM	0.882	D	0.979	E	0.992	E	0.013	NO	NA	0.013	NO
12. Pico Boulevard & San Vicente Boulevard	AM	0.720	C	0.833	D	0.917	E	0.084	YES	0.818 D	-0.015	NO
	PM	0.652	B	0.781	C	0.825	D	0.044	YES	NA	0.044	NO
13. Pico Boulevard & Rimpau Boulevard	AM	0.960	E	1.088	F	1.130	F	0.042	YES	0.980 E	-0.108	NO
	PM	0.774	C	0.872	D	0.916	E	0.044	YES	0.722 C	-0.150	NO
14. Pico Boulevard & Mullen Avenue	AM	0.656	B	0.713	C	0.752	C	0.039	NO	NA	0.039	NO
	PM	0.530	A	0.617	B	0.651	B	0.034	NO	NA	0.034	NO
15. Pico Boulevard & Muirfield Road [(a)]	AM	109.7	F	364.8	F	0.657	B	NA	NO	NA	NA	NO
	PM	102.2	F	488.7	F	0.610	B	NA	NO	NA	NA	NO
16. Pico Boulevard & West Boulevard	AM	0.799	C	1.030	F	1.055	F	0.025	YES	0.974 E	-0.056	NO
	PM	0.693	B	0.842	D	0.856	D	0.014	NO	NA	0.014	NO

Table 7-17 (Continued)
Year 2020 Intersection Level of Service Analysis - Operational Scenario (Alternative B)

Intersection	Peak Hour	Existing		Cumulative Base		Cumulative + Project		Project Increase in V/C	Significant Project Impact	With Mitigation	Project Increase In V/C	Residual Impact
		V/C	LOS	V/C	LOS	V/C	LOS					
17. Pico Boulevard & Crenshaw Boulevard	AM	0.853	D	1.112	F	1.139	F	0.027	YES	1.128 F	0.016	NO
	PM	0.803	D	1.042	F	1.052	F	0.010	NO	NA	0.010	NO
18. Pico Boulevard & Arlington Avenue	AM	0.637	B	0.887	D	0.913	E	0.026	YES	0.888 D	0.001	NO
	PM	0.642	B	0.861	D	0.870	D	0.009	NO	NA	0.009	NO
19. Pico Boulevard & Western Avenue	AM	0.636	B	0.920	E	0.935	E	0.015	NO	NA	0.015	NO
	PM	0.644	B	0.900	D	0.922	E	0.022	YES	0.906 E	0.006	NO
20. Venice Boulevard & La Brea Avenue	AM	0.874	D	0.901	E	0.918	E	0.017	NO	NA	0.017	NO
	PM	0.924	E	0.960	E	0.970	E	0.010	NO	NA	0.010	NO
21. Venice Boulevard/Vineyard & San Vicente Boulevard	AM	0.867	D	1.758	F	1.765	F	0.007	NO	NA	0.007	NO
	PM	0.792	C	1.532	F	1.538	F	0.006	NO	NA	0.006	NO
22. Venice Boulevard & Crenshaw Boulevard	AM	0.909	E	1.467	F	1.466	F	-0.001	NO	NA	-0.001	NO
	PM	1.027	F	1.458	F	1.451	F	-0.007	NO	NA	-0.007	NO
23. Olympic Boulevard & Rimpau Boulevard	AM	0.841	D	1.034	F	1.038	F	0.004	NO	NA	0.004	NO
	PM	0.924	E	1.125	F	1.124	F	-0.001	NO	NA	-0.001	NO
24. Olympic Boulevard & Country Club Drive/Lucerne	AM	0.511	A	0.485	A	0.486	A	0.001	NO	NA	0.001	NO
	PM	0.507	A	0.467	A	0.467	A	0.000	NO	NA	0.000	NO
25. Olympic Boulevard & Fourth Avenue	AM	0.489	A	0.657	B	0.663	B	0.006	NO	NA	0.006	NO
	PM	0.479	A	0.627	B	0.629	B	0.002	NO	NA	0.002	NO
26. Crenshaw Boulevard & Country Club Drive	AM	0.605	B	0.670	B	0.661	B	-0.009	NO	NA	-0.009	NO
	PM	0.669	B	0.765	C	0.765	C	0.000	NO	NA	0.000	NO
27. Pico Boulevard & Norton Avenue	AM	0.663	B	0.903	E	0.941	E	0.038	YES	0.555 A	-0.348	NO
	PM	0.739	C	1.013	F	1.036	F	0.023	YES	0.571 A	-0.442	NO

(a) Intersection controlled by stop-signs on minor street approaches. Indicates delay (in seconds) and LOS for the most constrained movements at the intersection.

Table 7-18
Year 2020 Intersection Level of Service Analysis - Operational Scenario (Alternative C)

Intersection	Peak Hour	Existing V/C	Existing LOS	Cumulative Base V/C	Cumulative Base LOS	Cumulative + Project V/C	Cumulative + Project LOS	Project Increase in V/C	Significant Project Impact	With Mitigation	Project Increase In V/C	Residual Impact
1. Wilshire Boulevard & Crenshaw Boulevard	AM	0.861	D	1.024	F	1.041	F	0.017	NO	NA	0.017	NO
	PM	0.869	D	1.015	F	1.026	F	0.011	NO	NA	0.011	NO
2. Wilshire Boulevard & Wilton Place	AM	0.774	C	1.101	F	1.114	F	0.013	NO	NA	0.013	NO
	PM	0.707	C	1.014	F	1.022	F	0.008	NO	NA	0.008	NO
3. Wilshire Boulevard & Western Avenue	AM	0.591	A	0.729	C	0.738	C	0.009	NO	NA	0.009	NO
	PM	0.768	C	0.899	D	0.910	E	0.011	NO	NA	0.011	NO
4. 8th St & Crenshaw Boulevard	AM	0.629	B	0.766	C	0.772	C	0.006	NO	NA	0.006	NO
	PM	0.670	B	0.810	D	0.815	D	0.005	NO	NA	0.005	NO
5. 8th St & Arlington/Wilton Place	AM	0.936	E	1.228	F	1.240	F	0.012	NO	NA	0.012	NO
	PM	1.049	F	1.326	F	1.335	F	0.009	NO	NA	0.009	NO
6. 8th St & Western Avenue	AM	0.695	B	0.874	D	0.887	D	0.013	NO	NA	0.013	NO
	PM	0.971	E	1.183	F	1.191	F	0.008	NO	NA	0.008	NO
7. Olympic Boulevard & Crenshaw Boulevard	AM	0.868	D	1.095	F	1.104	F	0.009	NO	NA	0.009	NO
	PM	0.801	D	1.005	F	1.011	F	0.006	NO	NA	0.006	NO
8. Olympic Boulevard & Arlington/Wilton Place	AM	0.799	C	1.111	F	1.118	F	0.007	NO	NA	0.007	NO
	PM	0.867	D	1.071	F	1.078	F	0.007	NO	NA	0.007	NO
9. Olympic Boulevard & Western Avenue	AM	0.789	C	1.195	F	1.204	F	0.009	NO	NA	0.009	NO
	PM	0.748	C	1.152	F	1.161	F	0.009	NO	NA	0.009	NO
10. La Brea Avenue & San Vicente Boulevard	AM	0.968	E	0.959	E	0.973	E	0.014	NO	NA	0.014	NO
	PM	0.895	D	0.897	D	0.917	E	0.020	YES	0.896 D	0.001	NO
11. Pico Boulevard & La Brea Boulevard	AM	0.834	D	1.005	F	1.026	F	0.021	YES	0.925 E	-0.080	NO
	PM	0.882	D	0.979	E	0.992	E	0.013	NO	NA	0.013	NO
12. Pico Boulevard & San Vicente Boulevard	AM	0.720	C	0.833	D	0.912	E	0.079	YES	0.815 D	-0.018	NO
	PM	0.652	B	0.781	C	0.822	D	0.041	NO	NA	0.041	NO
13. Pico Boulevard & Rimpau Boulevard	AM	0.960	E	1.088	F	1.127	F	0.039	YES	0.978 E	-0.110	NO
	PM	0.774	C	0.872	D	0.913	E	0.041	YES	0.763 C	-0.109	NO
14. Pico Boulevard & Mullen Avenue	AM	0.656	B	0.713	C	0.750	C	0.037	NO	NA	0.037	NO
	PM	0.530	A	0.617	B	0.647	B	0.030	NO	NA	0.030	NO
15. Pico Boulevard & Muirfield Road [a]	AM	109.7	F	**	F	**	F	**	NO	NA	0.000	NO
	PM	102.2	F	**	F	**	F	**	NO	NA	0.000	NO
16. Pico Boulevard & West Boulevard	AM	0.799	C	1.030	F	1.053	F	0.023	YES	0.973 E	-0.057	NO
	PM	0.693	B	0.842	D	0.855	D	0.013	NO	NA	0.013	NO

Table 7-18 (Continued)
Year 2020 Intersection Level of Service Analysis - Operational Scenario (Alternative C)

Intersection	Peak Hour	Existing V/C	Existing LOS	Cumulative Base V/C	Cumulative Base LOS	Cumulative + Project V/C	Cumulative + Project LOS	Project Increase in V/C	Significant Project Impact	With Mitigation	Project Increase In V/C	Residual Impact
17. Pico Boulevard & Crenshaw Boulevard	AM	0.853	D	1.112	F	1.139	F	0.027	YES	1.128 F	0.016	NO
	PM	0.803	D	1.042	F	1.053	F	0.011	NO	NA	0.011	NO
18. Pico Boulevard & Arlington Avenue	AM	0.637	B	0.887	D	0.910	E	0.023	YES	0.884 D	-0.003	NO
	PM	0.642	B	0.861	D	0.869	D	0.008	NO	NA	0.008	NO
19. Pico Boulevard & Western Avenue	AM	0.636	B	0.920	E	0.934	E	0.014	NO	NA	0.014	NO
	PM	0.644	B	0.900	D	0.921	E	0.021	YES	0.904 D	0.004	NO
20. Venice Boulevard & La Brea Avenue	AM	0.874	D	0.901	E	0.918	E	0.017	NO	NA	0.017	NO
	PM	0.924	E	0.960	E	0.971	E	0.011	NO	NA	0.011	NO
21. Venice Boulevard/Vineyard & San Vicente Boulevard	AM	0.867	D	1.758	F	1.765	F	0.007	NO	NA	0.007	NO
	PM	0.792	C	1.532	F	1.538	F	0.006	NO	NA	0.006	NO
22. Venice Boulevard & Crenshaw Boulevard	AM	0.909	E	1.467	F	1.465	F	-0.002	NO	NA	-0.002	NO
	PM	1.027	F	1.458	F	1.450	F	-0.008	NO	NA	-0.008	NO
23. Olympic Boulevard & Rimpau Boulevard	AM	0.841	D	1.034	F	1.040	F	0.006	NO	NA	0.006	NO
	PM	0.924	E	1.125	F	1.126	F	0.001	NO	NA	0.001	NO
24. Olympic Boulevard & Country Club Drive/Lucerne	AM	0.511	A	0.485	A	0.487	A	0.002	NO	NA	0.002	NO
	PM	0.507	A	0.467	A	0.469	A	0.002	NO	NA	0.002	NO
25. Olympic Boulevard & Fourth Avenue	AM	0.489	A	0.657	B	0.659	B	0.002	NO	NA	0.002	NO
	PM	0.479	A	0.627	B	0.627	B	0.000	NO	NA	0.000	NO
26. Crenshaw Boulevard & Country Club Drive	AM	0.605	B	0.670	B	0.674	B	0.004	NO	NA	0.004	NO
	PM	0.669	B	0.765	C	0.767	C	0.002	NO	NA	0.002	NO
27. Pico Boulevard & Norton Avenue	AM	0.663	B	0.903	E	0.938	E	0.035	YES	0.555 A	-0.351	NO
	PM	0.739	C	1.013	F	1.032	F	0.019	NO	0.571 A	0.019	NO

(a) Intersection controlled by stop-signs on minor street approaches. Indicates delay (in seconds) and LOS for the most constrained movements at the intersection.
** Over saturated conditions; delay cannot be calculated.

7.2.3.2 Operational Impacts

Traffic Impact Analysis

The cumulative traffic impact analysis was discussed above with the project traffic impacts in Section 7.2.2.2.

7.2.4 Mitigation Measures

Mitigation Measures - Construction Impacts (All Alternatives)

Construction ~~of Alternative A~~ would result in temporary but significant impacts at seven intersections:

- Wilshire Boulevard and Wilton Place
- Wilshire Boulevard and Western Avenue
- Arlington Avenue and Olympic Boulevard
- Pico Boulevard and La Brea Boulevard
- Pico Boulevard and Rimpau Boulevard
- Pico Boulevard and Arlington Avenue
- Olympic Boulevard and Rimpau Boulevard

~~Construction of Alternative B1 or B2 would result in temporary but significant impacts at seven intersections:~~

- ~~Wilshire Boulevard and Wilton Place~~
- ~~Wilshire Boulevard and Western Avenue~~
- ~~Arlington Avenue and Olympic Boulevard~~
- ~~Pico Boulevard and La Brea Boulevard~~
- ~~Pico Boulevard and Rimpau Boulevard~~
- ~~Pico Boulevard and Arlington Avenue~~
- ~~Olympic Boulevard and Rimpau Boulevard~~

~~Construction of Alternative C would result in temporary but significant impacts at seven intersections:~~

- ~~Wilshire Boulevard and Wilton Place~~
- ~~Wilshire Boulevard and Western Avenue~~
- ~~Arlington Avenue and Olympic Boulevard~~
- ~~Pico Boulevard and La Brea Boulevard~~
- ~~Pico Boulevard and Rimpau Boulevard~~
- ~~Pico Boulevard and Arlington Avenue~~
- ~~Olympic Boulevard and Rimpau Boulevard~~

1. Although the Metro Red Line Mid-City Extension project is expected to have significant impacts at several locations during construction of the proposed project, no physical mitigation measures are recommended. The construction-related impacts will be temporary in nature and cannot be clearly defined in terms of specific timing or duration. Therefore, as is standard procedure, the ~~recommended~~ mitigation measure is ~~involve~~ the preparation of construction zone traffic control plans currently subject to approval by the LADD on an as-needed basis. These plans will address the following potential requirements:

    - Detour routes
    - Signing requirements
    - Re-striping plans
    - Truck haul routes
    - Time of day restrictions
    - Proposed schedule

2. In addition, location and access to bus stops and adjacent properties will be maintained by the MTA wherever possible during the entire construction period. If bus stops are relocated, they should be within reasonable walking distances. Sidewalks will be maintained or temporarily replaced, or detours to alternatives paths should be provided. Also, the MTA plans will account for advance notification of temporary parking loss and, where necessary, identification of temporary parking replacement or alternative adjacent parking will be made.

These mitigation measures will be applied, as the site-specific situation warrants, and apply to all construction areas for all alternatives.

Mitigation Measures - For Project Operations

The results of the traffic impact analysis indicates that traffic generated by the proposed project would be expected to have a significant impact at nine intersections for both Alternatives A and B (the Wilton/Arlington Alignment) and Alternative C (the Crenshaw Alignment). Mitigation measures were developed for those locations where it was deemed feasible and cost effective from an engineering perspective.

The improvement program described below was designed to increase the capacity of the roadway system at the specific locations expected to be impacted by the proposed project traffic. The primary emphasis of this activity was to identify physical improvements within the existing roadway section. Improvements involving right-of-way acquisition were typically not considered since the study area is located within a relatively built-up area.

Description of Mitigation Measures

Although the project impacts varied slightly between Alternatives, the same nine intersections were impacted for each of the project alternatives. Each of the mitigation measures shown below are applicable to Alternatives A, B1, B2 and C.

3. La Brea Avenue & San Vicente Boulevard - Cut back the south side of the raised median on San Vicente Boulevard on the eastbound approach, and re-stripe to add a second left-turn lane on the eastbound approach. This will also require removal of one parking space on the eastbound approach.

4. Pico Boulevard & La Brea Avenue - Change the signal phasing to reflect a protected-permitted phase for the eastbound movement. This improvement will mitigate the project-related impacts to a less than significant level.

5. Pico Boulevard & San Vicente Boulevard - Cut back the west side of the raised median on the southbound approach on San Vicente and re-stripe the southbound approach to provide a second left-turn lane. This improvement will mitigate the project-related impacts to a less than significant level.

6. Pico Boulevard & Rimpau Boulevard - Stripe Rimpau Boulevard, currently with 50' curb-to-curb width, to provide for one left-turn lane, one shared left-/right-turn lane, and one right-turn lane for the approach and one lane for the departure. This improvement will mitigate the project-related impacts to a less than significant level.

7. Pico Boulevard & West Boulevard - Re-stripe Pico Boulevard to provide a third westbound through lane. This will be accomplished by re-striping both the eastbound and westbound approaches along Pico Boulevard, currently with 70' curb-to-curb width, resulting in one left-turn lane and two through lanes for the eastbound approach, and one left-turn lane and three through lanes for the westbound approach. This improvement will also require the removal of about six parking spaces on the eastbound approach.

8. Pico Boulevard & Crenshaw Boulevard - Change the signal phasing to reflect a permitted phase for the northbound movement. This improvement will mitigate the project-related impacts to a less than significant level.

9. Pico Boulevard & Arlington Avenue - Re-stripe Pico Boulevard to provide an exclusive westbound right-turn lane. This will be accomplished by re-striping both eastbound and westbound approaches along Pico Boulevard, currently with 60' curb-to-curb width, resulting in one left-turn lane and two through lanes for the eastbound approach and one left-turn lane, two through lanes and one right-turn lane for the westbound approach.

10. Pico Boulevard & Western Avenue - Change the signal phasing to reflect a protected-permitted phase for the southbound movement. This improvement will mitigate the project-related impacts to a less than significant level.

11. Pico Boulevard & Norton Avenue - Re-stripe Pico Boulevard to provide for an eastbound and westbound left-turn lane. This will be accomplished by re-striping both eastbound and westbound approaches along Pico Boulevard, currently with 56' curb-to-curb width, resulting in one left-turn lane and two through lanes for each approach.

City of Los Angeles Ordinance

It should be noted that roadway improvements on Pico Boulevard and San Vicente Boulevard may be implemented in accordance with a City of Los Angeles ordinance which requires roadways to be improved to General Plan classification when developments are approved. If Pico and San Vicente Boulevards are widened to satisfy General Plan requirements as part of the project description, it may eliminate the need to include these improvements as part of the mitigation package. However, this would require further consultations between LADOT and the MTA. For purposes of this analysis, the roadway improvements were not assumed to be part of the project.

7.2.5 Unavoidable Significant Adverse Impacts

The effectiveness of the mitigation measures described above was assessed by conducting intersection capacity analyses at each of the significantly impacted intersections with the suggested physical improvements. The results are summarized on Table 7-16 (Alternative A), Table 7-17 (Alternative B), and Table 7-18 (Alternative C), and indicate that the improvements would mitigate the project

7.3 PARKING

7.3.1 Environmental Setting

Parking in the project area is currently located on major thoroughfares including Crenshaw, Venice, Olympic and Pico Boulevards, Wilton Place and Arlington Avenue, as well as along local streets in the general vicinity of proposed transit stations. Table 7-1 (Existing Surface Street Physical Characteristics) contained in Section 7.2 (Traffic) describes existing parking restrictions on these streets. Some off-street parking is also provided in association with commercial uses located along each of the proposed alternatives, although these parking areas cannot be used for all-day transit parking.

In general, on- and off-street parking throughout the proposed project area could be characterized as adequate for the existing uses~~ limited, with minimal amounts of all-day parking currently available~~.

7.3.2 Project Impacts

7.3.2.1 Construction Impacts

Alternative A (Wilton/Arlington/Pico)

Some on-street parking would be temporarily eliminated during the relocation of utilities and the cut-and-cover activity associated with construction of the twin tunnels. The relocation of storm drains would temporarily eliminate parking along Pico Boulevard between Victoria and Mullen Avenues; and Queen Anne Place from a point approximately 500 feet south of its intersection with W. 12th Street and Pico Boulevard. The relocation of a sewer in Crenshaw Boulevard would temporarily eliminate parking for a 100-foot distance north and south of Pico Boulevard. These locations are graphically displayed on Figures 7-34 and 7-35.

Cut-and-cover within Arlington Avenue associated with construction of the Olympic/Arlington Station would temporarily eliminate parking for approximately 600 feet south of Olympic Boulevard. Parking would not be allowed on the decking over the station box excavation site due to the need for vent shafts and emergency exits outside the footprint of the station box. Cut-and-cover within Pico Boulevard for construction of the twin tunnels would temporarily eliminate parking between Victoria Avenue and West Boulevard for a distance of approximately 1,700 feet in the public right-of-way.~~ Once the concrete decking has been put in place, parking would return to normal conditions.~~

Alternative B (Wilton/Arlington/Venice)

Some on-street parking would be temporarily eliminated during the relocation of utilities and the cut-and-cover activity associated with construction of the twin tunnels. The relocation of storm drains would temporarily eliminate parking along Venice Boulevard between Victoria Avenue and West Boulevard. The relocation of a sewer in Crenshaw Boulevard would temporarily eliminate parking for a 100-foot distance north and south of Venice Boulevard. These locations are graphically displayed on Figures 7-36 and 7-37.

Cut-and-cover activity within Arlington Avenue associated with construction of the Olympic/ Arlington Station would temporarily eliminate parking for approximately 600 feet south of Olympic Boulevard. Parking would not be allowed on the decking over the station box excavation site due to the need for vent shafts and emergency exits outside the footprint of the station box. Cut-and-cover within Venice Boulevard for construction of the twin tunnels would temporarily eliminate parking between Victoria Avenue and San Vicente Boulevard for a distance of approximately 1,920 feet in the public right-of-way. ~~Once the concrete decking has been put in place, parking would return to normal conditions.~~

Alternative C (Crenshaw/Pico)

Some on-street parking would be temporarily eliminated during the relocation of utilities and the cut-and-cover activity associated with construction of the twin tunnels. The relocation of storm drains would temporarily eliminate parking along West 9th Street between Crenshaw Boulevard and South 5th Avenue; along South Bronson Avenue for approximately 750 feet south of Country Club Drive; along Victoria Avenue between West 9th Street and Olympic Boulevard; along Crenshaw Boulevard for approximately 1,100 feet south of Country Club Drive; along Pico Boulevard between Victoria and Mullen Avenues, and along Queen Anne Place from a point approximately 500 feet south of its intersection with W. 12th Street and Pico Boulevard. The relocation of sewers would temporarily eliminate parking along West 9th Street between Crenshaw Boulevard and South Norton Avenue; along Victoria Avenue between West 9th Street and Olympic Boulevard; along Crenshaw Boulevard for approximately 900 feet beginning 900 feet south of Country Club Drive. These locations are graphically displayed on Figures 7-38 and 7-39.

Cut-and-cover activity within Crenshaw Boulevard associated with construction of the twin tunnels and the Olympic/Crenshaw Station would temporarily eliminate parking in two-block increments between 8th Street and a point approximately 1,100 feet south of Country Club Drive. Parking would not be allowed on the decking over the station box excavation site due to the need for vent shafts and emergency exits outside the footprint of the station box. Cut-and-cover within Pico Boulevard for construction of the twin tunnels would temporarily eliminate parking between Victoria Avenue and West Boulevard for a distance of approximately 1,700 feet in the public right-of-way. ~~Once the concrete decking has been put in place, parking would return to normal conditions.~~

All Alternatives

A potentially significant construction-related parking impact could occur if construction employees were allowed to park their personal vehicles on the street during construction. ~~This will be addressed in the mitigation section.~~ Overall, due to the amount of parking currently available throughout the project area, the temporary loss of parking which would occur during construction would not be considered significant.

7.3.2.2 Operation and Maintenance Impacts

Potential parking impacts associated with the operation of the Red Line were assessed by comparing projected demand for parking against proposed parking supply for each station site. The parking impact analysis for the proposed Metro Red Line Mid-City Segment project considered two issues: (1) the potential impact that implementation of the rail line may have on the overall parking demand in the area; and (2) the impact on the parking supply resulting from the demand for parking generated by the rail line patrons.

Impact on Project Area Parking

In terms of the potential impact of the rail line on area-wide parking, the existing general purpose parking in the area is adequate for the existing uses~~fairly limited, and would not be changed as a result of the proposed project~~. At the proposed Pico/ or Venice/San Vicente Station, an additional 1,000 parking spaces (constructed in phases) would be provided to serve the Red Line patrons.

In general, the increase in transit and rail usage in the area would likely result in an overall reduction in vehicle usage, with a corresponding reduction in parking demand for the area. Once again, the exception to this would be at the proposed Pico/ or Venice/San Vicente Station, where additional demand for parking would be created and provided. Therefore, in terms of overall parking-related impacts potentially affecting the area, the proposed project would be considered to have a positive affect.

Project Parking Demand and Supply

To address the potential impacts on the parking supply resulting from the demand generated by the rail line itself, the projected parking demand ~~at each station~~ was compared to ~~weighed against~~ the proposed supply ~~of parking that would be provided~~ at the ~~proposed~~ stations.

As currently proposed, no off-street parking would be provided at the Olympic/Arlington Station (Alternatives A and B1/B2) or the Olympic/Crenshaw Station (Alternative C). Kiss-and-ride spaces would be provided curbside.

For all alternatives, the plans for the Pico/ or Venice/San Vicente Station include a total of 275 spaces provided initially, of which 250 spaces will be designated for use by park-and-ride passengers and 25 by kiss-and-ride passengers. Ultimately, as the parking demand increases, the number of park-and-ride spaces would be increased to 1,000 spaces, 250 spaces at a time, resulting in a total parking supply at build-out of 1,025 spaces.

Parking Demand at Stations

Alternative A (Wilton/Arlington/Pico)

For Alternative A, parking impacts were evaluated in the vicinity of the Olympic/Arlington station and the Pico/San Vicente station.

- **Olympic/Arlington Station**

Passenger forecasts (Table 7-5) indicate that the total daily patronage (Year 2020) for the Olympic/Arlington Station is projected to be 2,875 with a total of 175 accessing the station by auto. Since there would be no parking provided at this station, all auto patrons were assumed to be kiss-and-ride patrons. Patrons that require parking would have to use the Wilshire/Western Station (public lots) or the Pico/ or Venice/San Vicente Station park-and-ride lot.

Kiss-and-Ride

The number of patrons accessing the station by automobile in the morning peak hour is estimated to be 33 passengers. Assuming an average vehicle occupancy (AVO) of 2.0, with one Red Line patron and one driver, and based on planning estimates of four minutes of loading/unloading time per automobile, and assuming a uniform arrival and departure rate during the peak hour, it is estimated that the minimum number of parking spaces needed for kiss-and-ride passengers at this station is two. Passenger flow characteristics indicate that the maximum arrival rate for a short period of time may be as much as 50% higher than the average rate. This results in a need for four parking spaces for kiss-and-ride passengers at the Olympic/Arlington Station.

To meet the projected demand, a drop-off area~~s~~ would be provided along Olympic Boulevard at the north end of the station plaza ~~on the southwest corner, and along Arlington Avenue on the southwest corner, in front of the station entrance~~. ~~Each of~~ The drop-off area~~s~~ would provide storage for approximately four cars (see Figure 2-3)

~~for a total of eight kiss-and-ride spaces~~. The projected demand for four kiss-and-ride spaces would be met~~, with a parking surplus of four spaces~~.

Park-and-Ride

Park-and-Ride facilities have not been programmed for the Olympic/Arlington Station. Convenient, nearby long-term parking would be available at the Wilshire/Western Station (public lots) or the Pico/ or Venice/San Vicente Station park-and-ride lot.~~and, therefore, parking deficiencies and accompanying spillover parking impacts have not been quantified.~~ However, the possibility of unplanned, informal park-and-ride activities, resulting in parking intrusion in the immediately adjacent neighborhoods, is recognized as a potential impact of this station.

- **Pico/San Vicente Station**

In 2020, it is estimated that a ~~A~~ total of 2,145 patrons would access the Pico/San Vicente Station via auto, of which 35%, or 751 passengers, would be kiss-and-ride patrons, with the remaining 1,394 being park-and-ride patrons (see Table 3-1).

Kiss-and-Ride

The peak arrival rate for kiss-and-ride passengers at the Pico/San Vicente Station is projected to be 144 passengers in the morning peak hour. Using the assumptions described above, it is estimated that the minimum number of spaces for kiss-and-ride passengers at this station would be 10, with a projected requirement of 15 spaces to address surges in passenger arrival rates. A total of 25 spaces is planned for the Pico/San Vicente station, which would meet the projected demand, with an excess of 10 spaces.

Park-and-Ride

To estimate parking demand (Year 2020) for park-and-ride passengers, data from the *LACMTA Northern San Gabriel - San Bernardino Valley Rail Transit Corridor DEIR* (Gruen Associates, August 1993) was used to estimate that 43% of the 1,394 daily park-and-ride passengers expected to use the Pico/San Vicente Station are expected to be commuters, with the remaining 57% being non-commuters (see Table 7-5). Commuters are expected to use the parking space all day, with no turnover, while non-commuters are expected to use the space only a portion of the day, with a turnover rate of 2.5. Using these assumptions, the peak parking demand for each non-commuter would be 40% of the demand for each commuter. Assuming an AVO of 1.3 passengers per vehicle, it is estimated that the peak parking demand for commuters would be 461 spaces (1,394 autos x .43 commuters/1.3 AVO) and 244 spaces for non-commuters (1,394 autos x .57 non-commuters x .40 usage/1.3 AVO). This results in a demand of 705 parking spaces for park-and-ride passengers at the Pico/San Vicente Station. The proposed parking supply of 1,000 spaces (Year 2020) at the Pico/San Vicente Station would provide an excess of 295 spaces for park-and-ride patrons.

Table 7-19 summarizes the estimated Year 2020 parking supply and demand for kiss-and-ride and park-and-ride patrons for the proposed stations for Alternative A, based on the analysis described above.

The data in the table indicates that with the drop-off areas, the Olympic/Arlington Station would provide enough supply to meet the projected kiss-and-ride parking demand. The table also indicates that under the ultimate conditions, with the projected ridership, the Pico/San Vicente Station would have a surplus of 10 kiss-and-ride spaces and a surplus of 295 park-and-ride spaces.

Table 7-19
Estimated (Year 2020) Parking Supply and Demand for the Proposed Stations - Alternative A

Station	Passenger Type	Supply	Demand	Surplus (Deficiency)
Olympic/Arlington	Kiss-and-Ride	~~8~~4	4	~~4~~0
	Park-and-Ride	0	N/A*	N/A
Pico/San Vicente	Kiss-and-Ride	25	15	10
	Park-and-Ride	1000	705	295

* Demand was not quantified.

<u>Alternatives B1 and B2 (Wilton/Arlington/Venice)</u>

For Alternatives B1 and B2, parking impacts were evaluated in the vicinity of the Olympic/Arlington Station and the Venice/San Vicente Station.

- **Olympic/Arlington Station**

Passenger forecasts (Table 7-5) indicate that the total daily patronage for the Olympic/Arlington Station is projected to be 2,875 with a total of 175 accessing the station by auto. Since there would be no parking provided at this station, all auto patrons are assumed to be kiss-and-ride patrons.

<u>Kiss-and-Ride</u>

The kiss-and-ride requirements for Alternative B are the same as those described for Alternative A.

~~The number of patrons accessing the station by automobile in the morning peak hour was estimated to be 33 passengers, which would result in a requirement of 4 parking spaces, using the planning assumptions described above.~~

~~To meet the projected demand, drop-off areas would be provided along Olympic Boulevard on the southwest corner, and along Arlington Avenue on the southwest corner, in front of the station entrance. Each of the drop-off areas would provide storage for approximately four cars (see Figure 2-3). Therefore, the projected demand for kiss-and-ride spaces would be met, with an excess of four spaces.~~

<u>Park-and-Ride</u>

The park-and-ride requirements for Alternative B are the same as those described for Alternative A.

~~Park-and-Ride facilities have not been programmed for the Olympic/Arlington Station. Convenient, nearby long-term parking would be available at the Wilshire/Western Station (public lots) or the Pico/ or Venice/San Vicente Station park-and-ride lot. and, therefore, parking deficiencies and accompanying spillover parking impacts have not been quantified. However, the possibility of unplanned, informal park-and-ride activities, resulting in parking intrusion in the immediately adjacent neighborhoods, is recognized as a potential impact of this station.~~

- **Venice/San Vicente Station**

A total of 2,145 patrons would access the station via auto, of which 35%, or 751 passengers, would be kiss-and-ride patrons, with the remaining 1,394, being park-and-ride patrons.

Kiss-and-Ride

The Year 2020 peak arrival rate for kiss-and-ride passengers at the Venice/San Vicente Station is projected to be 144 passengers in the morning peak hour. Using the assumptions described above, it is estimated that the minimum number of spaces for kiss-and-ride passengers at this station would be 10, with a projected requirement of 15 spaces to address surges in passenger arrival rates. A total of 25 spaces is planned for the Pico/San Vicente station, which would meet the projected demand, with an excess of 10 spaces.

Park-and-Ride

Using the assumptions described above to assess park-and-ride demand (1.3 AVO; 43% commuters, 57% non-commuters; 1.0 turnover for commuters and 2.5 turnover for non-commuters), the 1,394 park-and-ride patrons would generate a parking demand for 705 parking spaces (1,394 autos x .43 commuters/1.3 AVO = 461 plus 1,394 autos x .57 non-commuters x .40 usage/1.3 AVO = 244) at the Venice/San Vicente Station. The proposed parking supply of 1,000 spaces at the Venice/San Vicente Station would provide an excess of 295 spaces for park-and-ride patrons (Year 2020).

Table 7-20 summarizes the estimated Year 2020 parking supply and demand for the proposed stations for Alternatives B1 and B2, based on the analysis described above.

The data in the table indicates that with the drop-off areas, the Olympic/Arlington Station would provide enough supply to meet the projected kiss-and-ride parking demand. The table also indicates that under the ultimate conditions, the Venice/San Vicente Station would have a surplus of 10 kiss-and-ride spaces and a surplus of 295 park-and-ride spaces.

Table 7-20
Estimated Parking Supply and Demand for the Proposed Stations - Alternatives B1 and B2 (Year 2020)

Station	Passenger Type	Supply	Demand	Surplus (Deficiency)
Olympic/Arlington	Kiss-and-Ride	~~8~~4	4	~~4~~0
	Park-and-Ride	0	N/A	N/A
Venice/San Vicente	Kiss-and-Ride	25	15	10
	Park-and-Ride	1000	705	295

* Demand was not quantified.

Alternative C (Crenshaw/Pico)

For Alternative C, Year 2020 parking impacts were evaluated in the vicinity of the Olympic/Crenshaw Station and the Pico/San Vicente Station.

Olympic/Crenshaw Station

Passenger forecasts (Table 7-6) indicate that the total daily patronage (Year 2020) for the Olympic/Crenshaw Station is projected to be 3,626, with a total of 333 accessing the station by auto. Since there would be no parking provided at this station, all auto patrons were assumed to be kiss-and-ride patrons. Patrons that require parking would have to use the Wilshire/Western Station (public lots) or the Pico/ or Venice/San Vicente Station park-and-ride lot.

Kiss-and-Ride

The peak arrival period for the kiss-and ride passengers is expected to occur during the morning peak hour and is estimated to be 61 passengers. Based on planning estimates of four minutes of loading/unloading time per automobile, and assuming a uniform arrival and departure rate during the peak hour, it is estimated that the minimum number of parking spaces needed for kiss-and-ride passengers at this station is four.

Passenger flow characteristics indicate that the maximum arrival rate for a short period of time may be as much as 50% higher than the average rate. This results in a need for 6 parking spaces for kiss-and-ride passengers at the Olympic/Crenshaw Station. To meet the projected demand, drop-off areas would be provided along Crenshaw Boulevard on the northeast and southwest corners, in front of the station entrances. Approximately 190 feet would be available on the southwest corner which could accommodate storage for about eight cars. On the northeast corner, approximately 115 feet would be available, which would provide storage for approximately five cars for a total of 13 parking spaces. Therefore, the projected demand for kiss-and-ride spaces would be met, with an excess of 7 spaces.

Park-and-Ride

Park-and-Ride facilities have not been programmed for the Olympic/Crenshaw Station. Convenient, nearby long-term parking would be available at the Wilshire/Western Station (public lots) or the Pico/ or Venice/San Vicente Station park-and-ride lot.~~ and, therefore, parking deficiencies and accompanying spillover parking impacts have not been quantified.~~ However, the possibility of unplanned, informal park-and-ride activities, resulting in parking intrusion in the immediately adjacent neighborhoods, is recognized as a potential impact of this station.

- **Pico/San Vicente Station**

In the Year 2020, a ~~A~~ total of 2,048 patrons would access the Pico/San Vicente Station via auto, of which 35%, or 713 passengers, would be kiss-and-ride patrons, with the remaining , 1,325 being park-and-ride patrons.

Kiss-and-Ride

The peak arrival rate for kiss-and-ride passengers in the Year 2020 at the Pico/San Vicente Station is projected to be 137 passengers in the morning peak hour. Using the same assumptions described above, it is estimated that the minimum number of spaces for kiss-and-ride passengers at this station would be 9, with a projected requirement of 14 spaces to address surges in passenger arrival rates.

Park-and-Ride

Using the assumptions described above to assess park-and-ride demand (1.3 AVO; 43% commuters, 57% non-commuters; 1.0 turnover for commuters and 2.5 turnover for non-commuters), the 1,325 park-and-ride patrons would generate a parking demand for 670 parking spaces (1,325 autos x .43 commuters/1.3 AVO = 438 plus 1,394 autos x .57 non-commuters x .40 usage/1.3 AVO = 232). The proposed parking supply of 1,000 spaces at the Pico/San Vicente Station would provide an excess of 330 spaces for park-and-ride patrons in the Year 2020.

Table 7-21 summarizes the estimated parking supply and demand for the proposed stations in the Year 2020, based on the analysis described above.

Table 7-21
Estimated Parking Supply and Demand for the Proposed Stations
Alternative C (Year 2020)

Station	Passenger Type	Supply	Demand	Surplus (Deficiency)
~~Olympic/Arlington~~	~~Kiss-and-Ride~~	~~13~~	~~4~~	~~9~~
	~~Park-and-Ride~~	~~0~~	~~NA~~	~~NA~~
Olympic/Crenshaw	Kiss-and-Ride	13	6	7
	Park-and-Ride	0	N/A*	N/A
Pico/San Vicente	Kiss-and-Ride	25	14	11
	Park-and-Ride	1000	670	330

* Demand was not quantified.

The data in the table indicates that with the drop-off areas, the Olympic/Crenshaw Station would provide enough supply to meet the projected kiss-and-ride parking demand. The table also indicates that under the ultimate conditions, the Pico/San Vicente Station would have a surplus of 10 kiss-and-ride spaces and a surplus of 330 park-and-ride spaces.

7.3.3 Cumulative Impacts

7.3.3.1 Construction Impacts

A mitigation measure has been added to require that construction worker parking be provided in a separate area which would be established, and therefore would not utilize existing area parking. No project impact would occur; no cumulative impact would occur.

7.3.3.2 Operation and Maintenance Impacts

A potential cumulative impact related to parking would be associated with the proposed Crenshaw-Prairie Line which would utilize the proposed Pico/ or Venice/San Vicente Station. ~~Since~~ The amount of parking currently proposed for this area is based on the projected need associated with the proposed project.~~the potential exists for a shortage of parking once, and~~ If the Crenshaw-Prairie Line is constructed the parking supply at the Pico/ or Venice/San Vicente Station site would have to be adjusted per the demand created by this new line.

7.3.4 Mitigation Measures

The following mitigation measures are proposed to reduce or eliminate parking-related impacts. These measures are applicable to Alternatives A, B1, B2, and C.

Construction

1. The MTA will provide off-street parking which will be sufficient to accommodate construction personnel and/or other contractors during all phases of construction. Contractors will not park on-street or in business parking lots.

2. The MTA will provide advanced notification of temporary loss of parking due to construction and, as necessary, will provide ~~identify~~ temporary replacement parking locations.

Operation

The potential exists for spillover parking in adjacent neighborhoods, particularly adjacent to the Olympic/Arlington or the Olympic/Crenshaw Stations, where informal park-and-ride activities may occur, due to the unavailability of all-day park-and-ride spaces. In addition, the potential exists for spillover parking in adjacent neighborhoods adjacent to the Pico/San Vicente or the Venice/San Vicente Station, due to unforeseen parking demand, including diversion of parking from the Olympic/Arlington or Olympic/Crenshaw Stations.

The following possible parking mitigation measures may be implemented, with the participation and cooperation of affected agencies and/or the private sector:

3. The MTA will continuously monitor the usage of park-and-ride spaces at the Pico/ or Venice/San Vicente Station to determine when, and if, additional spaces will be required. When the then-current parking supply is observed to be 80% utilized on 75% of the days observed, the MTA will initiate construction of the next phase of parking supply. If the ultimate parking supply, when built, is observed to be 80% utilized on 75% of the days observed, then additional parking mitigation measures will be implemented, as outlined below.

~~4. The MTA will, on an annual basis, monitor the occurrence of spillover parking in the neighborhoods adjacent to the project stations, and implement appropriate control measures, as outlined here further, if deemed necessary.~~

4. The MTA will encourage developers and employers to take advantage of the City of Los Angeles Parking Management Plan, which is designed to effectively reduce both the cost of parking (by allowing off-site facilities) and the need for parking (by encouraging vanpools, ridesharing and transit usage).~~Providing additional free parking can actually be counter-productive to diverting auto trips to the Red Line system; the system itself is a parking mitigation measure, since it makes transit a more attractive alternative to the automobile.~~

5. The MTA will promote joint development at stations. This approach offers the opportunity to take transit directly to a shopping or employment destination, reducing vehicle trips and parking demand, while

supporting the development.~~ The City of Los Angeles is working with MTA to maximize joint development opportunities.~~

6. The MTA will conduct studies twice per year of potential parking intrusion in neighborhoods adjacent to each station area.

7. Based on the results of neighborhood parking intrusion studies, the MTA will evaluate the need and desirability of developing preferential parking districts within residential neighborhoods adjacent to station areas. This ongoing program, managed by LADOT, requires local property owners to prepare petitions and obtain City Council approval. Where parking districts are deemed necessary due to the Red Line operation, the MTA will assist residents in preparing and circulating the necessary petitions.

8. The MTA will pursue opportunities to include more project-provided parking for the station areas, where necessary.

9. The MTA will continue to evaluate opportunities to serve the rail stations with local bus lines, and make appropriate modifications to bus routing to encourage and increase transit access to the Red Line. Modifications will include routing area bus lines through the bus transfer facility, relocating bus stops to facilitate pedestrian movement between the bus stop and the station, and coordinating bus and Red Line schedules to allow for convenient and efficient connections and transfers.

10. The MTA will pursue opportunities (where and when necessary) to obtain limited parking rights in existing parking facilities that may have parking availability during the day (such as area churches and commercial businesses that have excess daytime parking available).

11. The MTA will provide bicycle parking at the stations.

12. The MTA will provide safe and convenient pedestrian access to the stations, by providing pedestrian amenities such as sidewalks; nighttime lighting; walkovers, or grade-separated pedestrian facilities to separate pedestrian and vehicle traffic wherever practical; directional signing; direct pathing from bus stops to rail platforms; station security; and convenient access to ticket machines and schedule racks.

13. The MTA will provide preferential parking for carpools and vanpools.

14. The MTA will include provisions for the future accommodation of electric vehicle parking in the design, engineering and construction of station parking facilities. This includes the ability to provide electric outlets in parking lots, and battery charging service stations within station areas.

7.3.5 Unavoidable Significant Adverse Impacts

No unavoidable significant adverse parking impacts would occur during either the construction or operation of the proposed project.

7.4 LAND USE

7.4.1 Environmental Setting

Overview

Information contained in this section of the SEIS/SEIR was obtained from all applicable elements of the City of Los Angeles General Plan, including the Framework Element, Community Plans and Specific Plans, applicable plans prepared by or for the Community Redevelopment Agency (CRA) and SCAG. These documents and relevant policies and programs are discussed in this section. Rather than continually cite these documents they are included in the Bibliography and incorporated by reference herein. These documents are available for review at the Los Angeles City Planning Department and the Community Redevelopment Agency of the City of Los Angeles.[1]

For the purpose of this document, the amount of area to be evaluated in terms of existing land uses and potential impact area includes those properties within an approximate distance of one-block along each side of each proposed alignment, and an approximate one-half mile (0.5 mile) radius around each proposed station location (station influence area). The station influence areas are depicted on Figure 7-17 (shown later in this Section). Land uses along each of the proposed alignments are discussed in the order in which they would be encountered between the existing Wilshire/Western Station and the proposed terminus station near the intersection of Pico, Venice and San Vicente Boulevards. Land uses within the 0.5-mile radius of the proposed station locations are discussed separately.

Existing Land Uses

Information provided in this land use analysis was derived from a comprehensive land use survey conducted in early 1997. Land uses throughout the proposed project area vary substantially, with land uses located along each of the proposed corridors consisting of 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 City of Los Angeles. This would include commercial, retail, office uses, and residential (single-family and multi-family) fronting along primary arterials, with differing densities of residential uses located in the areas adjacent to those arterials. There are some portions of some alignments where residential uses front directly onto the proposed alignment; some of the residences have been converted to small offices or other types of businesses. It should also be noted that numerous residential units located throughout the proposed project area may be of some historic importance. Strong single-family neighborhoods exist off the main boulevards. Some areas have older large single-family homes that have been converted to apartments. Apartments are interspersed throughout the area, primarily nearer on the main boulevards.

The specific land uses along each of the proposed alignments are as follows:

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[1]/ Los Angeles City Planning Department is located at 221 North Figueroa, 16th Floor, Los Angeles, CA 90012. The Community Redevelopment Agency is located at 354 South Spring Street, Suite 700, Los Angeles CA 90013.

Alternative A (Wilton/Arlington/Pico)

Land uses along Wilshire Boulevard immediately west of the existing Wilshire/Western Station include a variety of commercial, retail, and office uses, as well as one motel, and several empty lots, most of which are used for parking. As the proposed alignment arcs toward the south, away from Wilshire Boulevard, land uses consist primarily of residential uses, most of which are multiple-family units, with one neighborhood retail establishment and several undeveloped lots interspersed among the residential areas. At the point where the proposed alignment begins to parallel Wilton Place (at the intersection of Wilton Place and 8th Street) there is a public school (Wilton Place Elementary) and a church, with the majority of remaining uses along Wilton Place between 8th Street and Olympic Boulevard dedicated to a mix of single- and multiple-family residential uses, some of which also serve as offices or day care/pre-school uses.

Land uses immediately surrounding the intersection of Olympic Boulevard and Wilton Place/Arlington Avenue consist of a mix of professional office uses, retail establishments, and light manufacturing uses. Specific uses include KATV Station, a medical facility, a gas station, and a Buddhist Temple. These uses are shown in Figure 7-15. As the proposed alignment continues south along Arlington Avenue, land uses are primarily single-family residential up to a point just north of Pico Boulevard. As the proposed alignment arcs to the west beneath residential areas, it begins to parallel Pico Boulevard. Land uses along this segment of Pico Boulevard consist primarily of retail uses, vacant storefronts, and auto related uses. ~~with~~ Numerous professional offices and light manufacturing uses are also interspersed throughout the area. There are ~~also~~ several parking lots and other sites used for day-care/pre-schools, churches, and one motel. Land uses adjacent to the commercial uses along Pico Boulevard are dedicated to a relatively even mix of single- and multi-family residential uses.

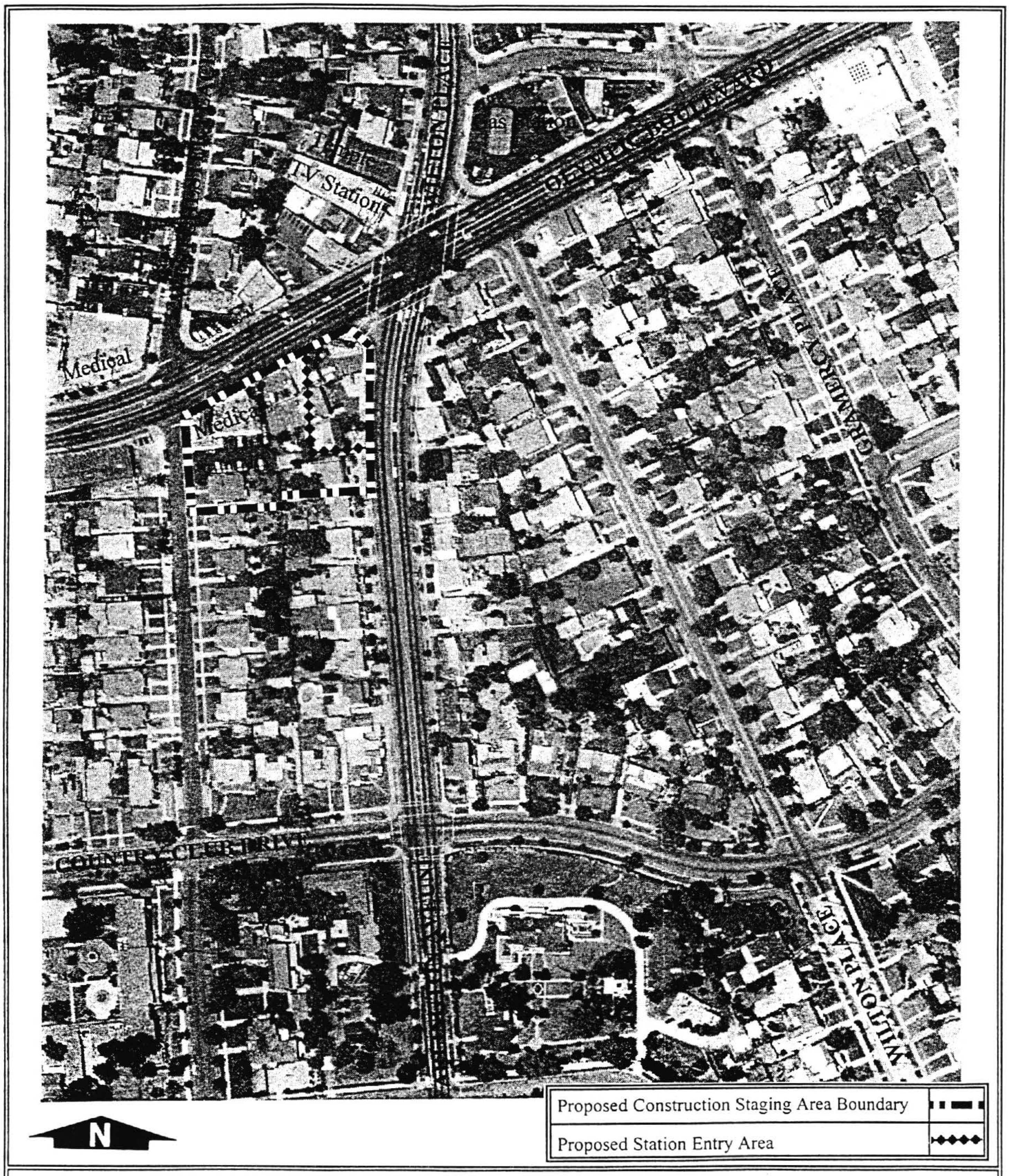
Existing land uses at the proposed Pico/San Vicente Station (south side of Pico Boulevard) include a small neighborhood-oriented strip mall, a Builders Discount store (former Sears building), the Eleanor Green Roberts Aquatic Center which is owned and operated by the City Recreation and Parks Department, and the Pico/Rimpau Transit Center. This station serves as the eastern terminus for some Santa Monica bus lines, and as the western terminus for some MTA bus lines. An old vacant building (former Builders Emporium site) is located at the western-most boundary of this site. These uses are shown in Figure 7-16.

Alternative B (Wilton/Arlington/Venice)

Land uses along this proposed alignment are identical as those discussed under Alternative A, up to the point where Alternative A begins to arc to the west along Pico Boulevard. The Alternative B alignment does not arc to the west at this point, but continues in a southerly direction towards Pico Boulevard. Land uses at the Pico Boulevard/ Arlington Avenue intersection include commercial/retail uses on northeast and southwest corners, with a church and Pio Pico Elementary/Junior High School located on the northwest and southeast corners, respectively. Immediately south of Pico Boulevard, Alignment B turns in a westerly direction under the mixed-use and residential areas located west of Arlington Avenue, between Venice and Pico Boulevards.

At a point near the intersection of Norton Avenue and Venice Boulevard, Alignment B continues west within the Venice Boulevard right-of-way. Land uses along this section of Venice Boulevard consist of strip commercial centers and neighborhood retail uses located at or near the intersections, with most of the land uses between the commercial uses consisting of a mix of single- and multi-family residences.

On Venice Boulevard between Crenshaw Boulevard and the proposed Venice/San Vicente Station site, land uses are primarily single-family residential. This includes the Victoria Park residential neighborhood which is north of Venice Boulevard, and the Lafayette Square residential neighborhood located south of Venice Boulevard.



ULTRASYSTEMS
ENVIRONMENTAL
INCORPORATED

FIGURE 7-15
AERIAL PHOTOGRAPH OF EXISTING LAND USES
OLYMPIC/ARLINGTON STATION

Site Boundary

N

ULTRASYSTEMS
ENVIRONMENTAL
INCORPORATED

FIGURE 7-16
AERIAL PHOTOGRAPH OF EXISTING LAND USES - PICO SAN VICENTE/VENICE SAN VICENTE STATION

Alternative C (Crenshaw/Pico)

This proposed alignment does not arc to the south along Wilton Place as do Alternatives A and B, but continues west along Wilshire Boulevard where commercial, office and retail uses front onto Wilshire Boulevard, decreasing in density as it proceeds west. At a point near the intersection of Wilshire Boulevard and Bronson Avenue, Alignment C arcs to the south through primarily multi-family residential uses, and begins to parallel Crenshaw Boulevard a short distance north of 8th Street. Land uses along Crenshaw Boulevard, south of 8th Street consist of a mix of commercial and office uses, many of which are used as medical and/or related facilities. There are also numerous single- and multi-family residences interspersed along Crenshaw Boulevard, some of which have been converted into small office uses.

At a point 1,100 feet south of Country Club Drive, Alignment C arcs to the west where it proceeds within the Pico Boulevard right-of-way. Existing land uses along this stretch of Pico Boulevard, as discussed under Alternative A, consist of primarily of retail uses, with numerous professional offices and light manufacturing and other uses interspersed throughout the area, with single- and multi-family residential uses located adjacent to these uses.

Station Influence Areas

The following discussions identify, in general terms, the types of land uses located with an approximate 0.5-mile radius surrounding proposed station locations (see Figure 7-17).

Olympic/Arlington Station Influence Area (Alternatives A and B)

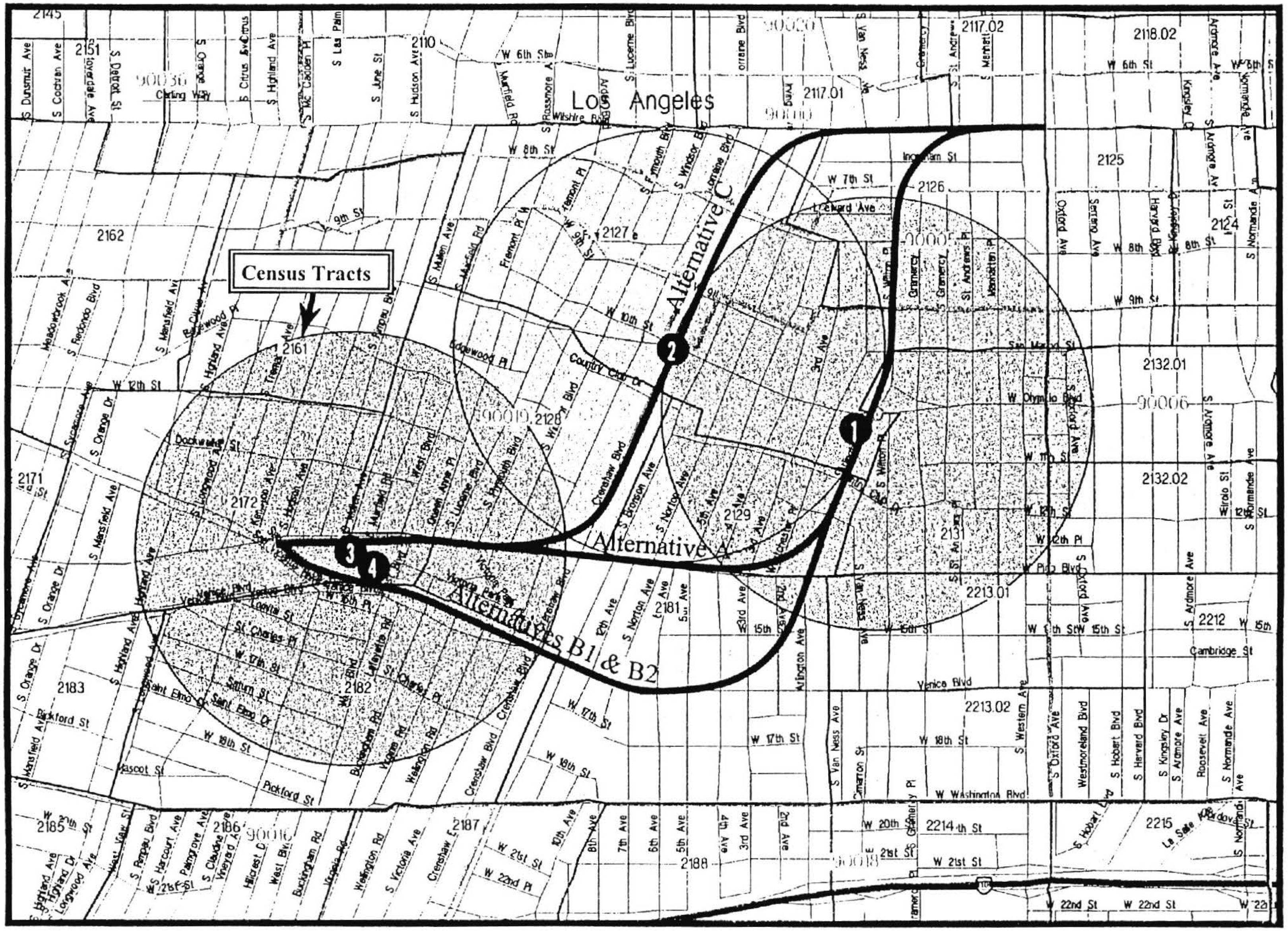
The 0.5-mile radius from the proposed Olympic/Arlington Station generally encompasses the area up to 7th Street to the north, 15th Street to the south, Serrano Avenue to the east, and Crenshaw Boulevard to the west. Land uses identified within this area consist primarily of single- and multi-family residential areas, with typical neighborhood-oriented strip malls and a variety of commercial uses on the main boulevards~~ interspersed throughout the area~~. Koreatown is located generally east of the proposed station, with the heaviest concentrations of retail, office and other commercial uses located along Western Avenue.

Olympic/Crenshaw Station Influence Area (Alternative C)

The 0.5-mile radius from the proposed Olympic/Crenshaw Station generally encompasses the area up to Wilshire Boulevard to the north, Pico Boulevard to the south, Wilton Place to the east, and Los Angeles High School to the west. Land uses identified within this area consist primarily of single- and multi-family residential areas, with typical neighborhood oriented strip malls and other commercial uses located along Olympic and Crenshaw Boulevards.

Pico or Venice/San Vicente Station Influence Area (All Alternatives)

The 0.5-mile radius from the proposed Pico or Venice/San Vicente Station generally encompasses the area up to Los Angeles High School to the north, Washington Boulevard to the south, Crenshaw Boulevard to the east, and Mansfield Avenue to the west. Land uses identified within this area consist primarily of residential areas, most of which are single-family homes, although numerous multi-family units are located throughout the area. As mentioned previously under Alternative A, existing land uses at the proposed Pico/ or Venice/San Vicente Station site include a small neighborhood-oriented strip mall, a Builders Discount store (former Sears building), the Eleanor Green Roberts Aquatic Center, and the Pico/Rimpau Transit Center.



❶ = Olympic/Arlington Station ❷ = Olympic/Crenshaw Station ❸ = Pico/San Vicente Station ❹ = Venice/San Vicente Station

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FIGURE 7-17
STATION INFLUENCE AREAS

The highest concentration of commercial uses is along Pico Boulevard. While much of the commercial uses west of the proposed station are relatively new, much of the commercial use to the east of this station site along Pico Boulevard is older and could be considered as falling short of being put to its highest and best use. Uses along Pico Boulevard include auto repair, local retail, small restaurants, and commercial office.

General Plan

Overview

Each incorporated City in the State of California is required, by law, to prepare and maintain a General Plan. A General Plan, as it's name implies, serves as a general guide to future growth and development of the city and contains broad goals, objectives and policies which have been determined by the local government and the residents as best serving the long term needs of the community. General Plans are comprised of separate "elements", each of which pertain to certain aspects of the city (i.e. land use, housing, circulation, et.al.). General Plans do not provide specific information regarding such things as building standards and landscaping requirements, and they are not parcel specific. What they do provide are general growth projections, discussions as to the desired amount and location of ~~a~~ certain land uses (i.e. industrial, residential, etc.), and discussions as to the interrelationships in future infrastructure needs (utilities, streets, sewers, etc.), the need for additional public services (i.e. police, fire protection, parks, etc.), and other city services.

General Plan elements applicable to the proposed project that are addressed in this section of the document include the Citywide Framework Element, Land Use Element, and Circulation Element. Each of these elements contain goals, policies and objectives that could affect, or be affected by the proposed project. It should also be noted that any proposed project must be consistent with the goals, policies, and objectives contained in all of the above-mentioned elements. The zoning code is required by law to be consistent with the General Plan.

Citywide General Plan Framework Element

The Framework Element defines citywide policies that will be implemented through subsequent amendments to the City's Community Plans, Specific Plans (to be discussed later), zoning ordinance, and other pertinent programs to accommodate population growth projected for the year 2010. One of the primary intents of the City set forth in the General Plan Framework Element is to encourage the development of a mix of new commercial, office, and entertainment uses in relatively close proximity to transit corridors and stations (rail and bus). This would be facilitated by establishing general land use designations which identify appropriate land uses at appropriate densities in order to support the local population and encourage activity near stations.

Two Chapters of the Framework Element contain goals, objectives and policies which are directly applicable to the proposed project. These include the Land Use and Transportation Chapters, each of which are summarized below.

Land Use Chapter

The Land Use chapter of the Framework Element includes goals, objectives, and policies relevant to the distribution of specific land uses, including specific criteria related to the density and character of those uses. In general, relevant policies contained in the Land Use chapter include: the allowance for flexibility in land use boundaries to accommodate new transit routes and stations; consideration of the appropriate type and density of land uses within one quarter mile of transit corridors and stations; and, creating a pattern of development consisting of distinct districts, centers, boulevards, and neighborhoods. This could be achieved by preparing detailed plans in transit-oriented districts which are consistent with established land use/transportation policies.

One of the primary goals contained in the Land Use Element is to preserve "stable" single-family neighborhoods. Other policies call for the incorporation of public- and neighborhood-serving uses and services in relative close proximity to transit stations; to increase the density within one quarter mile of transit stations, and; to promote pedestrian activity, bicycle and vehicular parking at, and in the vicinity of, transit stations. Coordination and cooperation with affected neighborhood groups would be encouraged to ensure that residents concerns are addressed in the implementation of these goals, and to protect the integrity of single-family neighborhoods.

The Land Use chapter also contains a Long Range Land Use Diagram for the Metro area of the City in which the proposed project is located (see Figure 7-18). This diagram provides categories that establish a linkage between transportation and land use functions and the characteristics of each. Several of the proposed project elements are located on this map, including the following:

- The Olympic/Arlington Station is identified as being located at the western end of a "Mixed Use Boulevard" which serves to connect neighborhoods and communities with other regional and downtown centers via public transportation. Mixed use development is encouraged at a scale that is compatible with surrounding areas.

- The Olympic/Crenshaw Station is identified as being within a designated Community Center which contains a diverse mix of uses such as small offices, overnight accommodations, cultural and entertainment facilities, schools and libraries.

- Pico Boulevard is identified as a "Mixed Use Boulevard."

- The Pico/San Vicente and Venice/San Vicente Stations are also located within a designated Community Center.

<u>Transportation Chapter</u>

The Transportation Chapter of the Framework Element includes goals, objectives and policies to achieve long-term mobility within the City through a multi-modal transportation system. The Transportation chapter identifies the proposed Metro Rail as part of an existing and planned multi-modal transportation system throughout the City, with the Olympic/Crenshaw and Pico/San Vicente Stations being identified as Fixed Rail Transit Lines and Stations. The Transportation Chapter was prepared before the Olympic/Arlington or the Venice/San Vicente Stations were proposed By the MTA or they would have also been described in the text of this chapter. Since the General Plan is not parcel specific, the revised station locations can be found to be consistent with the General Plan.

This chapter also includes the following policies relevant to the proposed rail line extension such as: to improve transportation services to support Citywide economic development; to support completion of the MTA rail transit system; to establish shuttle bus programs to serve transit stations; to promote the development of transit alignments and station locations which maximize transit service to activity centers; and to promote the enhancement of transit access to neighborhood districts, community and regional centers, and mixed-use boulevards by concentrating development around stations where appropriate and consistent with the existing neighborhood. This Chapter also contains policies and objectives which, while seeking to achieve transportation-specific goals, also seeks to maintain residential neighborhoods by minimizing the intrusion of traffic into neighborhoods.

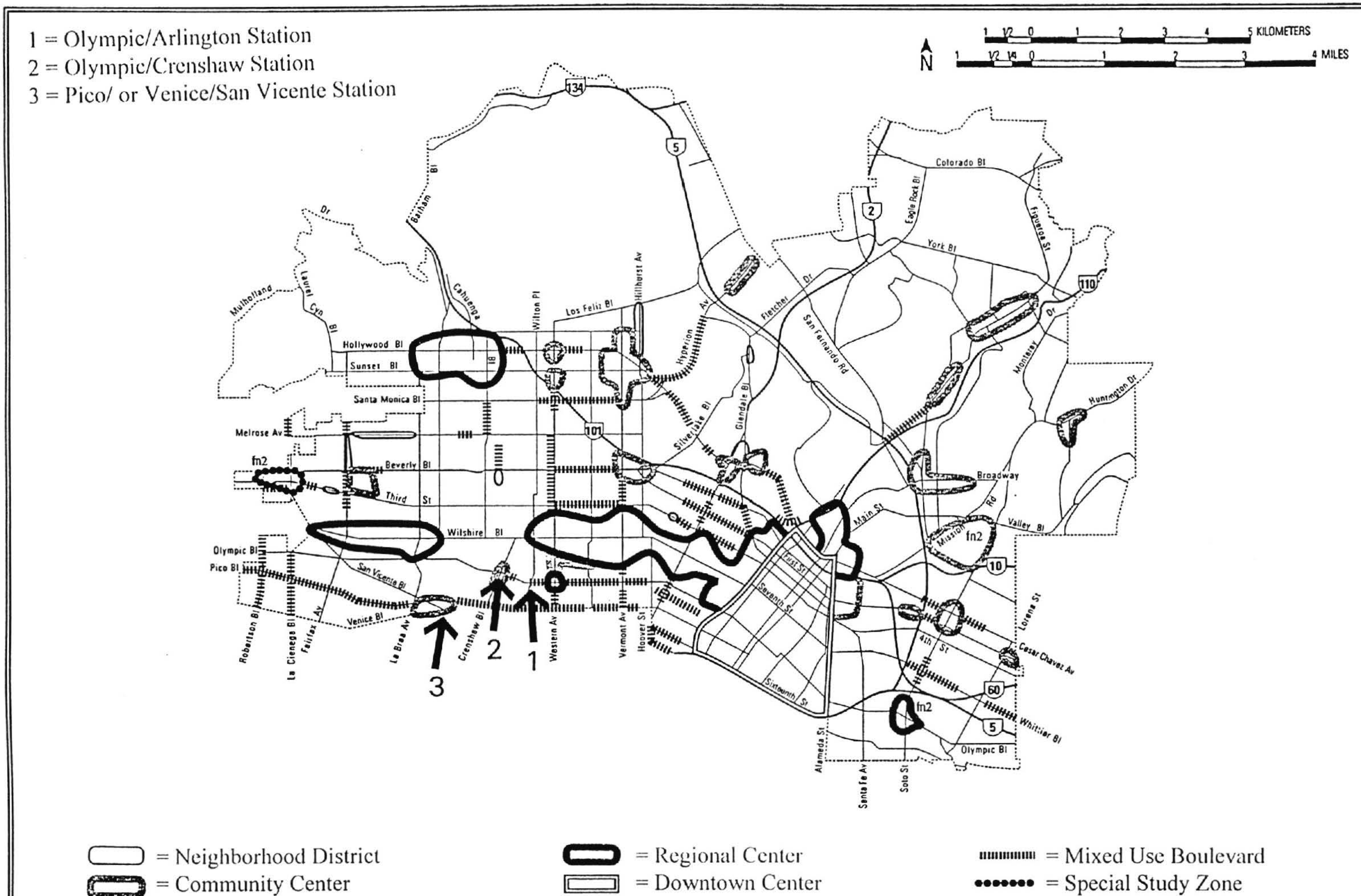

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FIGURE 7-18
LONG RANGE LAND USE DIAGRAM (METRO)

Preliminary Transportation Element of the General Plan

The Preliminary Transportation Element of the General Plan incorporates and revises the Scenic Highways Plan (originally adopted in 1978), and replaces the Highways and Freeways Element (originally adopted in 1959). This element incorporates changes to the Highways and Freeways Element and Scenic Highways Element that have occurred from subsequent development and Community Plan revisions throughout the City and adopted by resolution. The purpose of this element is to guide the further development of a citywide transportation system through the year 2010 and provide street designations and related standards. The Transportation Element also promotes strong linkages between land use, transportation, and air quality as identified in the Framework Element. Many of the policies contained in the Preliminary Transportation Element are also included in Chapter 8 (Transportation) of the Framework Element. The Preliminary Transportation Element is scheduled to be presented before the Planning Commission and City Council in mid-1997.

The Preliminary Transportation Element identified that the level of transit dependency for the project study area is one of the highest in the City. This Element also identifies an extension from Wilshire/Western to Pico/San Vicente programmed for completion by 2009.

The Preliminary Transportation Element provides additional information to public transit policies contained in the Framework Element. Included is the policy of actively supporting completion of the MTA Baseline (Red Line-Wilshire/Western to Pico/San Vicente) rail transit system by 2010, and ~~to~~ establishing the Red Line West extension (Pico/San Vicente to I-405, serving Century City) as high priority corridors to commence rail transit prior to year 2010. The Preliminary Transportation Element also identifies the Metro Rail Transit Line as extending from Wilshire/Western to Pico/San Vicente. The revised station locations are generally consistent with that~~s and Stations at Olympic/Crenshaw and Pico/San Vicente~~.

~~The Preliminary Transportation Element was prepared before the Olympic/Arlington or the Venice/San Vicente Stations were proposed By the MTA or they would have also been described in the text of this element.~~

The Preliminary Transportation Element also included the additional policies such as promoting the multi-modal function of transit centers (bus and rail), and to promote implementation of the Land Use/Transportation Policy as adopted by the City Council and as endorsed by the MTA Board.

This Land Use/Transportation Policy is included as Appendix G of the Preliminary Transportation Element of the General Plan and is discussed in greater detail below.

Land Use/Transportation Policy for the City of Los Angeles

In order to guide future development around transit station areas throughout the City of Los Angeles, the City, in conjunction with the MTA, has developed a joint Land Use/Transportation Policy. As stated in the Policy, the creation of an integrated rail and bus transit system is a ~~has also created a unique, albeit~~ challenging~~,~~ opportunity to provide for growth and economic development, relieve ~~of~~ traffic congestion, and improve ~~the associated benefits to~~ air quality, and ~~to~~ provide a full range of housing opportunities in order ~~all intended~~ to improve the overall quality of life in Los Angeles.

The Land Use/Transportation Policy provides the framework to guide future development around transit station areas~~ such as those which would be developed as part of a joint development project subsequent to the completion of this project~~. This policy is not intended to be rigidly applied, but rather provides general objectives and principles to be used in the development of current and future Specific Plans which are, or will be, prepared for individual properties and areas of the City. The objectives of this Policy include the following:

- Protect and preserve existing single family neighborhoods.
- Focus future growth around transit stations.
- Increase land use intensity in transit station areas, where appropriate.
- Create a pedestrian oriented environment in context of an enhanced urban environment.
- Accommodate mixed commercial/residential use development.
- Provide for places of employment.
- Provide a wide variety of housing for a substantial portion of the projected Citywide population.
- Reduce reliance on the automobile.

The Land Use/Transportation Policy provides development guidelines for neighborhoods within a ½-mile distance of transit stations. These neighborhoods are defined by a Primary Influence Area of ¼-mile radius from the transfer station, and a Secondary Influence Area that serves as an area of transition and extends to a ½-mile radius from the transit station. Each station would require a unique planning process to evaluate what would be appropriate for the area in cooperation with the local residents.

It is necessary to recognize the individual characteristics and future potential of the city's neighborhoods, as well as address the concerns of local residents. To address this issue and to establish the basis for more detailed planning of transit station areas, the policy recognizes a set of six transit station area prototypes which establish a hierarchy of density ranging from a very dense urban area to a less dense, more suburban area. Based on the general characteristics of the proposed station areas, including the types and densities of land uses, it would appear that the most appropriate future development characteristics for the Pico/ or Venice/San Vicente Station site would be contained under the Neighborhood Center prototype. The character of the Olympic Stations sites would essentially remain unchanged.

However, while the Pico/ or Venice/San Vicente Station site ~~project~~ area may be considered as "most closely" possessing the characteristics of the Neighborhood Center, it could also be interpreted as having characteristics which closely resemble other station area prototypes such as the Urban Complexes, Major Bus Centers, and Regional/Suburban Centers. Ultimately, the type and density of future development throughout the proposed project area will be established in Community Plans and Specific Plans, both of which have been identified for all portions of the proposed project area, and through community input and participation.

General Plan Land Use Element

Due to the sheer size of the City of Los Angeles and the multitude of land uses therein, it is not practical to have one General Plan Land Use Element which covers the entire City. Instead, the Los Angeles City Planning Commission divided the City into 35 separate Community or District Plan Areas (hereafter referred to as Community Plans). Together, these 35 Community Plans make up the Land Use Element of the Comprehensive General Plan.

The overall purpose of the 35 Plans is to provide an official guide to the future development of each District, with the general intent being to "promote an arrangement of land uses, streets, and services which will encourage and contribute to the economic, social and physical health, safety and welfare and convenience of the people who live and work in [any of] the District[s]." To facilitate this, each Community Plan provides specific land use designations for every area within the District, thus establishing the framework to guide future development.

Of the 35 Community Plan Areas, the *Wilshire Community Plan* encompasses the majority of each of the ~~four~~ "build" ~~proposed project~~ alignments. Other Community Plans in and around the proposed project area include the *West Adams-Baldwin Hills-Leimert Community Plan* area which encompasses and abuts a relatively small segment of the southern portion of the four alternative ~~B~~ alignments ~~along Venice Boulevard~~ south of Pico Boulevard. The

South Central Los Angeles Community Plan also abuts the southeast corner of the project area near the intersection of Arlington Avenue and Pico Boulevard. Each of these Community Plans are discussed below, with the location of the four ~~proposed project~~ alternative alignments in relation to these Plan areas shown in Figure 7-19.

Wilshire Community Plan

The purpose of the *Wilshire Community Plan* is to provide a guide for the orderly and balanced development of the area, with the intent of preserving and enhancing the distinctive residential character of the Community; promoting economic well-being and public convenience; providing a circulation system coordinated with land uses and densities; and encouraging the expansion and improvement of public transportation service. Other objectives of the Plan which are relevant to the project include coordinating development of the Wilshire Community with other parts of the City such as the proposed Wilshire Center and Miracle Mile Specific Plan Areas, both of which are discussed later in this section under "Specific Plans."

Public improvement programs for circulation identified in the Wilshire Community Plan include, but are not limited to, encouraging and coordinating the improvement of existing public transportation systems, including mass transit; and promoting the use of public transportation through economic incentives and dissemination of information. The Wilshire Community Plan is currently being updated and is not anticipated to be ready for presentation to the Planning Commission until some time in 1999.

West Adams-Baldwin Hills-Leimert Community Plan

The *West Adams-Baldwin Hills-Leimert Community Plan* proposes to preserve the low density single-family residential areas; conserve open space areas; concentrate future development of commercial and residential uses into the Crenshaw Center; and to connect the Crenshaw Center with other major centers in the City via rapid transit. This Plan addresses numerous features related to the need for improved public transit systems which will be essential to relieving traffic congestion associated with projected growth and development throughout the District, particularly in the immediate vicinity of the Crenshaw Center.

While the Crenshaw Center is outside the area of influence for all proposed stations, the Venice/San Vicente and Pico/San Vicente Stations could provide a future connection to the proposed Crenshaw-Prairie Line that would extend to a proposed station in the Crenshaw Center, if that facility is constructed.

The *West Adams-Baldwin Hills-Leimert Community Plan* is currently undergoing revision by the City of Los Angeles Planning Department, and is scheduled for review and approval by the City Council during the spring/ summer of 1997.

South Central Los Angeles Community Plan

The overall purpose of the *South Central Los Angeles Community Plan* is to reverse overall negative economic trends in the area by encouraging public and private investment to revitalize declining areas. Since a high percentage of residents in this District are reliant on public transit, this Community Plan contains a public transportation policy to encourage and assist responsible agencies in "maintaining, improving and developing a public transportation system that will serve the transportation needs of the residents." It is also the City's policy to promote the revitalization of declining land uses in the District in conjunction with these transportation improvements.

The *South Central Los Angeles Community Plan* is currently under revision and is scheduled for review and approval before the City Planning Commission in the summer of 1997.

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FIGURE 7-19
COMMUNITY PLAN AREAS

General Plan Land Use Designations

The majority of the General Plan land use designations throughout the study area are established via the *Wilshire Community Plan* and generally consist of varying densities of single- and multiple-family residential uses in areas adjacent to primary arterial roadways, with a variety of commercial uses fronting onto those roadways~~(see Figure 7-20)~~. The land use designations specific to the four~~proposed~~ alignment alternatives, small amounts of which are also contained in the *West Adams-Baldwin Hills-Leimert* and *South Central Los Angeles Community Plans*, are displayed in Figures 7-20 and 7-20.1~~described below~~.

~~Similar to the previous discussions of existing land uses, General Plan land use designations are provided for an approximate one-block-wide swath along each side of a proposed alignment, and an approximate ½ mile (0.5 mile) radius around proposed station locations (station influence area). Land uses along each of the proposed alignments are discussed in the order which they would be encountered between the existing Wilshire/Western Station and the proposed terminus station near the intersection of Pico, Venice and San Vicente Boulevards. Land uses within the 0.5-mile radius of the proposed station locations are discussed separately.~~

~~Alternative A (Wilton/Arlington/Pico)~~

~~The land use designation along Wilshire Boulevard (which is designated as a major scenic highway), immediately west of the existing Wilshire/Western Station is Commercial (Regional Center). As the proposed alignment arcs toward the south paralleling Wilton Place, the west side of the street between Wilshire Boulevard and 8th Street is within the Park Mile Specific Plan (discussed below). The land use designation for the parcel at the southwest corner of the intersection at Wilton Place and Wilshire Boulevard is Commercial (Regional Center), with low density residential designations (5 to 7 dwelling units per acre (du/ac)) applied to the remaining properties down to 8th Street. The exception to this is the parcel on the northwest corner of Wilton Place and 8th Street which is identified as Public/Quasi-Public and as a Public Elementary School Site (Wilton Place Elementary).~~

~~Land use designations on the east side of Wilton Place include Commercial (Regional Center) at the corner of Wilshire Boulevard, and Medium (24 to 40 du/ac) to High Medium (40-60 du/ac) Density Residential down to 7th Street. The remainder of Wilton Place, including the east side from 7th Street, and the west side from 8th Street, to a point slightly north of Olympic Boulevard, is designated as Medium Density Residential (24-40 du/ac). Land use designations for all properties fronting the intersection at Wilton Place and Olympic Boulevard are identified as Highway Oriented Commercial.~~

~~As the proposed alignment continues south from Olympic Boulevard along Arlington Avenue, land use designations are Low Density Residential (5 to 7 du/ac) on both sides of the street to Country Club Drive. Between Country Club Drive and 12th Street, the east side of Arlington Avenue is designated as Low Density Residential (3 to 7 du/ac), with the west side designated as Public/Quasi-Public (churches). The remainder of Arlington Avenue to Pico Boulevard is designated as Low Density Residential (3 to 7 du/ac).~~

~~As the proposed alignment arcs to the west and begins within the right-of-way of Pico Boulevard, the majority of the properties along the north side of Pico Boulevard to Crenshaw Boulevard are designated as Commercial (Neighborhood & Office). The north side of Pico Boulevard between Crenshaw Boulevard and Queen Anne Place is designated as Highway Oriented Commercial. The remainder of the north side of Pico Boulevard between Queen Anne Place and San Vicente Boulevard is designated as Commercial (Neighborhood & Office). Land use designations for properties immediately north of the commercially designated areas along Pico Boulevard include a variety of Multi-family residential designations ranging from Low (5 to 7 du/ac) to Medium (24 to 40 du/ac) Densities.~~

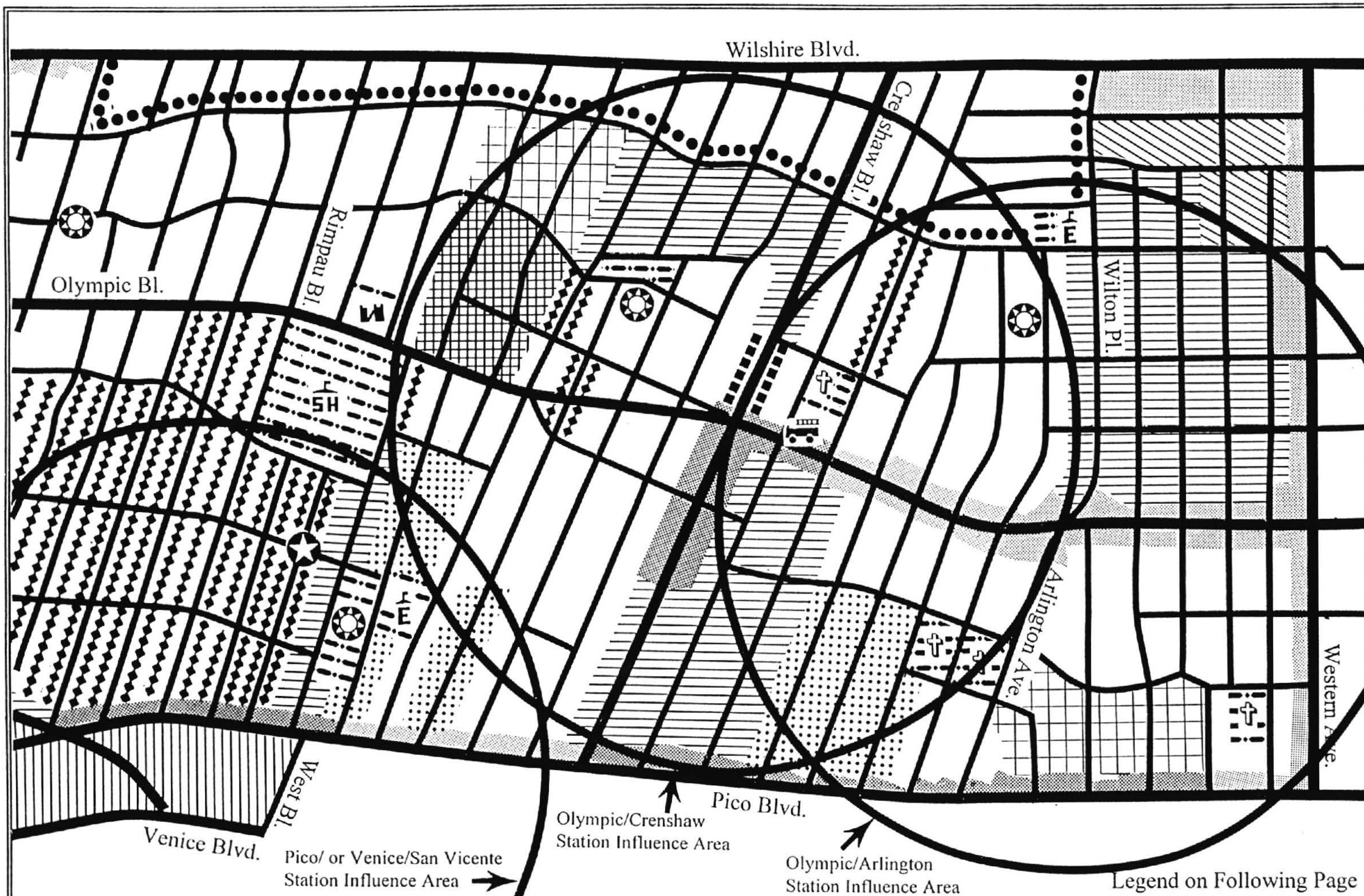

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FIGURE 7-20
WILSHIRE COMMUNITY PLAN

Land Use Legend			
Residential	Zones	Commercial	Zones
Very Low II	RE15, RE11	Limited	CR, C1, C1.5, P
Low I	RE9	Highway Oriented	CR, C1, C1.5, C2, P
Low II	R1, RS, RD6	Neighborhood & Office	CR, C1, C1.5, C2, C4, P
Multi-Family		Community	C2, C4, CR, P, PB
Low Medium I	R2, RD5, RD4, RD3	Open Space, Public	
Low Medium II	RD2, RD1.5	Open Space	
Medium	R3	Elementary School	
High Medium	R4	Senior High School	
Other Facilities		Neighborhood Park	
Church		Community Park	
Mile Park Specific Plan Boundary		Fire Station	
		Community Library	

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FIGURE 7-20 (CONT.)
WILSHIRE COMMUNITY PLAN

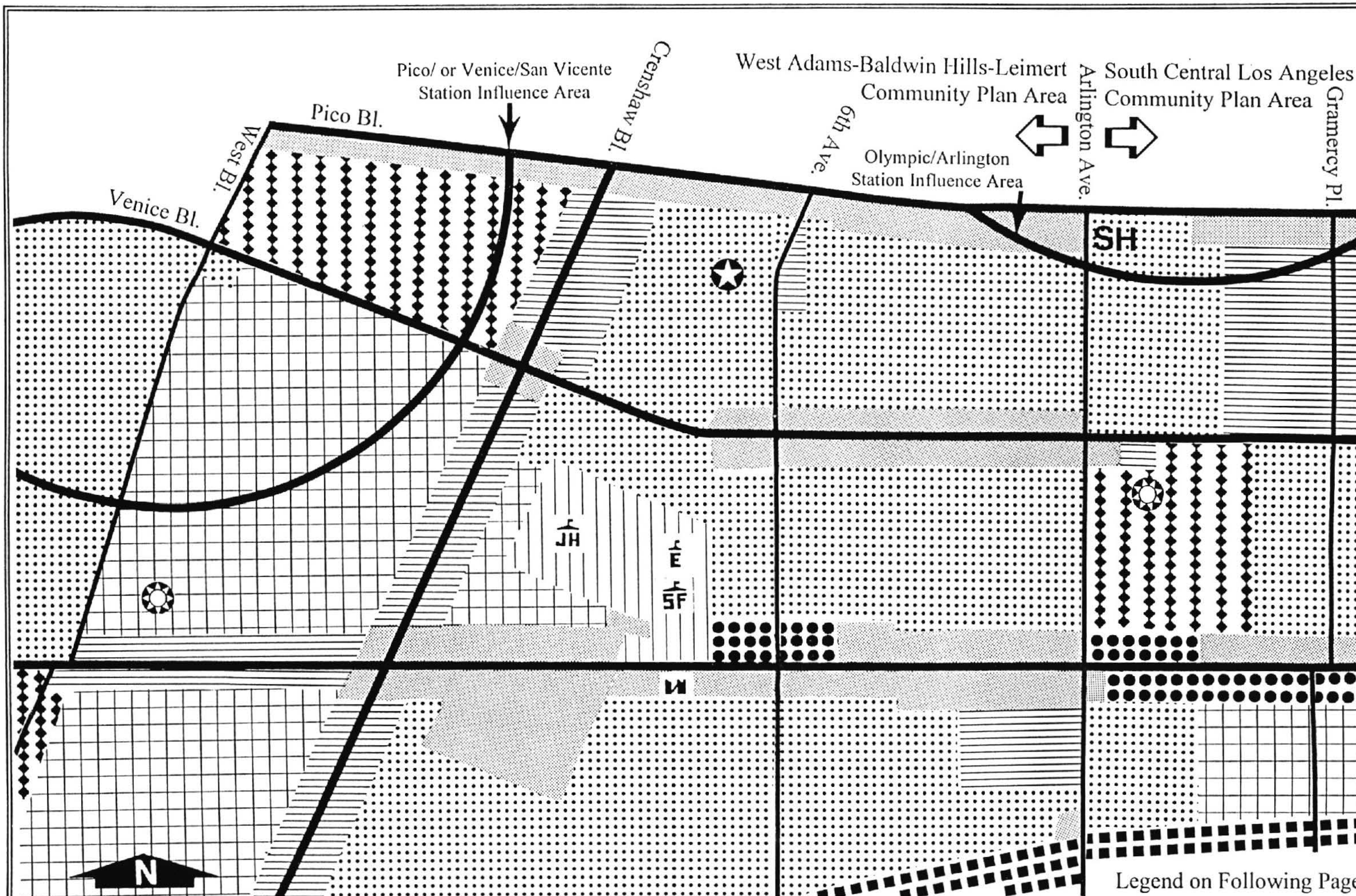

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FIGURE 7-20.1
WEST ADAMS-BALDWIN HILLS-LIEMERT AND SOUTH CENTRAL LOS ANGELES COMMUNITY PLANS

Land Use Legend					
Residential		Zones	Commercial		Zones
	Low	R1, RD6		Highway Oriented	C1, C2, CR, P
Multi-Family			Industrial		
	Low Medium I	R2, RD3, RD4, RD5		Commercial Manufacturing	CM, P
	Low Medium II	RD2, RD 1.5	Open Space, Public/Quasi-Public		
	Medium	R3		Open Space	
Schools				Public/Quasi-Public	
E	Elementary		Other Facilities		
JH	Junior High			Community Library	
SF	Special Facility			Neighborhood Park	
SH	Private School			Community Park	

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FIGURE 7-20.1(CONT.)
WEST ADAMS-BALDWIN HILLS-LIEMERT AND SOUTH CENTRAL LOS ANGELES COMMUNITY PLANS

~~Most of the property located south of Pico Boulevard is included in the *West Adams-Baldwin Hills-Leimert Community Plan*, the exception being a small portion of land between West and San Vicente Boulevards which is designated as Commercial (Community) in the *Wilshire Community Plan*. Land use designations south of Pico Boulevard generally mirror the designations established in the *Wilshire Community Plan*, those being Commercial (Neighborhood & Office) between Arlington Avenue and Crenshaw Boulevard, Highway Oriented Commercial between Crenshaw and West Boulevards, with Low Medium (7 to 12 du/ac) to Medium Density Residential (24 to 40 du/ac) uses located south of and adjacent to commercially designated areas along Pico Boulevard.~~

~~Alternative B (Wilton/Arlington/Venice)~~

~~Designated land uses along this proposed alignment are identical as those described under Alternative A, up to the point where Alternative A begins a westerly arc north of Pico Boulevard. As discussed under Existing Land Use, the proposed Alternative B alignment continues in a southerly direction through the intersection of Arlington Avenue and Pico Boulevard, into the *West Adams-Baldwin Hills-Leimert Community Plan* area. Land use designations for properties fronting onto the intersection at Pico Boulevard and Arlington Avenue are all Commercial (Neighborhood & Office), except for the southeast corner which is designated as Low Medium Density (12 to 24 du/ac) Multi-family Residential in the *South Central Los Angeles Community Plan*.~~

~~At this point, the Alternative B alignment begins a broad sweeping arc to the west, through an area designated as Low Medium Density (12 to 24 du/ac) Multi-family Residential, to a point near the intersection of Norton Avenue and Venice Boulevard. At this point, the Alternative B alignment proceeds in a westerly direction within the Venice Boulevard right-of-way. Land use designations along this stretch of Venice Boulevard include Highway Oriented Commercial between Arlington Avenue and 7th Street, Low Medium Density (12 to 24 du/ac) Multi-family Residential between 7th Street and Crenshaw Boulevard, and Highway Oriented Commercial at the intersection of Crenshaw and Venice Boulevards. The remaining land use designations for properties along Venice Boulevard to San Vicente Boulevard include Low Density (3 to 7 du/ac) Residential and Low-Medium Density (12 to 24 du/ac) Multi-family Residential.~~

~~Alternative C (Crenshaw/Pico)~~

~~As mentioned under Existing Land Use, this proposed alignment does not arc to the south along Wilton Place as do Alternatives A and B, but continues west along Wilshire Boulevard through the *Park Mile Specific Plan* area which begins at Wilton Place and continues west to Highland Avenue. There are no specific General Plan land use designations in this area, other than *Park Mile Specific Plan* area. Land uses proposed within this Specific Plan area are addressed below under the section titled "Specific Plans."~~

~~At a point near the intersection of Wilshire Boulevard and Bronson Avenue, the proposed alignment arcs to the south down to 8th Street, still within the *Park Mile Specific Plan* area. Land use designations in this area of the Specific Plan are for multiple dwellings with a maximum density of 7-12 du/ac. As the alignment continues south from 8th Street, land use designations on both sides of Crenshaw Boulevard include Medium Density (24 to 40 du/ac) Multi-Family Residential between 8th Street and 9th Street; Limited Commercial between 9th Street and Olympic Boulevard; Commercial (Neighborhood & Office) from approximately half way between Olympic and Pico Boulevards; and Medium Density (24 to 40 du/ac) Multi-family Residential for the remainder of the property down to Pico Boulevard.~~

~~From Pico Boulevard west to the proposed Pico/San Vicente Station, land use designations are identical to those described for Alternative A.~~

Station Influence Areas

The following discussions identify the (General Plan) land use designations for the 0.5-mile radius surrounding proposed station locations.

Olympic/Arlington Station (Alternatives A and B)

The site for the Olympic/Arlington Station is designated Highway Oriented Commercial and Medium Density Residential. East of Wilton Place/Arlington Avenue planned land uses are primarily Medium and High Medium Multiple Family Residential. Low Density Residential occurs between Olympic and Pico Boulevards. Highway Oriented Commercial land uses are designated along Western Avenue and Olympic Boulevard. The majority of land use along Olympic Boulevard is designated for a variety of commercial uses.

Olympic/Crenshaw Station (Alternative C)

Planned land use for the Olympic/Crenshaw Station site is primarily Neighborhood and Office Commercial, with Limited Commercial, Low Density Residential (5 to 7 du/ac) and Medium Density (24 to 40 du/ac) Multi-family Residential immediately surrounding the intersection. Within the influence area of this station, planned land use designations are primarily low and medium density residential (5 to 40 du/ac). Along Crenshaw Boulevard there is a corridor of Neighborhood and Office Commercial that extends south of Olympic Boulevard to just south of Country Club Drive, with a corridor of Highway Oriented Commercial extending east along Olympic Boulevard from Crenshaw Boulevard. A corridor of Limited Commercial extends north from Olympic Boulevard to 9th Street.

Pico/ or Venice/San Vicente Station (All Alternatives)

The Pico/San Vicente and Venice/San Vicente Stations are located approximately 200 feet apart and therefore encompass approximately the same station influence area. Both of these proposed station sites are designated as Community Commercial. Planned land uses north of Pico Boulevard are primarily Medium Density (24 to 40 du/ac) Multi-Family Residential. The majority of planned land uses south of Pico Boulevard are within the West Adams-Baldwin Hills-Leimert and South Central Los Angeles Community Plan Areas, and include Community Commercial, Highway Oriented Commercial, and Low to Medium Density Residential (5 to 40 du/ac).

Several proposed revisions to the West Adams-Baldwin Hills-Leimert Community Plan would change some properties within this station influence area. This would include various parcels located south of Venice Boulevard and east of West Boulevard. Current General Plan designations are Low and Restricted Density Multi-family (3-7 dwelling units per acre) and are proposed to be changed to Low to Medium Residential (12-24 dwelling units per acre).

Specific Plans

While dividing the City into 35 separate Planning Districts allows for a more efficient and effective approach to guiding future development throughout the City, land use designations contained in community plans discussed above are still general in nature. Zoning codes are the city's tool which describe the designated allowable and prohibited land uses within a certain area (General Plan land use designations), including the height and size of buildings, architectural design, landscaping requirements, etc..

To further facilitate future planning and development within each Community Plan Area, Specific Plans are developed which provide a more detailed approach in guiding the future development of a smaller and more manageable portions of an area. These Specific Plans outline in detail, similar to zoning codes, permitted and prohibited land uses within the designated area, and establish detailed development standards which are either consistent with, or supersede established zoning codes. In summary, community plans serve as General Plan-level documents, while Specific Plans provide the detailed zoning standards.

Each of the previously discussed community plans produced by the City of Los Angeles Planning Department provide a list of Specific Plans which have either been approved as part of the Community Plan, or which are recommended for future study when authorized by the City Council.

Within the *Wilshire Community Plan* Area there are eight potential Specific Plan areas identified. At the time this document was being prepared, only one of those Specific Plans had been developed and approved, that being the *Park Mile Specific Plan* discussed below. The *West Adams-Baldwin Hills-Leimert Community Plan* identified the Crenshaw Corridor Specific Plan (discussed below) as the only one which was in any way related to the proposed project. The *South Central Los Angeles Community Plan* did not identify any approved or proposed Specific Plan Areas or study areas which would be expected to affect, or be affected by, the proposed project.

Park Mile Specific Plan

The *Park Mile Specific Plan* covers an approximate one block-wide area along each side of Wilshire Boulevard between Wilton Place and Highland Avenue. The existing Wilshire/Western Station is located immediately east of this Specific Plan area, however, portions of each of the proposed alternatives, specifically the proposed alignment segments along Wilshire Boulevard and south to 8th Street (all alternatives) are located within it. The *Park Mile Specific Plan* is also within the station influence area of the proposed Olympic/Arlington (Alternatives A and B) and Olympic/Crenshaw (Alternative C) Stations.

The general purpose of the detailed development standards contained in this Specific Plan is to "protect the low density, single-family residential nature of the area and to promote only that development which is compatible with adjoining residential neighborhoods..." It is also the intent of this Specific Plan to promote a park-like environment by limiting the intensity of development, and by providing extensive landscaping where appropriate.

The Specific Plan applies a zoning designation of CR(PkM)-1 (Modified Limited Commercial Zone, Park Mile, Height District 1), a commercial zoning designation specifically for properties fronting on Wilshire Boulevard within the *Park Mile Specific Plan* area. This zone permits a variety of the uses permitted in the conventional CR zone including professional office, parking, school (up to high school), and certain residential uses. Additional uses such as an auditorium or public service uses may be allowed pursuant to the issuance of a conditional use permit.

In most cases, any new structure to be built in the CR(PkM)-1 Zone would be limited to six stories (72 feet) in height, and would not be able to exceed a floor-area-ratio (FAR) of three to one (FAR 3:1). This means that the total square footage of any new structure could not exceed three times the amount of total buildable square footage of a given property. For example, for a parcel of land that has 1,000 square feet of buildable area, the maximum size of a building that could be built on that lot would be 3,000 square feet.

Other zoning designations established under the *Park Mile Specific Plan* include a variety of residential uses which have varying density and height restrictions. In most areas of the Specific Plan, residential structures are limited to three stories (45 feet), the exception being in areas zoned CR(PkM) in which structures up to 72 feet may be allowed. Depending on the area, the density of residential development can be either one unit per 1,000 square feet, or 1 unit per 2,000 square feet of lot area. Most of the residentially-zoned properties are focussed in the areas immediately north and south of commercially zoned areas along Wilshire Boulevard, as well as along Wilton Place.

The *Park Mile Specific Plan* Map is shown in Figure 7-20.2.

Specific Plan Study Areas

Other Specific Plan study areas which could affect, or be affected by, the proposed project have been proposed, but not yet developed or authorized. These study areas include the following:

- *Wilshire Center Study Area* which is comprised of various interrelated commercial office, shopping, residential, and cultural activities, envisions the use of pedestrian open spaces, plazas and overpasses; a secondary people-mover; and multiple uses of major structures such as for residential, commercial and parking uses. This proposed study area would encompass the immediate area surrounding the existing Wilshire/Western Station (all alignment alternatives), and northern portions of alternatives A and B.

- *Miracle Mile Center Study Area* which envisions continued "high quality" development which takes into account the mixing of residential and commercial areas, including vehicular and pedestrian circulation. This center is located west of and beyond the proposed project area.

- *Freemont Place Study Area* which envisions the conversion of the existing residential areas into a center for foreign consulates, museums, theaters, schools or other institutional uses which could utilize, thus preserve many of the existing large, unique residential structures. This area is located west of the proposed project area, within the Olympic/Crenshaw Station influence area.

- *Unnamed Study Area* which would be located east of the proposed project area east of Western Avenue between 8th Street and 13th Street, thence easterly to Vermont Avenue. This Specific Plan would be within the eastern portion of the proposed Olympic/Arlington Station influence area. This proposed study area envisions strong emphasis on the unique ethnic character of the area (Korean-American) and should be developed to meet the specific needs and potentials of the local population.

Redevelopment Plan for the Mid-City Recovery Development Project

In response to direction by the City Council of the City of Los Angeles, the City of Los Angeles Community Redevelopment Agency (CRA) has begun planning revitalization and recovery efforts for areas affected by the April 29, 1992 civil unrest. The Mid-City Recovery Area is one of eight priority areas identified by the City Council. It is generally bounded by Pico Boulevard to the north, Western Avenue to the east, Jefferson Boulevard to the south, and Fairfax Avenue to the west. This area includes the proposed Pico/San Vicente and Venice/San Vicente Stations site.

There are numerous objectives of this Redevelopment Plan, with the general intent being to stimulate positive community changes through reinvestment in predominantly commercial and industrial corridors within the greater Mid-City area. One objective which directly relates to the proposed project is to "...encourage a circulation system which will improve the quality of life in the Project Area, including...mass transit systems... with emphasis on serving seniors and the disabled." The CRA adopted the Redevelopment Plan in May 1996.

Redevelopment Plan for the Wilshire Center/Koreatown Recovery Redevelopment Project

This project is also the result of a motion by the Los Angeles City Council which directed the Los Angeles Community Redevelopment Agency to initiate recovery and revitalization efforts in areas of the City affected by the civil unrest which occurred in April 1992. The intent of this project is to "continue upgrading the physical and

ULTRASYSTEMS
ENVIRONMENTAL
INCORPORATED

FIGURE 7-20.2
PARK MILE SPECIFIC PLAN MAP

economic environment of the Wilshire Center and Koreatown communities through new development and rehabilitation."

This redevelopment project area is within the *Wilshire Community Plan* area, with its western border generally running along Western Avenue between 5th Street and 11th Street. A small portion of the project area extends to the west to Wilton Place, between 5th Street and 7th Street, thus encompassing the existing Wilshire/Western Station.

There are numerous objectives of this redevelopment project, several of which are directly related to the proposed project. These include the promotion of the economic well-being of the area through revitalization of residential, commercial, and industrial areas, with specific focus on the unique character of the area, specifically the ethno-cultural aspects. The plan also calls for the provision of an efficient circulation system, including the encouragement of improved public transit services.

<u>SCAG Regional Comprehensive Plan and Guide</u>

The 1995 Southern California Association of Governments (SCAG) Regional Comprehensive Plan and Guide (RCP) contains some references which may be relevant to the proposed project. In their "Policies Related to the Regional Comprehensive Plan and Guide to Maintain the Regional Quality of Life," SCAG shall:

- ~~"Support local plans to increase density of future development located at strategic points along the regional commuter rail, transit systems and activity centers;~~

- Support local jurisdictions strategies to establish mixed-use clusters and other transit oriented developments around transit stations and along transit corridors; and

- Encourage developments in and around activity centers, transportation corridors, under-utilized infrastructure systems and areas needing recycling and redevelopment."

The proposed Metro Red Line extension is identified in Figure 4-4 of the RCP as a proposed urban rail line.

7.4.2 <u>Project Impacts</u>

<u>Overview</u>

As discussed under Existing Conditions, the amount of area to be evaluated in terms of potential impacts includes an approximate one-block-wide area along each side of a proposed alternative, and an approximate ½ mile radius around proposed station locations.

Potential land use impacts that could occur would be associated with acquisition of property, disruption of businesses, and construction-related impacts such as noise, vibration, air quality (dust), and traffic/circulation impacts. Operational impacts may also result in the generation of noise and vibration to adjacent land uses, and the continuing maintenance of vacant land.

For specific discussions related to some of the above-mentioned issues, refer to the following sections of this document: property acquisitions and displacement (7.6.2); disruption of businesses (7.7.2); noise and vibration (7.11.2); air quality (7.12.2); and traffic/circulation impacts (7.2.2).

In general, most potentially significant land use-related impacts would be associated with the following:

- Acquisition and demolition of existing structures in and around any of the proposed alternatives, and the effects on existing adjacent land uses that would remain;

- The maintenance of vacant land following construction and potential future resale and/or development of these vacant properties;

- Consistency of the proposed project with various local, district and regional plans and land use policies which have been established throughout the proposed project area; and

- Compatibility with existing land uses.

Thresholds of Significance Criteria

For purposes of this assessment, the following criteria have also been established as benchmarks against which the potential significance of land use impacts can be judged.

Acquisition and Demolition of Existing Structures

- Acquisition and demolition of existing structures would result in the creation of areas which promote or otherwise accommodate illegal and/or illicit activities which could adversely affect existing, adjacent land uses.

- Acquisition and demolition of existing structures would create or exacerbate blighting influences or security problems for existing land uses adjacent to the proposed alignment and stations, where vacant buildings or lots created by the project are not maintained in terms of trash and graffiti removal, or are not properly fenced and screened.

Maintenance of Vacant Land

- Maintenance of vacant land created through acquisition and subsequent remnant parcels would create or exacerbate blighting influences for existing land uses adjacent to the proposed alignment and stations, where illegal dumping and litter accumulates, graffiti and loitering occur, and vegetation overgrowth occurs.

Compatibility and Consistency with Adopted Plans and Policies

- Based on Appendix G of the State CEQA Guidelines (Significant Effects), land use-related impacts associated with a project would normally be considered significant if they were not compatible or consistent with adopted local and regional plans and policies of the community where it is located.

Acquisition and Demolition of Existing Structures

A separate section of this SEIS/SEIR has been prepared which discusses property acquisition and subsequent demolition issues in detail (see Section 7.6 - Property Acquisition and Displacement). Additionally, potential impacts to remaining commercial uses associated with the temporary loss of, or impediment to site access, are discussed in detail in Section 7.7 (Business Disruption During Construction). Furthermore, issues associated with temporary impediments to residential access during the removal/replacement of utilities are discussed in Section 7.13 (Utilities).

Of primary importance in terms of land use impacts are the potential adverse effects that acquisition and demolition of buildings would have on existing adjacent land uses that would remain. Specifically, there would be concern for remaining commercial and residential uses which abut condemned structures, and the propensity for vacant structures to be trespassed for illicit and/or illegal use (i.e.: drug dealing, use by the homeless and/or gangs, loitering, etc.). These potential impacts are discussed below for each project alternative.

No Project Alternative

Under the No Project Alternative, substantial acquisition and demolition of existing structures would not necessarily occur, nor would the potential impacts associated with those activities. Overall, while some demolition could occur in the project area, it would probably occur on a project-by-project basis, and would not likely occur to the extent that would be anticipated under any of the other project alternatives.

Alternative A (Wilton/Arlington/Pico)

Approval of Alternative A would result in the acquisition and subsequent demolition of a number of ~~numerous~~ structures located in the immediate areas surrounding the proposed Olympic/Arlington and Pico/San Vicente Stations locations. These are listed in Table 7-30 (Estimated Number of Property Acquisitions and Displacements by Alternatives).

For the Olympic/Arlington Station, approximately 7 lots ~~properties~~ would be acquired for use as construction material storage, ~~and~~ equipment staging areas, construction offices, and for the station entrance area. All of these properties are located at the southwest corner of the intersection at Olympic Boulevard and Arlington Avenue and consist of commercial, office, and residential uses. Existing structures that would be demolished include 3 commercial buildings, one commercial parking lot, and one single-family residence. The two southernmost single-family residences that would be acquired (one on Arlington Avenue and one on Westchester Place) would not be demolished; instead they would be used as construction offices. They would be resold after construction is complete. This would help preserve the fabric of the neighborhood. Remaining land uses adjacent to this area would include the commercial and office uses at the northwest corner of the intersection of Olympic Boulevard and Arlington Avenue, commercial and residential uses located to the east across Arlington Avenue, single-family residences south of the site, and single-family residences which front onto Westchester Place directly west of the site.

To make way for planned improvements for the proposed Pico/San Vicente Station, approximately 14 buildings would be acquired in the vicinity of the area where Venice, Pico and San Vicente Boulevards converge. The acquisition would include three multi-family residential buildings containing 41 rentable units, nine commercial/ retail buildings (one of the nine commercial buildings has four residential apartments on the second floor), one church (in a commercial building), the Pico/Rimpau Transit Center (already owned by the MTA), and the Eleanor Green Roberts Aquatic Center. In addition, four vacant lots and one parking lot, all of which are located west of West Boulevard between Venice, San Vicente, and Pico Boulevards would be acquired. Adjacent land uses to remain in this area would include commercial and retail establishments located north of the site across Pico Boulevard, residential uses located east of the site across West Boulevard, residential uses located south of the site across Venice Boulevard, and commercial uses located west of the site across San Vicente Boulevard. In addition, one commercial building would be acquired on the southeast corner of Pico and West Boulevards in order to relocate the existing storm drain.

All of the remaining properties mentioned above could experience negative effects if illicit and/or illegal activities were allowed to occur in structures that have been acquired and vacated, but not yet demolished. This would particularly be the case for the remaining residential units located immediately adjacent to the land to be acquired.

While the remaining land uses located across major boulevards such as those north of Wilshire, west of Crenshaw, north of Pico, south of Venice, east of Arlington, and east of Wilton would not likely be affected as directly as the uses located immediately adjacent to vacant structures, it is understandable that existing shop owners/operators and residents would have concerns for their own safety and security.

Potential negative effects would be associated with the creation of nuisances, those being vacant structures which could be accessed by the homeless, gangs, criminals and/or juvenile delinquents. The types of activities that could reasonably be anticipated to occur include, but are not necessarily limited to, vandalism to adjacent uses such as graffiti and other property damage, property theft and burglaries, drug dealing, the creation of fire hazards, and other crimes associated with the presence of individuals which could use vacant structures ~~as drug distribution points, or~~ for ~~other~~ illicit/illegal activities.

While standard procedures such as boarding up access points and installing fencing around the property may deter some potential trespassers, previous experience has shown that these measures are usually not entirely effective without maintenance and security. The most effective way to avoid these potential impacts would be to proceed with the demolition of acquired structures as soon as it is practical to do so, thus removing the opportunity for illicit/illegal activities to be established. Enhanced security and on-going maintenance would also be helpful.

Alternative B (Wilton/Arlington/Venice)

Impacts associated with station locations would be the same as discussed under Alternative A, the exception being that under Alternative B, the existing Eleanor Green Roberts Aquatic Center and the commercial building on the southeast corner of Pico and West Boulevards would not be acquired and demolished. While the existing Pico/ Rimpau Transit Center would remain in service during the initial phases of project construction, it would eventually become ~~could be~~ necessary to demolish it and relocate the facility to a different portion of the site or to another off-site location. This would be determined during final design of the proposed station and associated parking structure. It is anticipated that the Aquatic Center would also remain in operation throughout project construction.

The overall potential impacts of Alternative B are essentially the same as described for Alternative A, the exception being that the potential use of abandoned structures for illicit and/or illegal activities could affect the operation of the Eleanor Green Aquatic Center which is located in the immediate vicinity of those structures. However, the presence of substantial numbers of people in those facilities could also deter persons from utilizing abandoned structures for illicit/illegal activities.

Alternative C (Crenshaw/Pico)

Approval of Alternative C would result in the acquisition and subsequent demolition of the highest number of properties and structures of all "build" ~~the proposed project~~ alternatives. ~~Acquisitions for the Olympic/Crenshaw Station would be required~~ To provide station entrances at the northeastern and southwestern corners of the Olympic/Crenshaw intersection for the Olympic/Crenshaw Station five commercial buildings housing eleven businesses would have to be acquired. The acquisition of property bounded by Pico, San Vicente, West, and Venice Boulevards, as described above for Alternative A, would be required for construction of the Pico/San Vicente Station. An additional property on the southeast corner of Pico and West Boulevards would be required to relocate a storm drain.

A construction staging area would be located at the southweste~~rn~~ corner of Wilshire and Crenshaw Boulevards in the vicinity of the existing MTA parking lot. To make room for this construction work area, all of the properties on the west side of Crenshaw Boulevard between Wilshire Boulevard and 8th Street would be acquired. The properties that would be acquired include: nine single-family residences, eight multi-family buildings containing 39 units, one commercial building, and one church building.

Due to the shallow tunneling used for this alternative within Crenshaw Boulevard, some underground utility lines (sewer lines and storm drains) would need to be relocated. Private property in the project vicinity would be acquired for the relocation and construction of these utility facilities. The locations of these properties are shown in Figures 7-38 and 7-39. In total, utility relocations would acquire and demolish: 15 single-family residences, one multi-family building with five units, and three commercial buildings housing five businesses.

Single properties on the southwest corner of Wilshire Boulevard and Norton Avenue and on the northwest corner of Pico Boulevard and Victoria Avenue would be acquired to construct ventilation shafts for the subway tunnel segments. The Wilshire/Norton property is vacant, but there is one commercial building on the Pico/Victoria property that would have to be demolished. The exact locations of the vent structures are subject to change during final design.

Remaining land uses would include substantial numbers of both residential uses (single- and multi-family) and commercial uses. Due to the higher number of vacant structures that would be clustered in close proximity to one another, the propensity for some of the vacant structures to be used for illicit and/or illegal activities would be higher.

Maintenance of Vacant Land

Primary concerns associated with vacant land created for project construction, including sites that would remain vacant following project construction, would be related to the potential for those properties to fall into disrepair, thus creating or exacerbating blighting influences in the area. These conditions could be created if vacant sites become overgrown with grasses and weeds, or if they become convenient sites for the dumping of trash and litter, particularly larger items such as used furniture, appliances and/or construction debris. Additionally, some sites may have existing or new walls which could become attractive targets for graffiti, and some sites may be conducive to loitering.

Conditions such as these can result in direct adverse impacts to adjacent uses, and can contribute to the overall decline in the attractiveness of the neighborhood or commercial area in which it is located. This in turn could add to continuing and/or increased blight in the general vicinity, thus detracting from the potential for future investment in the area, and therefore hampering the overall economic revitalization efforts of the community.

Discussions below identify the amount of vacant land that would be created for project construction, and the amount of property that would remain vacant following completion of construction.

No Project Alternative

Under the No Project Alternative, there would be no properties cleared for project construction, and no new vacant properties would be created in association with the proposed project. Overall, there would be no substantial changes in the amount of vacant land, therefore no impacts on existing land uses.

Alternative A (Wilton/Arlington/Pico)

Under Alternative A, construction of the proposed stations would result in the acquisition and clearance of an estimated 5 properties for the Olympic/Arlington Station, and an estimated 14 properties for the Pico/San Vicente Station. In addition, one commercial building would be acquired and demolished on the southeast corner of Pico and West Boulevards in order to relocate the existing storm drain. Property cleared to make way for the construction of proposed project-related facilities would generally be developed as soon as possible following construction and therefore, would not contribute to blighted conditions in the area.

This would not necessarily be the case for the land cleared, but not proposed for development of project-related facilities or other uses following the completion of project construction. Therefore, the potential exists for property acquired for construction staging areas and other construction uses to remain vacant for an extended period of time, thus increasing the potential to ~~fall into disrepair and create, or~~ exacerbate blighting influences in the area.

Overall, while vacant properties have the potential to create or exacerbate blighting influences in the project area, implementation of proposed mitigation measures would reduce that potential impact to less than significant levels.

Alternative B (Wilton/Arlington/Venice)

Under Alternative B, the potential impacts at the Olympic/Arlington Station site would be the same as described above for Alternative A. At the Venice/San Vicente Station site, an estimated 11 properties would be acquired, and demolished. The Eleanor Green Roberts Aquatic Center would be retained on-site in its existing condition, and the 2 commercial buildings on the southeast corner of Pico and West Boulevards would not be acquired. The property that would not be developed with transit uses would be developed in cooperation with the private sector and consistent with neighborhood plans and zoning ~~retained by the MTA, and their Joint Development Group would seek to develop it in the future~~.

Regardless, implementation of proposed mitigation measures would ensure that all land remaining vacant following project construction would be properly maintained ~~to avoid the potential for falling into disrepair or misuse~~.

Alternative C (Crenshaw/Pico)

Under Alternative C, an estimated 19 properties on the west side of Crenshaw Boulevard between Wilshire Boulevard and 8th Street would be acquired and cleared for use as a construction staging area. After project completion, this property would either be sold outright or developed in cooperation with the private sector and consistent with neighborhood plans and zoning ~~joint developed with private developers and the MTA~~.

No vacant land would remain after development of the Olympic/Crenshaw Station site. Development of the Pico/San Vicente Station would result in unused property remaining vacant around the station site. The property that would not be developed with transit uses would be retained by the MTA, and developed in cooperation with the private sector and consistent with neighborhood plans and zoning ~~their Joint Development Group would seek to develop it in the future~~.

The property on the southeast corner of Pico and West Boulevards that would be required for relocating the storm drain, and all other properties acquired for relocating utility facilities, would be cleared of all structures resulting in vacant properties after the construction is complete. As was described for the other project alternatives above, if vacant sites are not properly fenced and maintained prior to final disposition, these areas could have adverse effects on adjacent properties by attracting trash, graffiti, and loitering, thereby creating or exacerbating blighting influences in the area. Since Alternative C would result in a higher number of property acquisitions, the potential for illicit or illegal vacant site use would be greater than with Alternatives A, B1 and B2. These properties, after construction completion, would be developed in cooperation with the private sector and consistent with neighborhood plans and zoning.

Implementation of the proposed mitigation measures would reduce that potential impact to less than significant levels.

Compatibility and Consistency with Adopted Plans and Policies

In virtually all of the plans and reports discussed under the Environmental Setting, there is a central theme which surfaces, that being the need to move the City in a direction which encourages the development and use of public transportation systems to connect the various districts within the City, thus helping to relieve traffic congestion, reduce air pollution, and better serve the needs of the citizens of Los Angeles. Transit corridors serve as the backbone to this process. The proposed project represents another link in the Los Angeles Rail Rapid Transit Project, commonly referred to as Metro Rail. This system is referenced in virtually all plans which are applicable to the project area and surrounding communities.

Virtually all of the plans reviewed encourage the development of an efficient and effective public transit system which interlinks various areas of the City, thus facilitating the long-range planning of activity centers, growth districts, and the accompanying land uses. As evidence to the importance of transit facilities in relation to future growth and development in the City, the Land Use chapter of the General Plan Framework Element includes the allowance for flexibility in land use boundaries to accommodate new transit routes and stations, thus avoiding inconsistencies between transit facilities and existing and/or future plans of an area.

Discussions provided in the following paragraphs discuss the consistency of the proposed project alternatives with the numerous citywide plans and policies which are specific to, or otherwise applicable to the proposed project area.

No Project Alternative

Under the No Project Alternative, none of the proposed transit facilities would be constructed. As a result, none of the transit-related goals, plans and/or policies applicable to the proposed project which are contained in any of the plans discussed under the Existing Setting would be implemented in the foreseeable future. This would include, but not be limited to, the general desire to develop a mass transit system to better serve the needs of area residents; to link neighborhoods and residents ~~land uses~~ in the project area with employment, educational, service, and entertainment ~~other growth/activity~~ centers throughout the City~~; and to provide the facilities necessary to accommodate increased densities of new development in areas surrounding transit facilities~~.

Furthermore, approval of the No Project Alternative would not result in the development of the transit facilities identified as being necessary to assist in attracting future investment, thus economic revitalization of under-utilized areas.

Alternative A (Wilton/Arlington/Pico)

General Plan

As discussed previously, General Plan elements applicable to the proposed project include the Citywide Framework Element, Land Use Element, and Circulation Element, each of which contain goals, policies and objectives that could affect, or be affected by the proposed project.

- Citywide General Plan Framework Element

The proposed project would result in the development of transit facilities consistent with the primary intent of maintaining single-family neighborhoods while encouraging the development of a mix of new commercial, office, and entertainment uses in relatively close proximity to transit corridors and stations (rail and bus).~~ While the proposed project does not specifically call for or involve the designation of land uses, it does establish the transit station locations which allow for the designation of appropriate land uses at appropriate densities to encourage activity near transit stations, a goal of nearly all of the Community Plans or Specific Plans discussed earlier.~~ The MTA is not proposing any General Plan or zone changes to increase the development potential of the area.

- Land Use Chapter

The location of the proposed station locations in close proximity to residential areas, many of which are reliant on public transportation, is consistent with policies of this Chapter which call for the MTA to promote pedestrian activity, and to provide bicycle and vehicular parking at, and in the vicinity of, transit stations. Parking ~~These~~ facilities would be provided at the western terminus of the proposed project only.

The Long Range Land Use Diagram for the Metro area of the City also identifies each of the proposed station locations under any of the project alternatives as being located in areas which fulfill the need for transit facilities which connect neighborhoods and communities with other regional and downtown centers via public transportation.

- Transportation Chapter

The proposed project is consistent with the Transportation Chapter of the Framework Element which seeks to achieve long-term mobility within the City through a multi-modal transportation system. The Transportation Chapter identifies the proposed Metro Rail as part of an existing and planned multi-modal transportation system throughout the City, with the Olympic/Crenshaw and Pico/San Vicente Stations being identified as parts of this system.

The proposed project would also facilitate the implementation of policies relevant to the proposed rail line extension such as; to improve transportation services needed to support Citywide economic development; to support completion of the Metro Rail Baseline rail transit system by the year 2010; and to promote the development of transit alignments and station locations which maximize transit service to activity centers. Furthermore, the proposed project would fulfill the desire to enhance transit access to neighborhood districts, community and regional centers; and would develop the transit facilities needed to accommodate the concentration of development at ~~around~~ those facilities while protecting existing single-family neighborhoods.

Preliminary Transportation Element of the General Plan

The proposed project would result in the development of Metro Rail Transit Lines and Stations identified in this Element, including the extension from the existing Wilshire/Western Station to the proposed Pico/San Vicente Station~~ which has been programmed for completion by 2009~~. The Preliminary Transportation Element identifies this extension as running along Crenshaw Boulevard, with a station located near the intersection of Olympic and Crenshaw Boulevards.

The engineering reports prepared for the previously approved Crenshaw alignment (which is also addressed as Alternative C in this SEIS/SEIR) identified numerous constraints which would be encountered along this alignment. This included, but was not limited to, the presence of high concentrations of subsurface hydrogen sulfide gas which would preclude deep bore tunneling. This resulted in the shallow underground and aerial alignments being studied for the Crenshaw alignment. These options resulted in the potential need to relocate numerous utilities, thus requiring a significant amount of property acquisitions and demolition, with significant displacement of residents. It was these findings which influenced the MTA to explore an alternative route which would achieve the same goal established in the Preliminary Transportation Element, that being to extend a transit line from the existing

Wilshire/Western Station to the proposed Pico/San Vicente Station. This SEIS/SEIR, specifically the evaluation of Alternatives A and B, is the result of those previous findings.

It is important to note that while the ultimate approval of either Alternative A or B would not specifically be consistent with the location of facilities currently identified in this Element (the Crenshaw alignment), approval of either of these alignment alternatives would be consistent with the overall intent, that being to extend a transit line from the existing Wilshire/Western Station to the proposed Pico/San Vicente Station. Since this Element is "preliminary", there would not be a need for a General Plan amendment, but would merely require revisions to this preliminary element, prior to its adoption, to reflect the proper location of this segment of the Metro Rail project.

The proposed project is further consistent with the Preliminary Transportation Element in that it would serve an area which was identified as having some of the highest levels of transit dependency in the City, and would develop facilities to serve the multi-modal function of transit centers.

Land Use/Transportation Policy for the City of Los Angeles

The proposed project is consistent with the Land Use/Transportation Policy in that it would provide for the development of transit facilities in an area with high transit use, improve air quality, ~~needed to influence future growth and development around transit stations,~~ and to help reduce reliance on the automobile.

General Plan Land Use Element

As mentioned previously, land use designations for the proposed project area are contained in the *Wilshire Community Plan* and the *West Adams-Baldwin Hills-Leimert Community Plan.* The southeast corner of the proposed project area also abuts the northwest corner of the *South Central Los Angeles Community Plan* area.

Alternative A, as proposed, is consistent with the General Plan. The MTA is not proposing any changes to the General Plan Land Use Element.

~~It is important to recognize that transit systems such as the proposed project are generally not limited to certain areas of any community. Inversely, the development of Community Plans and the identification of land use designations therein is based largely on the location of transit corridors and associated facilities. In terms of consistency with established land use designations, the proposed project would ultimately play a major role in the final determination of where certain land uses would be desired, as well as the density and character of that development. It is also important to remember that the Land Use/Transportation Policy allows for flexibility in designating land use boundaries to accommodate new transit facilities, thus avoiding inconsistencies between transit facilities and existing and/or future plans of an area.~~

- Wilshire Community Plan

The proposed project is consistent with the intent of this Plan in that it would provide the transit facilities which could allow for the finalization and implementation of existing land use plans which have been developed to promote the economic well-being of the community. It would also enhance ~~provide a major portion of~~ the area-wide circulation system/public transportation service to assist in meeting other objectives of the Plan which includes coordinating development of the Wilshire Community with other parts of the City such as the proposed *Wilshire Center* and *Miracle Mile Specific Plan* areas.

- West Adams-Baldwin Hills-Leimert Community Plan

The proposed project is consistent with the *West Adams-Baldwin Hills-Leimert Community Plan* in that it would provide the public transit facilities necessary to compliment the existing character, single-family neighborhoods, and any ~~accommodate the concentration of~~ future development of commercial and residential uses into the Crenshaw Center; and to connect the Crenshaw Center with other major centers in the City via rapid transit. This proposed project would also address other features addressed in the Plan related to the need for improved public transit systems needed to relieve traffic congestion associated with projected growth and development throughout the District, particularly in the immediate vicinity of the Crenshaw Center.

The proposed project could also service a potential future ~~the~~ Crenshaw-Prairie Line that would extend through this Plan area~~, and would provide direct linkage to a proposed station in the Crenshaw Center~~.

- South Central Los Angeles Community Plan

The proposed project would be consistent with the public transportation policy of this Community Plan since it would result in the development of public transportation facilities that would serve the transportation needs of the residents which have a high reliance on public transit. It would also provide transportation improvements necessary to assist the overall effort to promote the revitalization of declining land uses in the District.

Specific Plan Study Areas

Consistency with other proposed Specific Plan study areas which have not been developed or authorized, but which could affect, or be affected by the proposed project, cannot be accurately evaluated at this point in time. However, like all other existing Community Plans and associated Specific Plans, any of these future plans would likely contain policies associated with the desire to encourage the preservation of existing single-family neighborhoods, the development of transit facilities to meet the needs of the citizens, to focus development adjacent to ~~in areas surrounding~~ public transit facilities, and to link each Specific Plan area with other growth/activity centers throughout the region.

Redevelopment Plan for the Mid-City Recovery Development Project

The proposed project would be consistent with this Redevelopment Plan in that it would complete another link of the regional Metro Rail system, thus contributing to stimulating positive community changes in commercial ~~and industrial~~ corridors within the greater Mid-City area. The proposed project would also play a part in developing a mass transit system which would contribute to improved service for senior citizens, the disabled, and other transit-dependent members of the population.

Redevelopment Plan for the Wilshire Center/Koreatown Recovery Redevelopment Project

The proposed project would also be consistent with this Redevelopment Plan in that it would complete another link of the regional Metro Rail system, thus encouraging improved public transit services as called for in the Plan.

SCAG Regional Comprehensive Plan and Guide

Alternative A (Wilton/Arlington/Pico)

The proposed project would be consistent with the SCAG Regional Comprehensive Plan and Guide in that it supports local plans for ~~which call for increased density of future development located at strategic points along the~~ regional commuter rail, transit systems and activity centers; supports local jurisdictional strategies to establish mixed-use clusters and other transit oriented developments around transit stations and along transit corridors where appropriate; and encourage developments in and around activity centers, and transportation corridors.

It is important to note that it is not the intention of the proposed project to create new growth in the vicinity of the proposed transit facilities, but rather to provide expanded and enhanced transit opportunities throughout the general Los Angeles metropolitan area. In addition, future growth and development throughout the project area has been forecasted in general plan elements and redevelopment plans, in regional forecasts prepared by SCAG, and in numerous other planning-related documents prepared by and/or for the City of Los Angeles. In general, future growth in and around the proposed project area would eventually occur with or without the proposed project. Construction and operation of the proposed project should therefore not be seen as "causing" or "creating" growth, but rather as serving growth and development which has already been projected. For a more detailed discussion pertaining to future growth and development throughout the proposed project area, refer to Section 13.0 (Growth Inducement) of this SEIS/SEIR. However, in all policy documents, the preservation and strengthening of single-family neighborhoods is paramount.

Alternative B (Wilton/Arlington/Venice)

Since Alternative B would essentially provide the same facilities at the same locations as Alternative A, issues associated with compatibility and consistency with adopted plans and policies would be the same as described for Alternative A.

Alternative C (Crenshaw/Pico)

Approval of Alternative C would generally be consistent with all of the above-mentioned plans and policies, although there would be several differences from Alternatives A and B. The primary difference is that the *Preliminary Transportation Element of the General Plan* identifies Alternative C as the proposed location for linking the existing Wilshire/Western Station with the proposed Pico/San Vicente Station. However, since the *Transportation Element* has not been adopted, selection of either Alternative A or B would require revisions to the Element prior to it's adoption, while Alternative C would not.

Additionally, several of the above-referenced plans and policies call for the preservation of low density single-family residential units. Approval of Alternative C would result in the acquisition and subsequent demolition of an estimated 24 single-family residences, and 13 multi-family buildings. This could be construed as being inconsistent with some plans and/or policies. However, when put in the context of the total number of single-family residential units in the project area, the loss of this number of residential units would not be considered significant, as discussed in Section 7.6 (Property Acquisition and Displacement).

7.4.3 Cumulative Impacts

As required under CEQA Section 15130, the cumulative impacts of a project shall be discussed when they are significant, and should discuss related impacts resulting from similar projects. In the case of the proposed project, there are numerous plans and other documents which identify proposed projects which all result in cumulative impacts to land use. This would also include other segments of the citywide Metro Rail system.

In general, the Metro Rail system has been identified as a partial solution to alleviate the cumulative effects of forecasted growth throughout the Los Angeles area, including the potential degradation of regional air quality and increased traffic congestion.

No Project Alternative

Under the No Project Alternative, buildout of the existing Community Plans and associated Specific Plans would result in significant cumulative impacts to virtually all environmental aspects identified in this SEIS/SEIR. It is important to note that virtually all Community Plans and Specific Plans have been developed with an understanding that increases in public transit facilities are forthcoming, and that many of those facilities would be necessary to facilitate projected growth and development. In terms of cumulative land use-related effects, the development of increased densities of residential and commercial land uses which have been proposed in close proximity to proposed transit facilities would, at a minimum, result in significant increases in traffic congestion and related adverse air quality impacts.

The no project alternative would terminate the Red Line at the existing Wilshire/Western Station. This would preclude the west side of the City from having direct access to the Metro Rail system. This would prevent the future western extension to the I-405 Freeway. The no project alternative would result in a less effective mass transit system in the City, and it would place a continued reliance on the car for many commuters to downtown Los Angeles and other points along the line.

~~In general, without the approval of the public transit facilities proposed under any of the alternatives addressed in this SEIS/SEIR, much of the proposed future development identified in many of the proposed plans would not be able to be accommodated without generating significant environmental impacts, or would only be partially implemented, thus ultimately falling short of regional goals for economic revitalization and community rehabilitation.~~

Alternatives A, B and C

Specific combined effects of any of the proposed project alternatives with other actions may occur as a result of numerous factors. This would include, but not be limited to, future revision and updating of the *Wilshire District Plan*, as required by state law governing General Plans. This revision process could affect the overall amount of land designated for various uses, particularly in relation to the ultimate location of the selected alignment.

Other projects which may affect land uses in the study area include the possible construction of light-rail in the Crenshaw-Prairie Corridor and a future western extension of the Red Line to the I-405 Freeway, both of which would connect to the Pico/ or Venice/San Vicente Station.

The LACRA Draft Mid City Recovery Program EIR (September 1995) envisions new commercial and industrial development levels of almost one million square feet, and approximately 200 new residential units. The project alternatives could also involve improvements that could affect planned land use designations in the Wilshire District Plan and the West Adams Baldwin Hills Leimert District Plan. The adjacent Koreatown Specific Plan could also result in higher development levels resulting in a cumulative effect in terms of the intensity of land uses and the associated traffic congestion and related air quality impacts. The above projects, together with potential joint development in the station areas could have a combined cumulative effect with the proposed project, most of which would be associated with increased intensity of land uses and the associated increases in traffic and air pollution. However, each project proposed would require project-specific mitigation programs to ensure that potential environmental impacts would be eliminated or reduced to less than significant levels. Because of this, no significant cumulative impacts are expected.

Crenshaw Corridor Specific Plan

The proposed *Crenshaw Corridor Specific Plan* is located within the proposed *West Adams-Baldwin Hills-Leimert Community Plan* area, south of the project area. While it is not located within the project area, including station influence areas, there are goals and policies which have some relationship with the project. One specific goal identified in this Specific Plan is to "develop a public transit system that improves mobility and accessibility with convenient alternatives to automobile travel."

To help achieve this goal, the proposed Crenshaw/Prairie Line would traverse the entire length of the *Crenshaw Corridor Specific Plan* area. The Crenshaw/Prairie Line, if approved, would ultimately link activity centers as far south as Hawthorne, including Los Angeles International Airport, and could terminate at the proposed Pico/ or Venice/San Vicente Station site.

7.4.4 Mitigation Measures

To ensure that any potential impacts identified and discussed in this section of the SEIS/SEIR are eliminated or reduced to the maximum extent attainable, the following mitigation measures have been added to the proposed project. The mitigation measures listed below are grouped according to the threshold of significance criteria listed at the beginning of the Impact Section, and would be applicable to each of the proposed alternatives, with any additional measures specific to an alternative being identified as such.

Acquisition ~~and Demolition~~ of Existing Structures

1. To ensure that structures acquired by MTA ~~slated for demolition~~ do not create a nuisance, all ~~condemned~~ property will be demolished, used as field offices, or for storage ~~acquired~~ by MTA ~~and vacant structures will be demolished~~ within 6 months, if possible. Security and graffiti removal will be provided.

Maintenance of Vacant Land

2. Prior to project operations, the MTA will develop and implement a joint development program in collaboration with other appropriate public agencies and community groups focused on the re-use and disposition of remaining parcels to ensure that these properties do not remain vacant for a long period of time and are re-used for beneficial purposes, consistent with community needs. The MTA will demolish structures as quickly as possible after purchase and relocation of tenants, unless buildings are used as field offices or for storage. All sites will be secured with fencing and maintained on a regular basis.

3. Prior to operation of the Red Line operations along the Mid-City Segment the MTA~~'s Joint Development Department~~ will participate in a neighborhood planning process for developing MTA real property assets and linking land use and transportation policy. This commitment by the MTA will involve a strategic process to include pre-development, development, and implementation and neighborhood preservation planning to augment the quality of the built environment adjacent to transit facilities and corresponding neighborhoods. A site specific set of guidelines and standards will be developed to assist the MTA in securing private sector development partners to coordinate, implement, and manage a strategic development program while preserving existing neighborhoods.

4. Until such time as all unused properties remaining are disposed of or developed, MTA will landscape and maintain all vacant areas created by the project alternatives. Maintenance and security measures will include providing fencing, screening (if appropriate), lot cleanup, landscaping maintenance, and graffiti removal.

Compatibility and Consistency with Adopted Plans and Policies

5. The MTA will not seek zone changes, General Plan, or Specific Plan amendments to increase the development potential of land at or near stations in order to help assure the integrity of existing single-family neighborhoods.

No Project Alternative

6. For the impacts identified under the No Project Alternative, the mitigation is the development of one of the ~~four~~ build alternatives.

7.4.5 Unavoidable Significant Adverse Impacts

Under the No Project Alternative, none of the State, regional, or local transit-related plans, goals, and policies applicable to the proposed project would be implemented. The loss of the land use benefits associated with not implementing the State, regional, or local transit-related plans, goals, and policies is considered a significant adverse impact.

Implementation of the mitigation measures listed above will ensure that any of the potential land use-related impacts associated with the "build" alternatives will be eliminated, or reduced to a less than significant level.

7.5 DEMOGRAPHICS/ACCESSIBILITY FOR TRANSIT DEPENDENT POPULATIONS/ ENVIRONMENTAL JUSTICE

Introduction

This section addresses issues related to the demographic make-up of the area surrounding the ~~proposed~~ Metro Red Line Mid-City project. Baseline information contained in this section was obtained from: a) Southern California Association of Governments (SCAG), and/or b) the U.S. Census Bureau (1990). To-date, SCAG projections for year 2020 include only population estimates. To arrive at year ~~For~~ 2020 projections for age, ~~and~~ income, and other issues, a growth multiplier was calculated against the baseline information ~~1990 Census. MTA recognizes that SCAG has yet to approve this methodology.~~

This section analyzes ~~addresses~~ the project's ability to provide transit service to those individuals that rely on public transportation as their primary mode of transit ~~vehicle~~. This section also analyzes ~~addresses~~ the socioeconomic impacts this project would have on ~~adjacent~~ the communities that surround the stations ~~in and around the project site.~~ ~~and~~ In addition, it will estimate the size of the transit-dependent population in the Mid-City ~~project~~ area based on demographic information, such as: a) age, b) households without private transportation, and c) income levels. ~~Additionally,~~ The environmental justice section will focus on whether or not the proposed project would disproportionately affect minority and low-income populations.

For purposes of this analysis, the project area has been defined to include those census tracts that are located within a ½-mile radius of each station. These census tracts include 2126, 2127, 2128, 2129, 2131, 2132.01, 2132.02, 2161, 2172, 2181, 2182, 2213.01, 2213.02. These census tracts are graphically displayed on Figure 7-21.

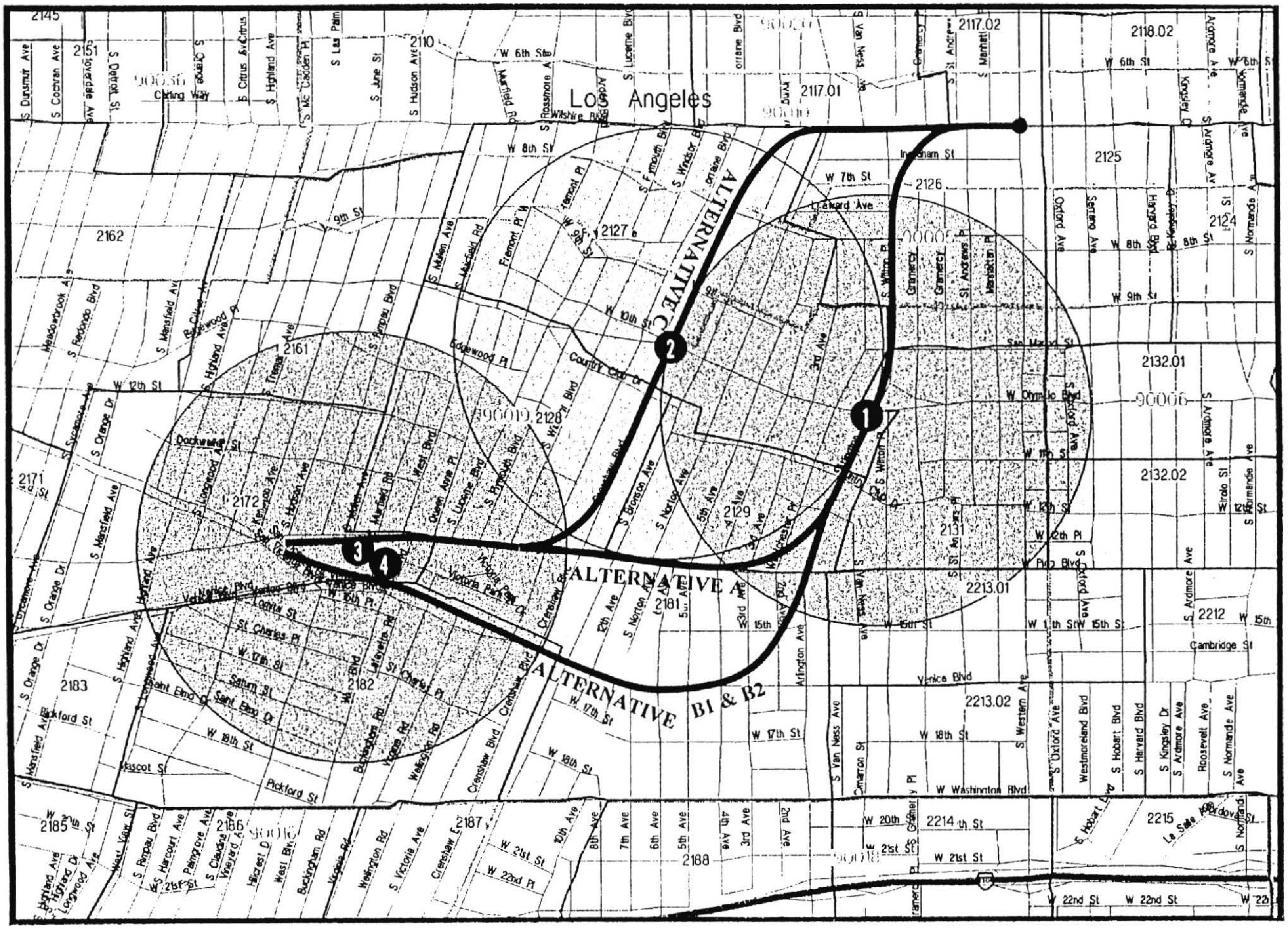
7.5.1 Environmental Setting

Regional Summary

Los Angeles County is the most populous county in the state of California. The 1990 census indicated that Los Angeles County had a population of about 8.8 million people. SCAG has projected that the population of Los Angeles County will grow to 12.2 million people by 2020. This data indicates that two-thirds of the population of the SCAG ~~Southern California~~ region (which includes Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura counties~~, and also one-third of the population of the entire state~~), will reside in Los Angeles County. Between 1980 and 1990 Los Angeles County's population grew by 19 percent, from 7.4 million to 8.8 million people. Given the 12.2 million population increase projected for the year 2020, Los Angeles County is anticipated to grow an additional 38 percent.

Local Summary

The City of Los Angeles is the largest city in California. It is home to more than ~~represents over~~ one-third of the population in Los Angeles County, with a 1990 population of about 3.5 million people. SCAG has ~~and a~~ projected that the City of Los Angeles will have a population ~~2020 estimation~~ of more than 4.2 million in the year 2020. This equates to ~~would be~~ an increase of 20 percent. According to ~~the~~ 1990 census information, there were about 1.2 million occupied housing units in the City of Los Angeles at that time. Of these occupied units, approximately 16 percent, ~~totaling~~ or 186,000 households, lacked private transportation. It is forecasted that the number of households without private transportation ~~estimated by the year 2020 this amount~~ will continue to increase through the year 2020.



❶ = Olympic/Arlington Station ❷ = Olympic/Creshaw Station ❸ = Pico/San Vicente Station ❹ = Venice/San Vicente Station

ULTRASYSTEMS
ENVIRONMENTAL
INCORPORATED

FIGURE 7-21
STATION INFLUENCE AREAS (1/2 MILE RADIUS)

~~The proposed Olympic/Arlington, Olympic/Crenshaw, and Pico/ or Venice/San Vicente Stations are less than one mile apart in the southeast portion of the Wilshire Community Planning Area, north of West Adams, Baldwin Hills, and the Leimert District Planning Area. For purposes of this analysis, the project area has been defined to include the census tracts which cover an area within a ½-mile radius of each station. These census tracts include 2126, 2127, 2128, 2129, 2131, 2132.01, 2132.02, 2161, 2172, 2181, 2182, 2213.01, 2213.02. Figure 7-21 graphically displays these census tracts.~~

Population & Ethnicity

According to the 1990 census, the demographic make-up of the population in the project area was diverse ~~has a large concentration of non-white people~~. In 1994, SCAG estimated that the total resident population within the Mid-City area was ~~estimated to be~~ 67,093, as shown in Table 7-22. The median age of this population was 33.4 years, which was higher than the median age of both the City and County of Los Angeles (30.7 years) at that time. In the year 2020 the population within the Mid-City area has been projected to increase 33 percent to approximately 89,025 people, and the age ratio is not expected to fluctuate significantly. ~~Table 7-22 displays the population projected to the year 2020.~~ Table 7-23 graphically compares the 1994 population to the year 2020 projected population.

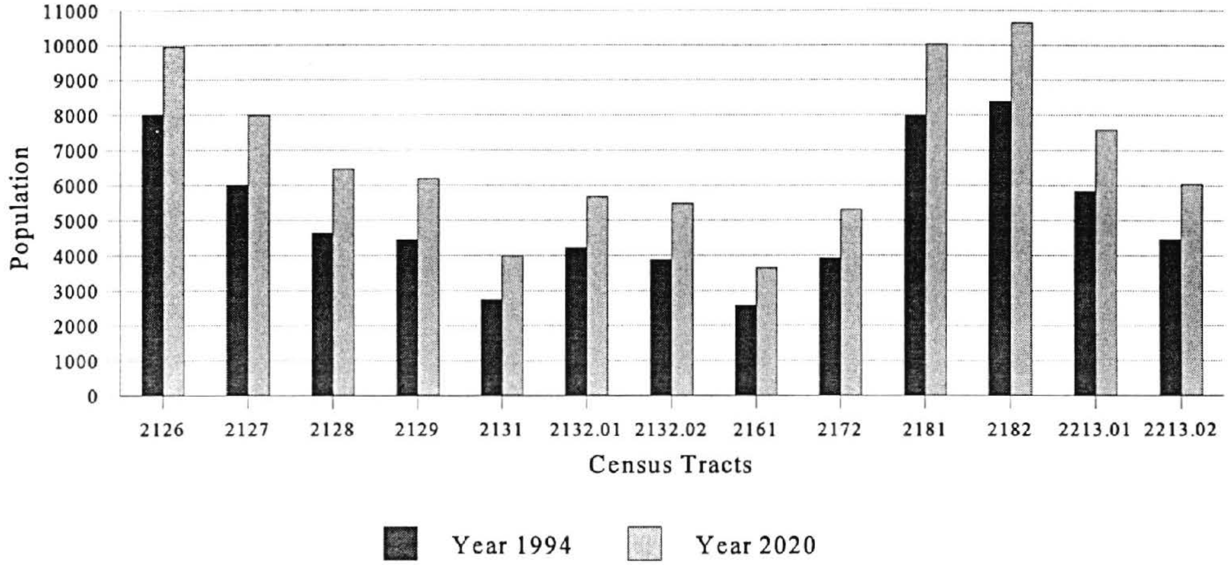
Table 7-22
Mid-City Population Projected to the Year 2020

Census Tract	Year 1994	Year 2010	Year 2020[1]	Year 2020 Percent Growth
2126[a, b]	8,017	9,175	9,950	24%
2127[a, b]	5,998	7,193	7,991	33%
2128[b, c]	4,637	5,736	6,469	40%
2129[a, b]	4,456	5,494	6,186	39%
2131[a,]	2,739	3,485	3,983	45%
2132.01[a,]	4,215	5,091	5,675	35%
2132.02[a,]	3,879	4,842	5,484	41%
2161[c]	2,577	3,223	3,653	42%
2172[c]	3,915	4,756	5,316	36%
2181[a, b, c]	7,986	9,209	10,025	26%
2182[c]	8,390	9,749	10,655	27%
2213.01[a]	5,824	6,883	7,589	30%
2213.02[a]	4,460	5,413	6,049	36%
Total	67,093	80,249	89,025	33%

[1] Source: U.S. Census Bureau, 1990; SCAG
a. Olympic/Arlington Station Influence Area
b. Olympic/Crenshaw Station influence Area
c. Pico/ or Venice/San Vicente Station influence Area

Table 7-23

Year 2020 Projected Mid-City Population



Like the City and the County of Los Angeles, the Mid-City project area is ethnically and racially diverse. This cultural mixture is predicted to remain with minor ~~very little~~ changes in the ethnic and racial percentages, however, the Hispanic population is expected to increase by the year 2020 more than the other groups. Table 7-24 displays the ethnic and racial make-up by percentage of population in the project area.

Income

The Mid-City project area's economic diversity is reflected in the wide range of income levels among the thirteen census tracts within the project area, as shown in Table 7-24. In general, census information for tracts covering areas north of Olympic Boulevard and south of Pico Boulevard indicate higher income levels than those indicated for areas between Olympic and Pico Boulevards. By the year 2020 this income ratio is not projected to change. Table 7-24 also shows the income characteristics within the project area. Table 7-25 graphically displays the ethnic make-up in the project area.

Station Census Tract Areas and Station Influence Areas

The station influence area is defined as the estimated distance that a majority of people would be willing to walk in order to access a station. As displayed earlier on Figure 7-17, there are three station influence areas associated with the "build" alternatives. A station census tract area is comprised of those census tracts that are located partially or entirely within a station influence area. Since station influence areas overlap, station census tract areas are generally located in more than one station influence area. The census tracts, total station census tract area population, ~~and~~ the station influence area population, and the transit-dependent population near the three stations are shown in Table 7-23.1. ~~as follows: The census tracts near the Olympic/Arlington Station consist of tracts 2126, 2127, 2129, 2131, 2181, and 2213.01; the with a total station census tract area population is of 40,689; while the total station influence area population is 10,523 and a transit-dependent population of 22,464. The Pico/ or Venice/ San Vicente Stations area consists of tracts 2128, 2161, 2172, 2181, and 2182 with a total station population of 31,958, while the station influence population totals 10,958 and a transit-dependent population of 17,831; the~~

~~Crenshaw/Olympic station consists of tracts 2126, 2127, 2128 and 2129 with a total station populations of 26,849, while the station influence population in 8,377 and a transit-dependent population of 14,229.~~

Table 7-23.1
1994 Populations Near the Three Stations

Station	Census Tracts	Census Tract Area Population	Station Influence Area Population	Transit-Dependent Population
Olympic/Arlington	2126, 2127, 2129, 2131, 2181, and 2213.01	40,689	10,523	22,464
Olympic/Crenshaw	2126, 2127, 2128 and 2129	26,849	8,377	14,229
Pico/ or Venice/San Vicente	2128, 2161, 2172, 2181, and 2182	31,958	10,958	17,831
Total		99,496	29,858	54,524

7.5.2 Project Impacts

Thresholds of Significance Criteria

Accessibility for Transit-Dependent Populations

The proposed project would have a significant effect if it were to deny or otherwise limit access to transit dependent populations.

Vacancy Rates

The proposed project would have a significant effect if it were to change the vacancy rate by more than three-percent, either up or down.

Environmental Justice

The proposed project would have a significant effect if it were to create unmitigated environmental impacts that would disproportionately affect a minority or low income population.

Introduction to the Impact Analysis

The impact analysis is performed for: No Project, Alternatives A and B, and Alternative C. Alternatives A and B are analyzed together because they share the same two station influence areas.
~~**Alternatives A, B1, B2, and C**~~

~~The following discussion relates to all four of the "build" alternatives.~~

Table 7-24
Ethnic and Income Characteristics in the Project Area

Census Tract	White	Black	Asian	Hispanic	Other	Totals	Median Income ($)	Percentage Below Poverty Level
2,126.00[a, b]	11%	12%	41%	36%	1%	100%	20,382	22%
2,127.00[a, b]	27%	12%	36%	24%	1%	100%	43,097	10%
2,128.00[b, c]	5%	17%	27%	48%	2%	99%	25,677	21%
2,129.00[a, b]	5%	23%	21%	51%	0%	100%	18,317	29%
2,131.00[a]	9%	23%	31%	36%	1%	100%	$26,667	19%
2,132.01[a]	4%	5%	45%	46%	0%	100%	$18,859	27%
2,132.02[a]	2%	8%	23%	67%	0%	100%	$22,078	24%
2,161.00[c]	30%	39%	19%	8%	3%	99%	$41,054	8%
2,172.00[c]	11%	55%	8%	25%	1%	100%	$27,917	15%
2,181.00[a, b, c]	4%	26%	16%	52%	1%	99%	$23,342	20%
2,182.00[c]	2%	48%	3%	45%	2%	100%	$24,030	28%
2,213.01[a]	4%	28%	8%	59%	0%	99%	$21,136	51%
2,213.02[a]	4%	36%	7%	52%	1%	100%	$22,447	28%
Project Area	10%	28%	22%	39%	1%	100%	27,977	20%
L.A. City	37%	13%	9%	39%	1%	99%	30,925	18.9%
L.A. County	41%	11%	10%	37%	1%	100%	34,965	15.1%

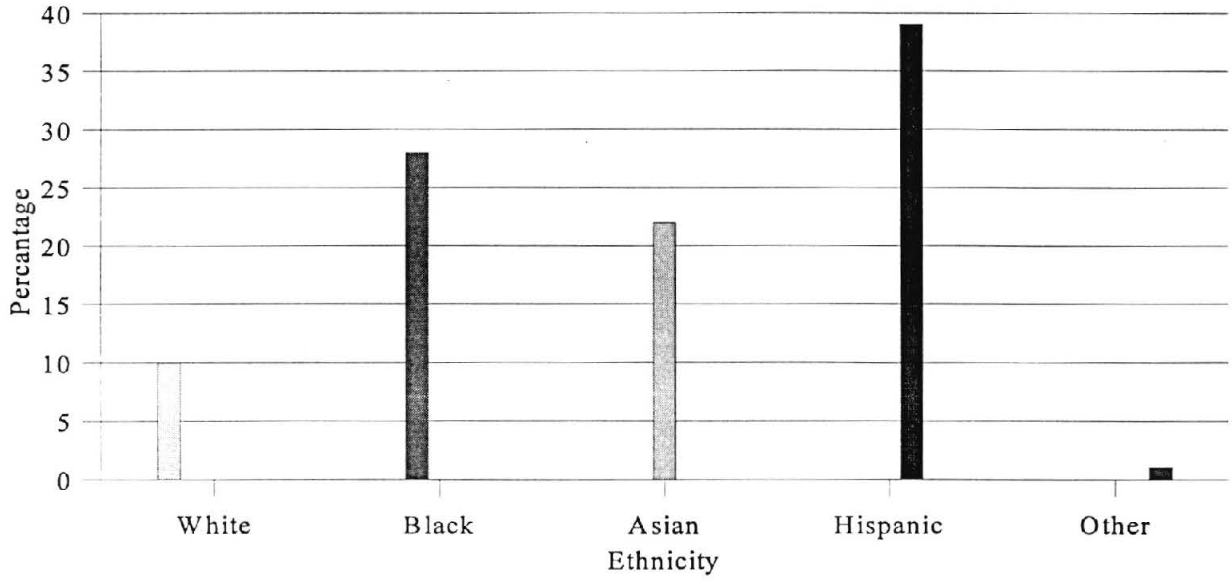
Source: U.S. Census Bureau, 1990; Lee Andrews Group, Inc., 1997
a. Olympic/Arlington Station Influence Area
b. Olympic/Crenshaw Station influence Area
c. Pico/ or Venice/San Vicente Station influence Area
N
ote: 1 The U.S. Census Bureau defines Hispanic as an ethnic category while White, Black, Asian and Other are considered racial groups. An Hispanic person may also consider themselves part of any of the above racial groups and therefore, the percentages may exceed 100 percent up to 20 to 30 percent.

Accessibility for Transit-Dependent Populations

The purpose of this section is to determine how well the proposed project would serve the transit-dependent population residing within each station influence area. For purposes of this analysis, youth (ages 5-17), aged (65 years and older), households without private transportation, and households which are below the poverty level are used as general indicators of transit dependent populations.

Table 7-25

Ethic Make-up Within the Project Area By Percentage



Every census tract defined by the U.S. Bureau of Census is composed of two to five block groups. In order to exact more precise demographic statistics of populations within the station influence areas, block group data were utilized to adjust census tract statistics in cases where the ½-mile radius divided a census tract.

This section identifies only a portion of the total transit-dependent population that would be served by the project. It does not identify Mid-City Segment users for whom the Mid-City area is a destination or those for whom the area is utilized as a convenient transfer point. These users may transfer to or from either an MTA bus or a Santa Monica Municipal bus for a commute to or from downtown Los Angeles or other destinations along the MTA rail lines. No information is available on the sizes of these other user groups.

No Project

Under the No Project Alternative rail access would not be provided to transit-dependent populations in the Mid-City area consisting of: youth, aged, households without private transportation, and households below the poverty level.

Populations of Youth and Aged (Year 2020)

Youth (ages 5-17) are expected to account for a significant portion of the Year 2020 transit-dependent population in each of the station influence areas. The proportion of the aged population residing in the Mid-City area ~~station influence areas~~ is no different than that of the city and the county at 8 percent, respectively. The Metro Red Line Mid-City segment would provide improved public transit services to youth and aged transit-dependent populations.

Alternatives A and B

The total youth population within ~~around~~ the Olympic/Arlington station census tract area has been estimated to be ~~site is~~ about 6,564 young people, of which 2,917 (or 44 percent) of the youth population would reside in the ~~which includes a~~ station influence area ~~of 2,917 representing 44 percent of the total transit-dependent youth~~

~~population in the station influence area~~. It has also been estimated that there would be ~~are~~ about 6,000 young people living in the station census tract area of the proposed Pico/ or Venice/San Vicente Station site, of which 3,730 (or 62 percent) would reside in the ~~includes a~~ station influence area ~~of about 3,730~~. ~~This figure represents 62 percent of the transit-dependent youth population for the Pico/ or Venice/San Vicente station influence area.~~ The total number of young people that the Red Line would provide a mode of transportation for within the Alternative A and B station census tract areas is 12,564, and the total within the station influence areas is 6,647.

The aged population within ~~along~~ the ~~proposed~~ Olympic/Arlington station influence area has been estimated to be ~~is~~ 1,708 (or 43 percent) of the overall total aged, transit-dependent station census tract area population of 4,007. Within the Pico/San Vicente station influence area the aged has been estimated to be ~~represent~~ 1,849 (or 57 percent) of a total aged transit-dependent station census tract area population of 3,224. The total number of aged people that the Red Line would provide a mode of transportation for within the Alternative A and B station census tract areas is 7,231, and the total within the station influence areas is 3,557.

The youth and the aged have a combined total of 19,795 residing in the Alternative A and B station census tract areas and 10,204 living in the station influence areas that the Red Line would provide a mode of transportation for.

Alternative C

The total youth population within ~~around~~ the Olympic/Crenshaw station census tract area ~~site~~ has been estimated to be ~~is~~ 4,217, of which 2,477 (or 59 percent) would reside in the ~~includes a~~ station influence area ~~total of about 2,477 youth or 59 percent of the transit-dependent youth population in the station influence area~~. The youth population in the Pico/San Vicente station census tract areas and the station influence area is the same as described above for Alternatives A and B. ~~all three of the station influence areas is are much higher than the city and county statistics, where youth make up 15 and 14 percent of the city and county populations, respectively. The Mid-City segment would offer service to an estimated 9,124 young people within the station influence areas.~~ The total number of young people that the Red Line would provide a mode of transportation for within the Alternative C station census tract areas is 10,217, and the total within the station influence areas is 6,207.

~~The proportion of the aged population in the station influence areas is no different than that of the city and the county at 8 percent respectively. The aged population within along the proposed Olympic/Arlington station influence area will be is 1,708 (or 43 percent) of the overall total aged, transit-dependent station census tract area population of 4,007. Within the Pico/San Vicente station influence area the aged will represent 1,849 (or 57 percent) of a total aged transit-dependent station census tract area population of 3,224. While~~ The Crenshaw/ Olympic station influence area has been estimated to have an aged ~~has a influence area~~ population of 1,816 (or 65 percent) of the total estimated aged population within the ~~transit-dependent~~ station census tract area ~~population~~ of 2,788. The aged population in the Pico/San Vicente station census tract areas and the station influence area is the same as described above for Alternatives A and B. The total number of aged people that the Red Line would provide a mode of transportation for within the Alternative C station census tract areas is 6,012, and the total within the station influence areas is 3,665. ~~About 5,373 which represents (54 percent) of the aged older residents in the station influence area will be served.~~

The youth and the aged have a combined total of 16,229 residing in the Alternative C station census tract areas and 9,872 living in the station influence areas that the Red Line would provide a mode of transportation for.

Households Without Private Transportation (Year 2020)

The station influence areas ~~around the proposed stations~~ contain a larger proportion of households without private transportation than the average of both the City and County of Los Angeles.

Alternatives A and B

The Olympic/Arlington station census tract ~~influence~~ area is projected to have a population of 3,165 people that would not have private transportation, of which 1,479 (or 47 percent) would reside in the station influence area ~~would not have private transportation~~. The Pico/ or Venice/San Vicente station census tract area is projected to have a population of 1,971 people that would not have private transportation, of which 1,106 (or 56 percent) would reside in the station influence area station influence area ~~is estimated to have a transit-dependent population of 1,106 (56 percent) that does not have private transportation~~. The total number of people that would not have private transportation that the Red Line would provide a mode of transportation for within the Alternative A and B station census tract areas is 5,136, and the total within the station influence areas is 2,585.

Alternative C

The Olympic/Crenshaw station census tract area is projected to have a ~~transit-dependent~~ population of 1,939 people that would not have private transportation, of which 1,094 (56 percent) would reside in the station influence area. The numbers of people that would not have private transportation in the Pico/San Vicente station census tract areas and the station influence area are the same as described above for Alternatives A and B. ~~The Metro Red Line Mid-City Segment project would offer service to about 3,679 households which would be without private transportation.~~ The total number of people that would not have private transportation that the Red Line would provide a mode of transportation for within the Alternative C station census tract areas is 3,910, and the total within the station influence areas is 2,200.

Households Below Poverty Level (Year 2020)

According to the U.S. Census Bureau, the poverty threshold is revised annually to allow for changes in the cost of living and is defined according to the number of children within a family, age of the house holders, and family size. For the 1990 Census, the average poverty threshold for a family of four was $12,674. Poverty thresholds were applied on a national basis and were not adjusted for regional, state, or local variations in cost of living.

There are significant numbers of households that are below the poverty level in all ~~three~~ of the station influence areas. The local poverty statistics provided below are greater than the 18.9 and 15.1 percent in the City and County of Los Angeles, respectively. The ~~proposed~~Metro Red Line Mid-City segment project would provide improved access to job opportunities outside of the Mid-City area for those households below poverty level.

Alternatives A and B

The Olympic/Arlington station census tract areas have approximately 8,728 households below the poverty level of which ~~There are about~~ 4,419 (or 51 percent) reside in the Olympic/Arlington station influence area. ~~4,273 or 64 percent around~~ The Pico/ or Venice/San Vicente station census tract areas have approximately 6,636 households below the poverty level of which 4,273 reside in the station influence area. The total number of households below the poverty level that the Red Line would provide a mode of transportation for within the Alternative A and B station census tract areas is 15,364, and the total within the station influence areas is 8,692.

Alternative C

~~and 2,990 or 57 percent within~~ The Olympic/Crenshaw station census tract areas have approximately 5,285 households below the poverty level, of which 2,990 (or 57 percent) would reside in the station influence area. The numbers of households below the poverty level in the Pico/San Vicente station census tract areas and the station influence area are the same as described above for Alternatives A and B. The total number of households below the poverty level that the Red Line would provide a mode of transportation for within the Alternative C station census tract areas is 11,921, and the total within the station influence areas is 7,263. ~~The Mid-City Segment would service approximately 11,682 people below the poverty level in the station influence area.~~

Tables 7-26 and 7-27 combine the information provided above.

Vacancy Rates

Vacancy Rate in Los Angeles City

The City of Los Angeles has 1,299,963 housing units of which 82,558 are vacant, based upon information in the 1990 U.S. Census. The current vacancy rate within the city according to SCAG is approximately 6.35 percent. Information concerning the vacancy rate in the year 2020 has not yet been clearly delineated, however, according to current data provided by SCAG the vacancy rate should decrease to 5.35.

Vacancy Rate in Los Angeles County

The County of Los Angeles has about 3,163,343 housing units, 173,791 of which are vacant, based on 1990 U.S. Census. The vacancy rate for Los Angeles County is approximately 5.94 percent. Also the information concerning the vacancy for the county for the year 2020 has not yet been clearly delineated, however, according to SCAG the vacancy rate should remain the same at 5.94 percent.

Vacancy Rate in Mid-City ~~Project~~ Area

The Mid-City ~~project~~ area has 38,446 housing units of which 2,216 are vacant, based upon information found in the 1990 U.S. Census. Based on this information, the vacancy rate in the Mid-City area is 5.76 percent, slightly lower than the city average of 6.35 percent. Household size in the census tracts within the Mid-City area are typically two persons per housing unit. According to SCAG information, this is expected to increase to about 3 persons per housing unit by the year 2020.

Table 7-28 provides information for the year 2020 ~~on the existing condition~~ within each study area, such as the average number of persons per household, the number of overcrowded units, the median household incomes, the median housing values, and the median contract rents. Overcrowding of the housing supply is determined based on the percentage of units with more than two persons per room. The afford ability of housing stock is assessed based on median housing values and median contract rents: housing afford ability is defined as monthly housing expenses which do not exceed 30 percent of the median household income. As shown in Table 7-28, the median housing value in the Mid-City project area is higher than in the city or the county of Los Angeles, while the median housing income and contract rent are lower. The Mid-City project area also has a slightly higher percentage of overcrowded units.

No Project

The No Project Alternative would not have an effect on the vacancy rate in the Mid-City area.

Table 7-26
Total Population within County, City and Project Area

Location	Total Population 1990	Total Population Projected to 2020	Total Transit-Dependent Population to 2020	% Transit-Dependent of Total Population	5-17 Years (Youth) 2020 Population	%	65 + Years (Aged) 2020 Population	%	Households w/out Private Transportation 2020 Population	%	Persons Below Poverty Level 2020 Population	%
County of Los Angeles	9,231,496	12,252,161	3,234,700	26%	1,847,218	15%	999,916	8%	387,566	11%	1,520,061	15%
City of Los Angeles	3,622,288	4,840,130	2,040,504	42%	674,970	14%	401,684	8%	215,808	15%	748,042	19%
Mid-City Project Area	67,093	89,025	43,799	49%	13,508	15%	7,462	8%	5,469	6%	17,360	20%

Source: U.S. Census Bureau, 1990; Lee Andrews Group, Inc.

Table 7-27
Transit-Dependent Population within Station Influence Area Using 2020 Projections

Location	Total Population 1990	Total Population Projected to 2020	Total Transit-Dependent Population to 2020[a]	% PTDS (1) of Total Pop.[b]	Transit-Dependent Station Influence Area (2) 2020[c]	% TDSI (2) of PTDS (1)[d]	5-17 Years (Youth) Census Tract Area Pop.	5-17 Years (Youth) Station Influence Area Pop.	%	65 + Years (Aged) Census Tract Area Pop.	65 + Years (Aged) Station Influence Area Pop.	%	Households w/out Private Transportation Census Tract Area Pop.	Households w/out Private Transportation Station Influence Area Pop.	%	Persons Below Poverty Level Census Tract Area Pop.	Persons Below Poverty Level Station Influence Area Pop.	%
Arlington/Olympic	35,020	40,689	22,464	55%	10,523	47%	6,564	2,917	44%	4,007	1,708	43%	3,165	1,479	47%	8,728	4,419	51%
Olympic/Crenshaw	9,093	26,849	14,229	53%	8,377	59%	4,217	2,477	59%	2,788	1,816	65%	1,939	1,094	56%	5,285	2,990	57%
Pico/ or Venice/San Vicente	27,505	31,958	17,831	56%	10,958	61%	6,000	3,730	62%	3,224	1,849	57%	1,971	1,106	56%	6,636	4,273	64%
Total Station Areas	71,618	99,496	54,524	55%	29,858	55%	16,781	9,124	54%	10,019	5,373	54%	7,075	3,679	52%	20,649	11,682	57%

Source: U.S. Census Bureau, 1990; Lee Andrews Group, Inc.
a. Transit dependent population within the station area.
b. Percentage of the transit-dependent population relevant to the total station population.
c. Transit-dependent people in the station influence area.
d. Percentage of the transit-dependent population in the station influence area relative to the station area transit-dependent population in the station area.

Table 7-28
Household Characteristics Projected to the Year 2020

Study Area	Average Number of Persons Per Household	More Than Two Persons Per Room				Median Household Income ($)	Median House Value ($)	Median Rent ($)
		Owner Occupied Units		Renter Occupied Units				
		No.	%	No.	%			
L.A. County	3.38	36,911	2	196,279	11	40,626	263,054	662
L.A. City	3.25	13,112	2	103,651	13	35,932	284,085	632
Mid-City Area*	3.13	5,669	9	19,216	28	29,941	214,624	622

* Median values for this area were estimated by calculating a weighted average of the median value for each census tract within the study area.

Source: U. S.. Census Bureau, 1990; Lee Andrews Group, Inc., 1997.

Alternatives A and B

Alternatives A, B1, and B2 would acquire 3 and demolish 1 single-family units and 3 multi-family buildings with 45 units. If the two southern most single-family dwelling units are acquired (for the Olympic/Arlington Station), they would not be demolished; they would be used for construction office space. The loss of this number of housing units by Alternatives A, B1, and B2 is not considered a significant effect as to the vacancy rate in the area since it represents about two-tenths of one percent of the total renter occupied housing units (19,216), and about two percent of the vacant units (2,216).

Alternative C

Alternative C would acquire and demolish 24 single-family units and 13 multi-family buildings with 89 units. The loss of 113 residential units would result in a significant effect since it represents a five percent loss in the number of vacant units (2,216).

Environmental Justice

Background

Information contained in this section of the SEIS/SEIR was obtained from Title VI of the Civil Rights Act of 1964, President Clinton's Executive Order No. 12898, February 11, 1994, and the U.S. Department of Transportation Final Environmental Justice Strategy and Proposed Order.

What is Environmental Justice?

Since the early 1970s ~~studies have shown~~ it has been commonly known that communities that are predominately racial minorities and low-income experience greater environmental health risks and do not receive equal environmental protection as non-minority and higher income communities. In 1983, Dr. Benjamin Chavis of the National Association for the Advancement of Colored People (NAACP) mounted a legal battle to combat these occurrences by working to ensure that communities with concentrations of racial minorities and low-income people do not have an unfair amount of adverse environmental impacts.

Dr. Chavis termed this movement as Environmental Justice which is currently used by an array of civil rights and environmental organizations, governmental entities, and individuals interested in protecting the rights of politically powerless and disadvantaged people by ensuring that racial minority and low-income communities do not bear disproportionately environmental health risks.

On February 11, 1994, President Clinton issued an Executive Order on Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (Executive Order 12898). The order calls for Federal agencies to make "...achieving environmental justice part of its mission by identifying and addressing as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations." The Executive Order also requires each federal agency to "conduct its programs, policies, and activities that substantially affect human health or the environment, in a manner that ensures that such programs, policies, and activities do not have the effect of excluding persons (including populations) the benefits of, or subjecting persons (including populations) to discrimination under, such programs, policies, and activities, because of their race, color, or national origin." On June 29, 1995, the U.S. Department of Transportation (USDOT) issued its Final Environmental Justice Strategy and also a Proposed Order to Address Environmental Justice in Minority Populations and Low Income Populations (Federal Register, Vol. 60. No. 125, Thursday, June 29. 1995). A Final Order has not yet been published by USDOT.

President Clinton's Executive Order requires that an environmental justice test be applied to ensure that there are no disproportionate adverse environmental impacts on a minority and low-income population from the proposed project; that the community benefits from the proposed project and that the community had access to information on and the opportunity for public participation in the proposed project. The test involves the following questions (1) Is there an adverse disproportionate impact?, (2) Are there shared economic benefits? And (3) Is there effective community participation?

Test One: Disproportionate Impact

The impact analysis has to address two questions. First, will the proposed Mid-City project cause any significant adverse environmental impacts that cannot be mitigated by feasible mitigation measures? Second, if there are any unmitigated environmental impacts, will they disproportionately affect a minority or low-income population?

Will There Will Be Any Significant Unmitigated Environmental Impacts?

~~No.~~ Yes. As fully described in Section 9.0 (Unavoidable Adverse Impacts), the following environmental impacts would not be mitigated to a less than significant level:

- Under Land Use, the No Project Alternative would not implement any of the State, regional, or local transit-related plans, goals, and policies applicable to the proposed project. The loss of the land use benefits associated with not implementing the State, regional, or local transit-related plans, goals, and policies is considered a significant adverse impact.

- Under the No Project Alternative, rail access would not be provided to transit-dependent populations in the project area which would connect people to job opportunities outside of the area and saving them time and money with more efficient transportation service. The loss of this transit benefit is considered a significant adverse impact.
- The loss of 113 residential units under Alternative C would result in a significant effect to the vacancy rate since it represents a five percent loss in the number of vacant units in the Mid-City area (113/2,216 = 5%).
- Under Alternatives A and C, the displaced Builder's Discount business may not be able to relocate within the project area due to the scarcity of large vacant properties. Because this business provides unique services to the community, its displacement may remain an unavoidable significant adverse impact if it cannot be relocated within the immediate area. Alternative B does not result in this potential unavoidable adverse impact.
- After implementation of the mitigation measures, it is possible that unavoidable significant adverse business disruption impacts would still occur during the construction of the Red Line Mid-City Segment. These disruptions are likely to occur at the following locations:
  Alternatives A, B1, and B2: On the northwest corner of Olympic Boulevard and Wilton Place the normal business operations of the Korean TV Station and the Buddhist Temple could be affected.
  Alternatives A and C: Cut-and-cover construction (during the installation and removal of the concrete street decking) on Pico Boulevard between Victoria Avenue and the Pico/San Vicente Station would affect the normal business operations of the businesses along this commercial strip.
  Alternative C: Cut-and-cover construction (during the installation and removal of the concrete street decking) on Crenshaw Boulevard from 8th Street to a point 1,100 feet south of Country Club Drive would affect the normal business operations of the businesses along this commercial strip.
  Alternatives A, B1, B2, and C: Construction activities on the construction staging area south of Pico Boulevard between San Vicente and West Boulevards would affect the businesses on the north side of the street along this commercial strip. The potential removal of the TBM from within Wilshire Boulevard immediately west of Western Avenue would also affect the businesses along this commercial strip.
- During construction, although the mitigation measures would reduce air quality impacts of CO, ROC, NO_X, and SO_X, project related emissions would remain an unavoidable significant adverse impact of constructing any of the ~~four~~ "build" alternatives.
- Under Alternatives A and C, potential impacts to sensitive receptors from H_2S odors could be a significant adverse impact of the project.
- Minimal subsidence may represent an unavoidable adverse impact to historic structures along all of the ~~four~~ "build" alternative alignments. Such subsidence could result in cracks in foundations, walls, etc..
- Impacts to paleontological resources from tunnel boring could not be mitigated to a less than significant level due to the difficulty of detecting and recovering fossil remains and associated data from the tunnels. Impacts to paleontological resources from tunnel boring and other project related excavations would result in unavoidable significant adverse impacts for Alternatives A, B1, B2, and C.

~~The primary adverse effects of the proposed project alternatives are related to the displacement of residents at station entrance sites, construction work areas, and along utility relocation routes, as well as noise and traffic disruption that would occur during construction of the project. As described in Section 7.6.4, persons displaced by the project would receive relocation assistance and payments in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act, as amended. Noise and traffic impacts during construction would be mitigated to the extent possible with the implementation of measures such as a Worksite Traffic Control Plan and the use of noise specifications and scheduling described in Sections 7.2.4 and 7.11.4.~~

Will the Unmitigated Environmental Impacts Disproportionately Affect Minority or Low-income Populations?

No. As described earlier in this section, most of the census tracts within the project area generally include at least proportional and in some cases a higher percentage of minority and low-income populations than the City or County as a whole. Forty-nine percent of the population is Hispanic, compared to 39 percent for the City and 37 percent for the County of Los Angeles. The concentration of black population in the project area (28 percent) is greater than in the City of Los Angeles (13 percent) or the County of Los Angeles (11 percent), as is the Asian population (25 percent) compared to 9 percent and 10 percent in the City and the County of Los Angeles, respectively. The median income for the project area ($29,942) is 17 percent less than the City ($35, 932) and 27 percent less than the County ($40,626). Although, the populations affected by the project's adverse affects would also include a higher percentage of minority and low-income populations than the City or the County, the effects on low-income and minority populations would not be disproportionately high. Minority and low-income populations are dispersed throughout the affected census tracts and would be impacted similarly to other non-minority and higher income populations as a result of ~~the proposed project~~ implementing any one of the ~~four~~ "build" alternatives. More importantly, most ~~any~~ adverse impacts would be mitigated using the measures outlined in the earlier sections.

Because the proposed project would not have any disproportionate environmental effect on a minority ~~and~~/or low-income population the two remaining environmental tests are not required from the standpoint of the environmental justice analysis. However, because the Mid-City project would satisfy all three of the required tests, the remaining two tests are also analyzed.

Test Two: Benefits

This test is intended to show that if there were disproportionate adverse impacts, there were enough benefits that would accrue to the minority and low-income populations from the project to offset these adverse impacts. The Metro Red Line Mid-City Segment project would benefit one of the highest transit-dependent areas in the city. General benefits include providing an efficient transit system; connecting residents to major employment and retail centers thereby spurring economic development; and improving air quality. The following are examples of more specific project benefits.

Economic Development

~~As outlined in greater detail in Section 7.4.1 of the SEIS/SEIR, the following Land Use measures would result in economic benefits to the Mid-City communities.~~

~~*The Mid-City Recovery Development Project* is part of the City of Los Angeles Community Redevelopment Agency (CRA) revitalization and recovery efforts for areas affected by the April 29, 1992 civil unrest. The Mid-City Recovery Area is one of the eight priority areas identified by the City Council. Objectives of the recovery plan include reinvestment in commercial and industrial corridors within the greater Mid-City area and to improve mass transit for the transit-dependent population in that area.~~

Joint Development Program to be created by the MTA in collaboration with other public agencies and private sector development partners that would focus on the use of land in the project area to stimulate future development consistent with the needs of the community.

Safety and Security

This project would increase the availability of safe and secure transit stations for the residents which are user friendly and aesthetically pleasing.

Air Quality

This project would contribute to the achievement of the air quality goals in the Mid-City area~~ which is otherwise located in a severe non-attainment area for two criteria pollutants~~.

Transportation

This project would improve transit services to Mid-City's transit-dependent area by connecting people to job opportunities outside of the area and saving them time and money with more efficient transportation service.

Test Three: Community Participation

This test is intended to~~ show that~~ demonstrate whether or not a ~~the~~ racial minority and low-income community would be impacted by the proposed project, whether or not they were ~~was~~ politically powerless in the planning process, and~~ that~~ whether or not they had access to information on and full public participation in the proposed project. As described further in Public Involvement Program, Section 14.0, the public involvement program for this project has been conducted in a manner to reach as many minority and low-income populations as possible. Examples of efforts taken towards this end include community canvassing, a toll free hotline, over 25 community scoping meetings, publishing newsletters, flyers, and advertisements in three languages, providing bilingual translators at community meetings, publishing ads in a full range of newspapers, as well as visiting schools, businesses, and neighborhood association meetings.

7.5.3 Cumulative Impacts

~~According to 2020 population projections developed by SCAG, the number of people residing in the Olympic/Crenshaw station influence area will increase by 3,562 over the 1994 projected census, representing a 28 percent increase over 1994 figures; the number of people residing in the Olympic/Arlington Station influence area will increase by 5,669 over the 1994 projected census, representing a 16 percent increase over 1994 figures; and the number of persons residing in the Pico/ or Venice/San Vicente influence area will increase by 4,453, representing a 16 percent increase over 1994 figures.~~

The proposed project, in connection with the current and planned urban rail as well as commuter rail and freeway express bus improvements, would improve mobility for transit-dependent populations throughout Los Angeles County and the Southern California region. Other urban rail improvements planned or projected for the project area include the Metro Red Line Western Extension (west of the currently proposed Pico/ or Venice/San Vicente Station) and the Crenshaw Boulevard/Prairie Avenue Corridor project.

7.5.4 Mitigation Measures

No Project

Implementation of any of the build alternatives would mitigate the loss of rail access to the transit-dependent populations in the Mid-City area.

Alternatives A and B

No impacts were identified that require mitigation. The impacts to transit-dependent populations would be beneficial, therefore, no mitigation is required.

Alternative C

The MTA will encourage residential redevelopment of the residential properties acquired for this alternative.

7.5.5 Unavoidable Significant Adverse Impacts

Under the No Project Alternative, rail access would not be provided to transit-dependent populations in the project area which would connect people to job opportunities outside of the area and saving them time and money with more efficient transportation service. The loss of this transit benefit is considered a significant adverse impact.

For ~~the four "build"~~ Alternatives A and B no unavoidable significant adverse impacts to transit-dependent, minority, or low-income populations were identified.

The loss of 113 residential units under Alternative C would result in a significant effect to the vacancy rate since it represents a five percent loss in the number of vacant units (113/2,216 = 5%) in the Mid-City area.

7.6 PROPERTY ACQUISITION AND DISPLACEMENT

Introduction

This section analyzes the nature and extent of property acquisitions, and subsequent residential and employee displacement, that would occur as a result of the proposed Metro Red Line Mid-City Segment project. This section identifies the levels of significance of these property acquisitions and the impacts resulting from residential and employee displacement, and proposes mitigation measures designed to alleviate the effects of these acquisitions and displacements. The impacts of residential property acquisitions on housing stock are also examined.

7.6.1 Environmental Setting

Depending on the alternative chosen the Metro Red Line Mid-City Segment would acquire properties on the southwest corner on Olympic and Arlington, on the corner of Crenshaw and Wilshire, on the corner of Olympic and Crenshaw, along Pico Boulevard, and the properties bounded by Pico, West, Venice and San Vicente Boulevards.

Relocation study areas have been defined for this analysis as geographic areas within which displaced residents could be expected to relocate. The State of California's Government Code, Section 7260, et seq., requires a relocating agency to provide relocation expenses for relocating parties as far as 50 miles from the subject property. However, the study areas used for this analysis also examine the potential to relocate displaced persons within their neighborhood or community. The three study areas evaluated in this section are Los Angeles County, the City of Los Angeles, and the Mid-City project area. The Mid-City project area, as defined for purposes of this assessment, encompasses the area bordered generally by Wilshire Boulevard to the north, ~~Western~~ Normandie Avenue to the east, ~~Adams~~ Washington Boulevard to the south, and ~~Fairfax~~ Sycamore Avenue to the west (see Figure 7-17). It is intended to include the area within which displaced residents or businesses might chose to relocate if they wish to remain within the vicinity of their current location.

Los Angeles County

The County of Los Angeles has about 3,163,343 housing units, 173,791 of which are vacant, based on the 1990 U.S. Census. The vacancy rate for Los Angeles County is approximately 5.49 percent.

City of Los Angeles

The City of Los Angeles has 1,299,963 housing units, 82,558 of which are vacant, based on the 1990 U.S. Census. The vacancy rate within the city is approximately 6.35 percent.

Mid-City Project Area

The Mid-City project area has 38,446 housing units, 2,216 of which are vacant, based upon information found in the 1990 U.S. Census. The vacancy rate in this area is 5.76 percent, slightly lower than the city average of 6.35 percent. Household sizes in the census tracts within the project area typically range from two to four persons per housing unit.

Table 7-29 provides information on the existing conditions within the project area, which include the average number of persons per household, the number of overcrowded units, the median household incomes, the median housing values, and the median contract rents. Overcrowding of the housing supply is determined based on the percentage of units with more than two persons per room. The affordability of housing stock is assessed based on median housing values and median contract rents. Housing affordability is defined as monthly housing expenses which do not exceed 30 percent of the median household income.

Table 7-29
Household Characteristics Within the Project Area

Study Area	Average Number of Persons/ Household	More Than Two Persons Per Room						
		Owner Occupied Units		Renter Occupied Units		Median Household Income	Median House Value	Median Rent
		No.	%	No.	%			
L.A. County	3.38	36,911	2	196,279	11	$40,626	$263,054	$662
L.A. City	3.25	13,112	2	103,651	13	$35,932	$284,085	$632
Mid-City Area	3.13	4,879	7	16,538	25	$25,769	$270,785	$536

7.6.2 Project Impacts

Thresholds of Significance Criteria

For the purposes of this SEIS/SEIR, the project would have a significant impact if it were to:

- Acquire sufficient residential properties such that the make-up of the neighborhood character is changed;
- Displace residents in an area where sufficient replacement housing is not available;
- Acquire businesses in an area where sufficient replacement commercial space is not available;
- Displace employees in an area where sufficient employment opportunities is not available; or
- Displace businesses which are: (1) sensitive to the surrounding community due to the relative scarcity of competing services or (2) difficult to relocate due to size or dependency on a particular location for patronage.

Methodology

Current engineering plans were used to determine the extent of property acquisitions associated with each alternative. Land use characteristics of parcels subject to property acquisitions were obtained from Damar, a CD-ROM encoded real estate data base for Los Angeles County produced by TRW-REDI Property Data and supplemented by field surveys performed in May and June 1997. Field surveys were used to determine information unobtainable through use of Damar, such as the number of businesses acquired. Acquired land uses were consolidated into the following categories: single-family residential (SFR), multi-family residential (MFR), commercial/retail, industrial, office, vacant (undeveloped), parking lot, and public/institutional. Public/institutional land uses include government buildings, churches, hospitals, recreational facilities, and schools.

By using parcel information for each property acquired, the total resident and employee displacement for each alternative was estimated. The potential resident displacement due to the project was estimated by multiplying the number of residential units acquired by the average number of persons per household, as listed in the 1990 Census. To estimate the number of employees displaced by each alternative, interviews were held at most businesses or employee density factors which reflect the number of employees per square foot of building space were used. These factors vary according to the type of land use acquired, and were applied to building floor areas obtained from Damar to estimate the employee displacement due to the project. The application of these employee factors may exaggerate employees of businesses connected to residential structures and may underestimate employees of businesses housed in very small shops. In addition, the use of these factors reflects full-time employees only and may underestimate the number of part-time employees who may be displaced.

Project Impacts

No Project

The No Project Alternative would not result in the acquisition of private property and displacement of residents and businesses.

Alternative A (Wilton/Arlington/Pico)

The extension of Metro Red Line from the Wilshire/Western Station to the proposed Pico/San Vicente site would result in the acquisition of residential and commercial properties primarily along Olympic Boulevard, Arlington Avenue, Westchester Place, West Boulevard, and Pico Boulevard. Consequently, residents and employees would be displaced. The number of required acquisitions could increase or decrease during final design and engineering.

Acquisitions for the Olympic/Arlington Station would be required to provide a station plaza/entrance and construction staging area at the southwest corner of the Olympic/Arlington intersection. Acquisitions for the Pico/San Vicente Station would be required to provide a station plaza/entrance, underground station box and tail track, parking and bus transfer facilities, and for use as the project's main construction staging area. An additional property on the southeast corner of Pico and West Boulevards would be acquired to relocate a storm drain.

Residential Acquisitions and Resident Displacement

This alternative would result in the displacement of residents due to the acquisition of single-family and multi-family residences. Based on preliminary engineering drawings (see Figure 2-3), it is estimated that 3 single-family residential units would be acquired at the Olympic/Arlington Station site. Estimating 3.13 persons per unit (see Table 7-29), 9 people would be displaced (see Table 7-30). Residential acquisitions for the Pico/San Vicente Station include 45 multi-family residential units within 4 apartment buildings, including four apartments on the second floor of a commercial building. These residential acquisitions would displace an estimated 140 people (45 X 3.13) (see Table 7-30). In total, Alternative A would acquire 3 single-family residences, 3 multi-family buildings, and 4 apartments on the second floor of a commercial building. These acquisitions would displace an estimated 149 residents. Since there is adequate replacement housing available in the area (2,216 vacancies in the Mid-City area, see Section 7.5 - Vacancy Rates), these residential acquisitions and resident displacements are not considered a significant effect. The loss of 3 single-family residential units and 45 multi-family dwelling units in 3 buildings (plus one commercial building) is not considered significant ~~on a regional basis~~ since it represents less than one-half of one-percent of the ~~regional~~ Mid-City area housing stock (see Section 7.5 - Vacancy Rates and Table 7-30).

Where acquisition and relocation are unavoidable, the MTA would follow applicable provisions of federal law, including the Uniform Act as amended, and as implemented by the Uniform Relocation Assistance and Real Property Acquisition Regulations for Federal and Federally Assisted Programs adopted by the Department of Transportation, dated March 2, 1989, and applicable provisions of state law, including those discussed below.

Table 7-30
Estimated Number of Property Acquisitions and Displacements by Alternative

Alternative	Location	Single-Family Residential	Multi-Family Residential	Business: Bldgs.	Business: Businesses	Vacant Lot	Parking Lots	Public[1]	Employees[2]	# of Units	Residents	Property Tax
A	Olympic/Arlington Station Site	3[7]	0	3	12	0	1	1[4]	38	0	9	$45,226
	Pico/San Vicente Station Site	0	3[5]	9[6]	8	4	1	2	182	45	140	$106,108
	Utility Relocations	0	0	1	2	0	0	0	13	0	0	$4,478
	Total	3	3	13	22	4	2	3	233	45	149	$155,812
B	Olympic/Arlington Station Site	3[7]	0	3	12	0	1	1[4]	38	0	9	$45,226
	Venice/San Vicente Station Site	0	3[5]	8	8	4	1	1	147	45	140	$106,108
	Total	3	3	11	20	4	2	2	185	45	149	$151,334
C[3]	Construction Staging Area - West side of Crenshaw Boulevard	9	8	1	0	1	2	1	5	39	144	$32,380
	Olympic/Crenshaw Station Site	0	0	5	11	0	1	0	35	0	0	$20,748
	Pico/San Vicente Station Site	0	4[5]	9	8	4	1	2	182	45	140	$106,108
	Utility Relocations	15	1	3	5	0	0	1	60	5	60	$4,478
	Vents Shafts	0	0	1	1	1	0	0	18	0	0	***
	Total	24	13	19	25	6	4	4	300	89	344	$163,714

1 Public = Public Institutions including: recreational facilities, schools, and churches
2 Does not include employees of the Eleanor Green Roberts Aquatic Center, 4526 W. Pico Boulevard.
3 Information for Utility Relocations and Vent Shafts for Alternative C was compiled by Myra Frank & Associates, except for the Property Tax.
4 True Hope Church located on 2nd floor of the commercial building at 1011 S. Arlington Avenue.
5 One of the commercial buildings has residential apartments on the 2nd floor.
6 One of the commercial buildings houses a church.
7 This is a worst case scenario; it is likely that only 3 single-family residential properties would be acquired, 2 on Arlington Avenue and 1 on Westchester Place.
*** Unknown.

The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646, 84 Stat.1894), as amended by Section 7 of the Federal Transit Act of 1992 (49 USC Section 1606), mandates that certain relocation services and payments by the Los Angeles County MTA be made available to eligible residents, businesses and nonprofit organizations displaced by construction and operation of MTA transit-related projects. The Act provides for uniform and equitable treatment of persons displaced from their homes, businesses or farms by federal and federally assisted programs; and establishes uniform and equitable land acquisition policies.

The State of California's Government Code Section 7260, et seq. brings the California Relocation Act into conformity with the Federal Uniform Relocation Act. In the acquisition of real property by a public agency, both the federal and state acts seek to: (1) ensure consistent and fair treatment for owners of real property; (2) encourage and expedite acquisition by agreement to avoid litigation and relieve congestion in the courts; and (3) promote confidence in public land acquisition.

Owners of private property have federal and state constitutional guarantees that their property will not be taken or damaged for public use unless they first receive just compensation. Just compensation is measured by the "fair market value" of the property taken, defined as follows:

> "The fair market value of the property taken is the highest price on the date of valuation that would be agreed to by a seller, being willing to sell but under no particular or urgent necessity for so doing, nor obliged to sell, and a buyer, being ready, willing and able to buy but under no particular necessity for so doing, each dealing with the other with the full knowledge of all the uses and purposes for which the property is reasonably adaptable and available" [Code of Civil Procedure Section 1263.320(a)].

Commercial Acquisitions and Employee Displacement

Alternative A would result in the displacement of employees due to the acquisition of commercial properties. Three commercial properties would be acquired for the Olympic/Arlington Station. These three commercial properties include a used car dealership (Olympic Auto Mart), two beauty salons (Perm Beauty Salon and Gagopa Beauty Salon) and one church (True Hope Church) located in the same building, and a two-story medical office building (KOA Medical Center) that houses 9 different medical practices. It is estimated that approximately 45 employees would be displaced (see Table 7-30).

The Pico/San Vicente Station would require the acquisition of all the businesses located within the block bounded by Pico, San Vicente, Venice, and West Boulevards. In total, 9 commercial properties housing 8 businesses, the Eleanor Green Roberts Aquatic Center, and one church would be acquired. The acquisition of these commercial properties would displace an estimated 182 employees. The relocation of the storm drain south of Pico Boulevard would require the acquisition of one commercial properties housing two businesses and displace 13 employees on the southeast corner of Pico and West Boulevards (see Table 7-30).

The loss of 2 of these commercial properties, Builder's Discount and the Eleanor Green Roberts Aquatic Center, is of particular concern. These 2 businesses (one private and one public) provide unique services to the surrounding community, and would be difficult to relocate given their size and the relative scarcity of large, vacant properties within the area. Therefore, the acquisition of these 2 businesses would be considered a significant impact. The MTA has made a commitment to provide for the relocation of the pool facility within the immediate area, and is currently discussing relocation alternatives with the City of Los Angeles Department of Recreation and Parks. See Appendix D for the consultation letters between the MTA and the Department of Recreation and Parks to-date.

The displacement of employees is not considered a significant impact because it is expected that most of the displaced businesses would be able to relocate within the immediate area. Employees of those businesses that do not relocate in the immediate area should be able to find new employment within the Mid-City area.

Easements

Alternative A would require approximately 79 easements as shown below:

Section of Alignment	No. of Easements
Between the Wilshire/Western Station and the Olympic/Arlington Station	52
Between the Olympic/Arlington Station and the Pico/San Vicente Station	27
	79

Alternative B (Wilton/Arlington/Venice)

For the Olympic/Arlington Station, the effects of residential and commercial acquisition and resident and employee displacement are the same as described for Alternative A (see Table 7-30).

For the Venice/San Vicente Station, the effects of residential acquisition and resident displacement are the same as described for Alternative A. The effects of commercial properties acquisition and employee displacement at the Venice/San Vicente Station are somewhat less than the effects of the Pico/San Vicente Station (see Table 7-30). Since the Venice/San Vicente Station would be located on the south side of the site, it would not require the acquisition of the Eleanor Green Roberts Aquatic Center. It would still require the acquisition of the Builder's Discount property. In addition, the Venice/San Vicente Station would not require the acquisition of the property on the southeast corner of Pico and West Boulevards because the storm drain would not have to be relocated off-site. Even though the Venice/San Vicente Station would require fewer acquisitions than the Pico/San Vicente Station, it would still create a potential significant effect due to the acquisition and displacement of Builder's Discount. The displacement of employees is not considered a significant impact because it is expected that most of the displaced businesses would be able to relocate within the immediate area. Employees of those businesses that do not relocate in the immediate area should be able to find new employment within the Mid-City area.

Easements

Alternative B would require approximately 93 easements as shown below:

Section of Alignment	No. of Easements
Between the Wilshire/Western Station and the Olympic/Arlington Station	52
Between the Olympic/Arlington Station and the Venice/San Vicente Station	41
	93

Alternative C (Crenshaw/Pico)

The extension of Metro Red Line from the Wilshire/Western Station to the proposed Pico/San Vicente site would result in the acquisition of residential and commercial properties primarily along Crenshaw and Pico Boulevards. Consequently, residents and employees would be displaced. The number of required acquisitions could increase or decrease during final design and engineering.

Acquisitions for the Olympic/Crenshaw Station would be required to provide station plazas/entrances at the northeast and southwest corners of the Olympic/Crenshaw intersection, and for construction staging areas. Acquisitions for the Pico/San Vicente Station would be required to provide a station plaza/entrance, underground station box and tail track, parking and bus transfer facilities, and for use as the project's main construction staging area. In addition, the relocation of utility lines (sewer lines and storm drains) and the installation of vent structures would require the acquisition of property.

Residential Acquisitions and Resident Displacement

Alternative C would result in the displacement of residents due to the acquisition of single-family residences and multi-family buildings. Alternative C would acquire 9 single-family residences and 8 multi-family buildings with 39 units to establish the construction staging area on the west side of Crenshaw Boulevard between Wilshire Boulevard and 8th Street. It would acquire 15 single-family residences and 1 multi-family buildings with 5 units to relocate utilities. Residential acquisitions for the Pico/San Vicente Station include 45 multi-family residential units within 3 apartment buildings, plus 4 apartments on the second floor of a commercial building. Altogether, Alternative C would require the acquisition of 24 single-family residences and 13 multi-family buildings with 89 dwelling units, or a total of 113 housing units. An estimated 344 residents would be displaced (see Table 7-30). ~~Since there is adequate housing available in the immediate area, these residential acquisitions and resident displacements would not be considered a significant affect.~~ The loss of 24 single-family residential units and 89 multi-family dwelling units is not considered significant ~~on a regional basis~~ since it represents less than one-half of one-percent of the ~~regional~~ Mid-City area housing stock.

Commercial Acquisitions and Employee Displacement

Alternative C would require the acquisition of one commercial building to establish the construction staging area on the west side of Crenshaw Boulevard between Wilshire Boulevard and 8th Street. It would acquire 3 commercial buildings housing 5 businesses to relocate utilities. Commercial acquisitions for the Pico/San Vicente Station include 9 commercial buildings housing 8 businesses. Construction of the vent shafts would require the acquisition of one commercial building housing one business. Commercial acquisitions for the Olympic/Crenshaw Station include 5 commercial buildings housing 11 businesses. Altogether, Alternative C would require the acquisition of 19 commercial buildings housing 25 businesses. An estimated 300 employees would be displaced (see Table 7-30). The displacement of employees is not considered a significant impact because it is expected that most of the displaced businesses would be able to relocate within the immediate area. Employees of those businesses that do not relocate in the immediate area should be able to find new employment within the Mid-City area.

Alternative C would have the same effects on Builder's Discount and the City of Los Angeles Department of Recreation and Parks Eleanor Green Roberts Aquatic Center as described above for Alternative A.

Easements

Alternative C would require approximately 52 easements as shown below:

Section of Alignment	No. of Easements
Between the Wilshire/Western Station and the Olympic/Crenshaw Station	23
Between the Olympic/Crenshaw Station and the Pico/San Vicente Station	29
	52

All Alternatives

Table 7-31 graphically displays the property easements, acquisitions, and displacements for each alternative.

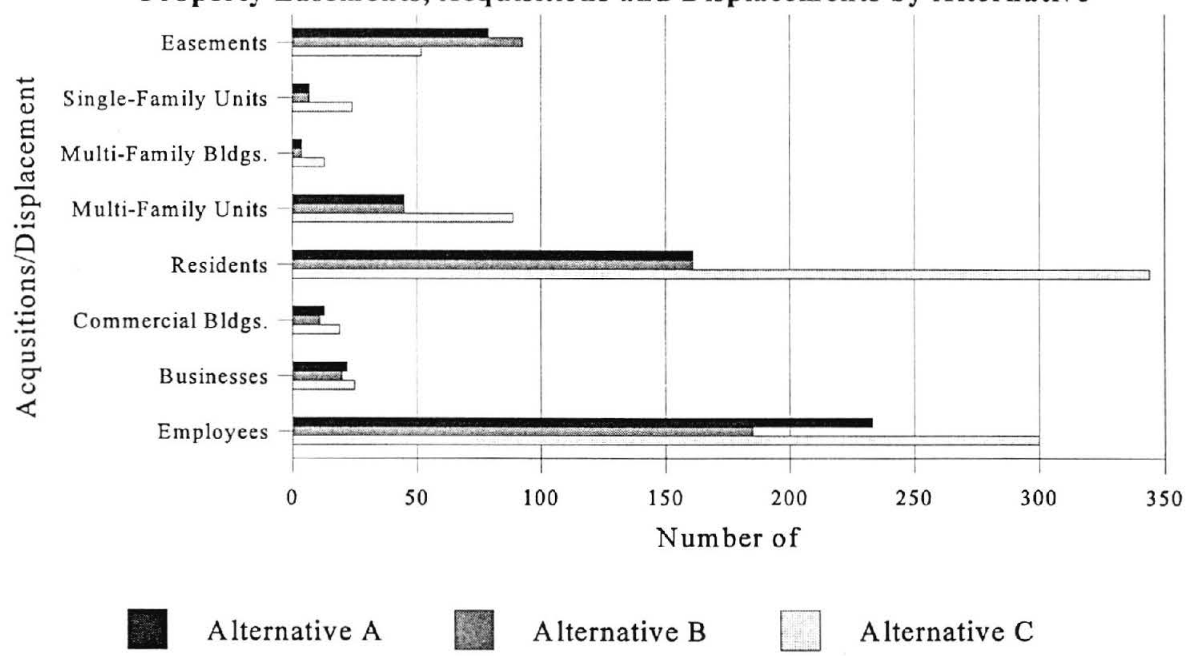
7.6.3 Cumulative Impacts

The Metro Red Line Mid-City Segment project, along with other related projects in the vicinity of the project alignment, would require the acquisition of property. These other projects include the proposed Metro Red Line Western Extension and the potential Crenshaw-Prairie Line. In addition, general growth in the area would typically involve some demolition of existing structures. The acquisitions from these projects and general growth could potentially have a cumulative impact upon: (1) the available housing stock if the existing vacancy rates in the Mid-City project area were substantially reduced and (2) the surrounding community if substantial numbers of businesses were considered sensitive to the area due to the relative scarcity of competing services.

The number of property acquisitions that would be required for the other projects in the area is unknown at this time. The current vacancy rate would not only be affected by planned projects and general growth, but also by other unknown variables such as the regional and local economies and the real estate market. The Mid-City project area does not appear to have a high demand for housing (vacancy rate is greater than five percent). Therefore, a substantial number of acquisitions would be required to result in significant cumulative impacts on the housing stock.

Table 7-31

Property Easements, Acquisitions and Displacements by Alternative



7.6.4 Mitigation Measures

Residential Acquisitions and Resident Displacement

1. The MTA will apply acquisition and relocation policies to assure compliance with the Uniform Act and Amendments. All real property acquired by the MTA will be appraised to determine its fair market value. An offer of just compensation, which shall not be less than the approved appraisal, will be made to each property owner. Each homeowner, renter, business, or nonprofit organization displaced as a result of the project will be given advanced written notice and would be informed of the eligibility requirements for relocation assistance and payments.

2. Pursuant to the Uniform Relocation Act MTA will make referrals to ~~provide~~ comparable, decent, safe and sanitary replacement housing which is within a person's financial means before that person is displaced. In the event that such replacement housing is not available to "re-house" persons displaced by the project within the statutory limits for replacement housing payments, the MTA will provide Last Resort Housing in a number of ways, including:

   - Rehabilitating or constructing additions to existing replacement dwellings and making them available to the displaced person;
   - Constructing new housing to be rented or sold to displaced persons for amounts within their financial means;
   - Physically relocating comparable dwellings to replacement site;
   - Purchasing existing housing to be rented or sold to displaced persons for amounts within their financial means;
   - Removing barriers or rehabilitating structures to accommodate handicapped displaced persons when suitable replacement housing is not available;
   - Making replacement housing payments in excess of the statutory limits of $22,500 for owner/occupants and $5,250 for renters.
   - Offering a direct loan, or other financing techniques, to assist displaced persons in purchasing comparable replacement dwellings.

3. All eligible displaced persons have freedom of choice in the selection of comparable replacement housing, and the MTA will not require any displaced person, without his/her written consent, to accept a replacement dwelling referral ~~provided~~ by the MTA. If a displaced person decides not to accept the replacement housing referred ~~offered~~ by the MTA, the displaced person may secure a comparable replacement dwelling of his/her choice, providing it meets decent, safe, and sanitary housing standards.

Commercial Acquisitions and Employee Displacement

4. ~~Pursuant to existing State and federal law,~~ The MTA's Public Affairs Team will establish a program to assist all displaced businesses that desire to relocate in the immediate area in locating comparable, decent, safe and sanitary replacement commercial space which is within a business' financial means before that business is displaced.

5. ~~Pursuant to existing State and federal law,~~ The MTA's Public Affairs Team will establish a program to assist all displaced employees who lose their job due to MTA's acquisition of commercial property with employment assistance.

7.6.5 Unavoidable Significant Adverse Impacts

With regard to residential and commercial acquisition and displacement, the ~~four~~ "build" alternatives would not have a significant impact after mitigation. Implementation and adherence to the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 and its amendments would provide equitable treatment, compensation, and relocation assistance to homeowners, renters, businesses, and non-profit organizations displaced by the project.

The displaced Builder's Discount business may not be able to relocate within the project area due to the scarcity of large vacant properties. Because this business provides unique services to the community, its displacement may remain an unavoidable significant adverse impact if it cannot be relocated within the immediate area.

Alternatives A and C would have to relocate the Eleanor Green Roberts Aquatic Center. If this community swimming pool facility is not relocated within the Mid-City area it will result in an unavoidable significant adverse impact. The MTA is negotiating in good faith with the City of Los Angeles Recreation and Parks Department should the relocation of this community facility become necessary. Alternative B does not result in this potential unavoidable significant adverse impact.

7.7 BUSINESS DISRUPTION DURING CONSTRUCTION

The purpose of this section is to review the possible impacts that construction of the Proposed project would have on existing commercial (i.e., retail and office) establishments adjacent to or near construction sites.

7.7.1 Environmental Setting

Commercial activity within the project area generally occurs along the major north-south and east-west corridors of Wilshire, Crenshaw, Olympic, Pico, and Venice Boulevards. Wilton Place and Arlington Avenue do not have a large number of commercial uses. The types of commercial activities along these commercial corridors range from small service businesses and retail shops to large office buildings. Major businesses along Crenshaw Boulevard include the offices of the Legal Aid Foundation, three multi-tenant office buildings, and a large athletic facility. El Centro de Proteccion Legal, an immigration law center, and a small concentration of automobile service centers, as well as other small businesses, are located on Pico Boulevard. Olympic Boulevard has commercial uses near its intersections with Crenshaw Boulevard and Wilton Place/Arlington Avenue. A Korean TV Station (Hanmi TV, KATV, Channel 52) is located on the northwest corner of Olympic Boulevard and Wilton Place/Arlington Avenue~~, 3511 West Olympic Boulevard~~. Builders Discount, El Centro de Proteccion Legal, an immigration law center, and a small concentration of automobile service centers, as well as other small businesses, are located on Pico Boulevard between Crenshaw and San Vicente Boulevards.~~ The Eleanor Green Roberts Aquatic Center, a community swimming pool operated by the City of Los Angeles Department of Recreation and Parks, is also located on this section of Pico Boulevard.~~

7.7.2 Project Impacts

Thresholds of Significance Criteria

A significant business disruption impact would result if an alternative would:

- Block or otherwise affect access to the business such that the business could not be maintained or the business could not be operated in a normal.

Construction Impacts

No Project Alternative

The No Project Alternative would not have a physical environmental effect on existing businesses in the project area.

Alternative A (Wilton/Arlington/Pico)

As described throughout the different sections of this document, construction activities would produce physical impacts near station sites. The impacts would occur near the cut-and-cover segments of the tunnel alignment, ~~for tunnels and utility relocations, and~~ utility relocations, and where the tunnel boring machine (TBM) would be removed from under Wilshire Boulevard. Alternative A would construct stations at the Olympic Boulevard/ Arlington Avenue intersection and just east of the Pico/San Vicente Boulevards intersection. ~~It would require~~ Cut-and-cover construction methods would be implemented in Pico Boulevard between Victoria Avenue and the Pico/ San Vicente Station, in Crenshaw Boulevard (for 100 feet north and south of Pico Boulevard), and within Queen Anne Place between Pico Boulevard and the Queen Anne Recreation Center. The TBM could be removed from under Wilshire Boulevard near Manhattan Place. The construction activities associated with Alternative A would disrupt businesses in close proximity to these locations.

The potential construction impacts include: modified vehicular and pedestrian traffic patterns, increased noise and vibration, dust, and building settlement (for specific information on these impacts see Sections 7.2, Traffic; 7.12, Air Quality; 7.11, Noise and Vibration; and 7.15, Geology and Subsurface Conditions). Other physical impacts upon businesses along these corridors could include reduced visibility of signs or the business structures themselves, reduced accessibility, and reduced availability of parking.

Construction of the Olympic/Arlington Station would effect the businesses near this intersection. Construction of this station would displace three existing businesses on the southwest corner of the Olympic/Arlington intersection. This displacement is fully described in Section 7.6 of this document. The remaining businesses near this intersection include: a liquor store/mart, a two-story commercial building housing an acupuncture/herbs business and a tax/consulting business, a wedding dress/flower shop, a Korean TV Station and other professional uses in a four-story commercial office building, a Buddhist Temple, a Unocal Gas Station, and another acupuncture/herbs business. Tunneling activities would occur directly underneath the Korean TV Station and the Buddhist Temple. Tunneling activities would effect the ability of these uses to operate in a normal manner.

The Pico/San Vicente Station would displace all of the existing commercial businesses located between Pico, San Vicente, Venice, and West Boulevards to make room for the construction staging area for the proposed project and the eventual construction of the station, and to construct the underground station, tail tracks, and park-and-ride structure. Please refer to section 7.6 for a complete description of the acquisition and displacement of businesses for this station site. Establishing a construction staging area on this property would have an effect on the businesses located along Pico Boulevard in close proximity to this site. In addition to the effects mentioned above, these businesses would be exposed to a number of large construction truck traffic trips that would be removing excavated material from the site. Seventeen commercial retail businesses on the north side of Pico Boulevard across from the site would be effected ~~disrupted~~ by construction activities including: increased truck traffic, modified vehicular and pedestrian traffic patterns, increased noise and vibration, and dust ~~on the site~~.

The cut-and-cover construction in Pico Boulevard between Victoria Avenue and West Boulevard ~~the Pico/San Vicente Station~~ would disrupt the businesses located along this commercial street. The initial installation of the street decking and its ultimate removal are the two periods during which the businesses would be affected the most. Once the temporary street decking is in place the effects would be reduced, but not eliminated. The types of effects that could occur are described above. Existing traffic along Pico Boulevard would be maintained with the use of decking, but the number of available on-street parking spaces could be reduced. Although there may be some lane diversions or lane reductions during some phases of construction, complete closure of Pico Boulevard and affected cross streets is anticipated to be minimal. Pedestrian and vehicular access to existing businesses would be maintained during construction. The cut-and-cover construction activity in Pico Boulevard between Victoria Avenue and West Boulevard would disrupt 27 commercial retail stores, 4 churches, 2 pre-schools, one multi-family residential unit, 3 commercial manufacturing businesses, one motel/hotel, and 5 professional offices.

The cut-and cover construction activities required to relocate the sewer in Crenshaw Boulevard would disrupt those businesses within 100 feet of Pico Boulevard.

The removal of the TBM from under Wilshire Boulevard could have an effect on the businesses that are located near this construction site. One TBM would be removed at a time thereby limiting the effects to one side of the street or the other. The types of effects that could include: modified vehicular and pedestrian traffic patterns, increased noise and vibration, and dust ~~occur are described above~~.

Alternative B (Wilton/Arlington/Venice)

Alternative B would construct stations at Olympic Boulevard and Arlington Avenue, and just east of the Venice/San Vicente Boulevards intersection. It would require cut-and-cover construction in Venice Boulevard between Victoria Avenue and just west of West Boulevard ~~the Venice/San Vicente Station~~, and in Crenshaw Boulevard (for 100 feet on each side of Venice Boulevard). The TBM could be removed from within Wilshire Boulevard between Manhattan Place and Western Avenue.

The business disruption effects of constructing the Olympic/Arlington Station are the same as described above under Alternative A. ~~The cut-and-cover construction activity in Venice Boulevard between Victoria Avenue and the Venice/San Vicente Station would disrupt the businesses on the west side of Crenshaw Boulevard that front onto Venice Boulevard. No disruption to businesses on Venice Boulevard would occur.~~

The cut-and-cover construction activities in Venice Boulevard between Victoria Avenue and the Venice/San Vicente Station could cause a minor disruption to the eleven businesses located to the east near the Venice/ Crenshaw Boulevards intersection. The initial installation of the street decking and its ultimate removal are the two periods during which the businesses would be effected the most. Once the temporary street decking is in place the effects would be reduced, but not eliminated. The types of effects that could include: modified vehicular and pedestrian traffic patterns, increased noise and vibration, and dust ~~occur are described above~~. Although there may be some lane diversions or lane reductions during some phases of construction, complete closure of Venice Boulevard is anticipated to be minimal. Pedestrian and vehicular access to existing businesses would be maintained during construction.

~~The Venice/San Vicente Station would displace all of the existing commercial businesses located between Pico, San Vicente, Venice, and West Boulevards to make room for the construction staging area for the proposed project. Only the Eleanor Green Roberts Aquatic Center would remain in its existing location on the site. Please refer to section 7.6 for a complete description of the acquisition and displacement of businesses for this station site. Seventeen commercial retail businesses on the north side of Pico Boulevard across from the site would be disrupted by construction activities on the site.~~ The business disruption effects of constructing the Venice/San Vicente Station are the same as described above for the Pico/San Vicente Station under Alternative A.

The cut-and-cover construction required to relocate the sewer in Crenshaw Boulevard would disrupt those businesses within 100 feet of Venice Boulevard.

The business disruption effects of removing the TBM within Wilshire Boulevard are the same as described above under Alternative A.

Alternative C (Crenshaw/Pico)

Alternative C would construct stations at Olympic/Crenshaw Boulevards and Pico/San Vicente Boulevards. ~~It would require~~ Businesses in close proximity to the cut-and-cover construction activities in Crenshaw Boulevard between 8th Street and a point approximately 1,100 feet south of Country Club Drive, ~~and~~ in Pico Boulevard between Victoria Avenue and the Pico/San Vicente Station, and where the TBM could be removed from under Wilshire Boulevard ~~at a point~~ near Manhattan Place, unless the construction company that owns the machines decides to leave them in place, ~~The construction of Alternative C~~ would be ~~potentially~~ disrupted ~~businesses in close proximity to these locations~~.

Construction of the Olympic/Crenshaw Station could affect the businesses near this intersection. Construction of this station would displace existing businesses on the southwest and northeast corners of the Olympic/Crenshaw intersection. This displacement is fully described in Section 7.6 of this document. The potential construction impacts include: modified vehicular and pedestrian traffic patterns, increased noise and vibration, dust, and building settlement (see Sections 7.2, Traffic; 7.12, Air Quality; 7.11, Noise and Vibration; and 7.15, Geology and Subsurface Conditions). Other physical impacts upon businesses along these corridors could include reduced visibility (of signs or the business structures themselves), reduced accessibility, and reduced availability of parking.

Cut-and-cover construction to relocate storm drains and sewer lines within the residential neighborhoods would require the acquisition and demolition of one business in the 1100 block of Crenshaw ~~not disrupt businesses, except possibly where they would cross either Crenshaw, Olympic, or Pico~~ Boulevard~~s~~.

The business disruption effects of constructing the Pico/San Vicente Station are the same as described above under Alternative A.

The cut-and-cover construction in Crenshaw Boulevard between 8th Street and a point approximately 1,100 feet south of Country Club Drive would disrupt the businesses located along this stretch of commercial properties. The initial installation of the street decking and its ultimate removal are the two periods during which the businesses would be effected the most. Once the temporary street decking is in place the effects would be reduced, but not eliminated. The types of effects that could occur are described above. Seventy-nine businesses would be subject to business disruption associated with construction in this corridor (this number excludes existing businesses that would be displaced). The 79 businesses can be categorized as follows: 22 service-oriented; 14 wholesale/retail; 14 medical/acupuncture; 15 general office; 12 financial, insurance, or real estate; one convalescent hospital; and one motor inn. These businesses include Hansohl Healthland, a two-story athletic facility with a swimming pool, golf driving range, and off-street parking; the Hansohl Healthland building also has four small retail businesses as tenants, as well. At the most southern point of the cut-and-cover construction stands the last commercial structure on the corridor, the Crenshaw Friendship Inn, a ranch-style neighborhood motel. There are also four businesses along Olympic Boulevard which could be disrupted as a result of their adjacency to the proposed station entrance sites. There is a social club and a small market adjacent to the site on the northeastern corner of Olympic and Crenshaw Boulevards and there are two auto service centers adjacent to the site on the southwest corner of Olympic and Crenshaw Boulevards. Existing traffic along Crenshaw Boulevard would be maintained with the use of decking, but the number of available on-street parking spaces could be reduced. Although there may be some lane diversions or lane reductions during some phases of construction, complete closure of Crenshaw Boulevard and affected cross streets is anticipated to be minimal. Pedestrian and vehicular access to existing businesses would be maintained during construction.

The business disruption effects of cut-and-cover construction in Pico Boulevard between Victoria Avenue and the Pico/San Vicente Station are the same as described above under Alternative A.

The business disruption effects of removing the TBM within Wilshire Boulevard are the same as described above under Alternative A.

7.7.3 Cumulative Impacts

The two transit extension related projects (Future Western Extension of the Red Line and Crenshaw/Prairie Line) would reintroduce construction activities at and around the Pico/ or Venice/San Vicente Station site. These two related transit projects are far removed in timing from the proposed project and therefore would not produce cumulative business disruption impacts. There are no other known redevelopment projects in close proximity to the project area; and the "Other Projects Proposed Within the Vicinity" should all be completed before construction begins on this project. Therefore, no significant cumulative business disruption impacts should be associated with the proposed project.

7.7.4 Mitigation Measures

1. Prior to and during construction of the Mid-City Segment, the MTA will contact and interview individual businesses potentially effected by construction activities, and maintain appropriate records. Interviews with commercial establishments will provide MTA staff knowledge and understanding of how these businesses carry out their work, and will identify business usage, delivery, and shipping patterns and critical times of the day and year for business activities. Data gathered from these interviews will also assist the MTA as it works with the Los Angeles Department of Transportation and the Los Angeles Department of Public Works to develop the Worksite Traffic Control plans. Among other elements, these plans will identify alternate access routes to maintain critical business activities.

2. The MTA will establish a "Public Affairs Program" that will be responsible for implementing the following actions:

   - Convey construction information to the community in a timely manner so as to minimize the potential disruption to businesses.
   - Develop a process that will enable the community to "speak" to the MTA during construction that includes a specific mechanism for responding to community concerns in a timely manner.
   - All MTA responses to community concerns will be coordinated with the construction team.

3. Taking into consideration the potentially adverse impacts that construction impacts could have on businesses, the following mitigation measures will be implemented. The following measures will be tailored to meet specific construction site needs. These measures will be implemented through the use of construction contract drawings, specifications, and public affairs programs. The MTA will work with community residents, elected officials, local businesses, and community organizations to tailor the mitigation program to meet community needs in a Mid-City Business Disruption Mitigation Plan (BDMP) prepared by MTA staff prior to the commencement of construction activities. A copy of the Mid-City BDMP will be placed in the Mid-City Metro Information Field Office for public viewing. MTA will inform the public of its progress in implementing the measures identified through a quarterly program of auditing, monitoring, and reporting. A quarterly status report will be made available to the public. MTA shall appoint a staff person to work directly with the public to resolve construction-related problems.

The following mitigation measures are optional elements of the Mid-City BDMP. Their applicability and necessity for the Mid-City area will be reviewed prior to commencement of construction.

- **Construction Site and Field Offices**

4. During construction of the project, MTA staff will establish Metro information field office located along the Mid-City Segment. The field office, in conjunction with other MTA staff, will serve multiple purposes, including:

   - respond/address community/business needs during the construction period,
   - respond to complaints lodged by the public and construction claims,
   - allow MTA to participate in local events in an effort to promote public awareness of the project,
   - manage construction-related matters pertaining to the public,
   - notify property owners, residences, and businesses of major construction activities,
   - provide literature to the public and press,
   - promote and provide presentations on the project via MTA's Speaker Bureau,
   - respond to phone inquires,

- coordinate business outreach programs,
- schedule promotional displays, and
- participate in community committees.

5. The Metro information offices will be open various days of the work week for the duration of the construction period. A schedule will be developed before construction begins, and included in the Mid-City Business Disruption Plan and reported in the quarterly Mitigation Measures Status Report provided to the FTA.

- **Information Line**

6. An information and voice mail telephone line will be available to provide community members and businesses the opportunity to express their views regarding construction. Calls received will be reviewed by MTA staff and will, as appropriate, be forwarded to the necessary party for action (e.g., utility company, fire department, Resident Engineer in charge of construction operations). Information available from the telephone line should include current project schedule, dates for upcoming community meetings, notice of construction impacts, individual problem solving, construction complaints, and general information.

- **Advertisements**

7. The MTA will provide trilingual English/Spanish/Korean advertisements for local print and radio for affected businesses. In addition, a trilingual English/Spanish/Korean construction update will be available regularly throughout the community at least once a quarter.

- **Business Support Programs**

8. The MTA will provide affected businesses with the support needed to implement promotions designed to help maintain their customary level of business.

- **Signage**

9. The MTA will work with establishments affected by the Mid-City Segment construction activities. Appropriate signage will be developed and displayed by the MTA to direct both pedestrian and vehicular traffic to businesses via alternate routes.

- **Traffic Management Plans**

10. Traffic management plans to maintain access to all businesses will be prepared for all project construction areas.

11. In addition, daily cleaning of work areas will be performed by contractors for the duration of the construction period.

12. Provisions will be contained in construction contracts to require the maintenance of driveway access to businesses to the extent feasible.

- **Deck Level**

13. To the extent feasible, the Mid-City Segment, concrete decking along the cut-and-cover segments will be installed flush with the existing street or sidewalk levels.

- **Sidewalk Design and Maintenance During Construction**

14. Wherever feasible, sidewalks will be maintained at their current width during construction. Where a sidewalk must be temporarily narrowed during construction (e.g., deck installation), it will be restored to its current width during the majority of the construction period. Each sidewalk design will be of good quality and be approved by the MTA Resident Engineer prior to construction. Handicapped access will be maintained during construction where feasible.

- **Construction Site Fencing During Construction**

15. Construction site fencing will be of good quality, capable of supporting the accidental application of the weight of an adult without collapse or major deformation. Fence designs or samples will be submitted to the MTA Resident Engineer for approval prior to installation. Where major boulevards must be fenced, business owners will be offered the opportunity to request covered walkways in lieu of chain-link fencing. Where covered walkways or solid surface fences are installed, a program will be implemented to allow for art work (e.g., by local students) on the surface(s). Where used, chain link fences will have slats that will be maintained in clean repair.

- **Construction Site Maintenance**

16. The construction site will be maintained in a neat manner, with all trash collected daily, all wood and pipes stacked neatly, and all small parts stored in closed containers.

- **Construction Impact Loan Program**

17. The current MTA construction impact loan program will be reviewed by the MTA to determine its possible application and effectiveness for the local businesses that would be affected by Mid-City Segment construction.

- **Temporary Relocation/Subsidy**

18. It may be necessary to temporarily relocate immediately affected owners and occupants of businesses or provide a rent subsidy if, for example, access to the business could not be maintained or the business could not be operated in a normal manner. These options will be explored by MTA staff if the need arises.

7.7.5 Unavoidable Significant Adverse Impacts

With implementation of the abovementioned mitigation measures, it is possible that unavoidable significant adverse business disruption impacts would still occur during the construction of the Red Line Mid-City Segment. These disruptions are likely to occur at the following locations:

Alternatives A, B1, and B2

On the northwest corner of Olympic Boulevard and Wilton Place the normal business operations of the Korean TV Station ~~and the Buddhist Temple~~ could be effected.

Alternatives A and C

Cut-and-cover construction (during the installation and removal of the concrete street decking) on Pico Boulevard between Victoria Avenue and West Boulevard ~~the Pico/San Vicente Station~~ would affect the normal business operations of the businesses along this commercial strip.

Alternative C

Cut-and-cover construction (during the installation and removal of the concrete street decking) on Crenshaw Boulevard from 8th Street to a point 1,100 feet south of Country Club Drive would affect the normal business operations of the businesses along this commercial strip.

Alternatives A, B1, B2, and C

Construction activities on the construction staging area south of Pico Boulevard between San Vicente and West Boulevards would affect the businesses on the north side of the street along this commercial strip. The potential removal of the TBM from within Wilshire Boulevard immediately west of Western Avenue would also affect the businesses along this commercial strip for approximately two months..

7.8 COMMUNITIES AND COMMUNITY FACILITIES

7.8.1 Environmental Setting

A number of factors help define community/neighborhood boundaries. Among these are existing physical boundaries and community facilities that serve to bring a community together.

Physical Boundaries

Physical boundaries that can define neighborhoods include major arterials, particularly those with high traffic volumes (greater than 15,000 cars per day). In the vicinity of the proposed project these are Wilshire Boulevard, Olympic Boulevard, Pico Boulevard, Venice Boulevard, and Crenshaw Boulevard. In addition, the topography of the area with the bluffs to the south of Venice Boulevard presents a physical barrier.

~~The area north of Venice Boulevard, south of Pico Boulevard, east of La Brea Avenue and west of West Boulevard is, and has been, perceived as an "island," between the neighborhoods north of Pico Boulevard and south of Venice Boulevard. This division results from the high volume of traffic on Venice and Pico Boulevards and the fact that developments on the site have been perceived as difficult to access and have not been conducive to through traffic from north to south for both pedestrian and automobile traffic. In addition, the topography of the area with the bluffs to the south of Venice Boulevard preclude neighborhood interaction.~~

Community Facilities and Services

Community facilities and services discussed in this section include police and fire protection, schools, libraries, medical facilities, churches, parks, cemeteries, and other community facilities near the project site. Table 7-32 and Figure 7-22 list and locate community facilities within the study area (i.e., area adjacent to the three alignments or within approximately one-half mile of the three station areas).

Law Enforcement

Law enforcement is provided by the City of Los Angeles Police Department (LAPD). The Wilshire Division Station is located at 4861 Venice Boulevard. The station serves communities located south of Beverly Boulevard, north of the Santa Monica Freeway (I-10), east of La Cienega Boulevard, and west of Normandie Avenue. The station is located within the study area.

Police substations in the Mid-City area include:

- Koreatown Substation 3330 W. 8th Street
- Washington Square Substation 4012 W. Washington Boulevard

Law enforcement responsibilities for any existing MTA facilities in the study area are provided by the MTA Transit Police. It is expected that the MTA Transit Police will merge into the City of Los Angeles Police Department and the County of Los Angeles Sheriff Department in the near future. After the merger the Red Line, as well as all other MTA operated transit lines, will be under the jurisdiction of these two departments.

Table 7-32
Community Facilities Located Within Study Area

Map No.[a]	Location of Facility	Approx. Distance to Olympic/ Arlington Station (feet)	Approx. Distance to Pico/San Vicente (feet)	Approx. Distance to Venice/San Vicente Station (feet)	Approx. Distance to Crenshaw/Olympic Station (feet)
City of Los Angeles Police Department					
1	Wilshire Division, 4861 Venice Blvd.	8,448	2,640	2,640	6,600
2	Koreatown Substation, 3330 W. 8th Street	2,880	8,880	8,880	4,560
3	Washington Square Substation, 4012 W. Washington Blvd.	6,000	3,840	3,840	6,240
City of Los Angeles Fire Department					
4	Fire Station #29, 4029 Wilshire Blvd.	3,274	7,656	7,762	3,274
5	Fire Station #68, 5023 Washington Blvd.	11,088	4,752	4,646	9,240
Los Angeles Unified School District					
6	Alta Loma Elem. School, 1745 Vineyard Ave.	8,184	2,112	2,006	6,600
7	Wilshire Crest Elem. School, 5241 West Olympic Blvd.	8,976	4,224	4,330	6,442
8	Los Angeles High School, 4650 West Olympic Blvd.	5,280	2,640	2,746	2,640
9	Queen Anne Pl. Elementary School, 1224 Queen Anne Pl.	4,752	1,320	1,426	2,640
10	Pio Pico Elem. and Middle School, 1512 South Arlington	3,300	5,280	5,280	3,432
11	Wilton Place Elem. School, 745 South Wilton Pl.	3,300	6,864	7,920	2,640
12	Arlington Heights Elem. School, 1717 7th Ave.	5,280	3,696	4,224	4,752
13	Mt. Vernon Junior High School, 4066 West 17th St.	5,280	3,168	4,224	4,752
Private Schools					
14	A+ Learning Center, 1157 Crenshaw Blvd.	3,168	2,904	3,010	1,742
15	Frances Hatch School, Inc., 1601 Highland Ave.	9,768	3,960	3,854	8,448

Table 7-32
Community Facilities Located Within Study Area

Map No.[a]	Location of Facility	Approx. Distance to Olympic/ Arlington Station (feet)	Approx. Distance to Pico/San Vicente (feet)	Approx. Distance to Venice/San Vicente Station (feet)	Approx. Distance to Crenshaw/Olympic Station (feet)
16	Pico Preschool, 4410 Pico Bl.	4,805	1,056	1,162	3,485
17	St. Gregory Nazianzen Elem. School, 911 Norton Ave.	2,006	4,805	4,910	475
18	Good Shepherd High School	2,429	5,808	5,808	3,485
City of Los Angeles Department of Recreation and Parks					
19	City of L.A. Eleanor Green Roberts Aquatic Center, 4526 Pico Blvd.	4,330	370	370	5,914
20	City of L.A. St. Charles Park, between Buckingham Rd. and Victoria Ave.	5,702	1,584	1,478	5,280
21	City of L.A. Harold A. Henry Park, 890 Lucerne Ave.	3,274	4,224	4,330	1,320
22	City of L.A. High School Memorial Park, 4625 Olympic Blvd.	5,755	3,274	3,379	3,168
23	City of L.A. Queen Anne Recreation Center, 1240 West Blvd.	5,280	1,056	1,162	3,326
24	Mascot Triangle Park, Mascot/Rimpau/Washington	8,870	3,062	2,957	7,392
City of Los Angeles Public Library					
25	Memorial Library, 4625 West Olympic Blvd.	5,280	3,168	3,274	2,746
26	Washington Irving Library, 1803 South Arlington Ave.	4,541	5,914	5,808	5,280
United States Postal Service					
27	U.S. Post Office, Washington Blvd./10th Ave.	6,336	3,696	3,590	6,125
28	U.S. Post Office, Washington Blvd./La Brea Ave.	10,982	4,752	4,858	9,240
Churches					
29	American Baptist Church of L.A., 4326 Pico Blvd.	5,808	370	475	3,960

Table 7-32
Community Facilities Located Within Study Area

Map No.[a]	Location of Facility	Approx. Distance to Olympic/ Arlington Station (feet)	Approx. Distance to Pico/San Vicente (feet)	Approx. Distance to Venice/San Vicente Station (feet)	Approx. Distance to Crenshaw/Olympic Station (feet)
30	Apostilica de Iglesia Christiana Universal, 4058 Pico Blvd.	3,960	2,218	2,323	2,640
31	Claretian Missionaries, 1119 Westchester Place	2,218	5,597	5,597	950
32	Hebrew Presbyterian Church, 4050 Pico Blvd.	3,960	2,218	2,323	2,640
33	Hungarian Reformed Church, 751 Crenshaw Blvd.	3,062	5,808	5,914	2,112
34	Hyo Soon Presbyterian Church, 1042 Crenshaw Bl.	2,482	3,274	3,379	300
35	Korean Samil Presbyterian Church, 1132 Crenshaw Bl.	3,115	2,534	2,640	1,690
36	L.A. Full Gospel Korean Church, 932 Crenshaw Blvd.	2,376	4,435	4,541	300
37	Missionary Benedictine Sisters, 933 Bronson Ave.	2,165	4,594	4,699	317
38	Reconciliation Apostilic Church, 4506 Pico Blvd.	6,283	211	317	4,277
39	St. James Episcopal Church, 3903 Wilshire Blvd.	3,115	8,554	8,659	4,330
40	St. Gregory Catholic Church, 911 Norton Ave.	2,006	4,594	4,596	500
41	The Way Presbyterian Church, 4402 Pico Blvd.	6,125	158	264	4,118
42	Wilshire United Methodist Church, 711 Plymouth Blvd.	3,749	5,914	6,019	2,165
43	True Hope Church, 1011 S. Arlington Ave.	Building would be acquired for station entrance	6,300	N/A	2,400
	Other Community Facilities				
44	A & I Residential Board & Care, 1681 Longwood Ave.	9,504	3,379	3,274	7,762
45	Country Club Guest Home, 1133 3rd Ave.	1,637	4,752	4,752	2,006
46	Crenshaw Children's Center, 675 Crenshaw Blvd.	3,274	6,600	6,706	2,218

Table 7-32
Community Facilities Located Within Study Area

Map No.[a]	Location of Facility	Approx. Distance to Olympic/ Arlington Station (feet)	Approx. Distance to Pico/San Vicente (feet)	Approx. Distance to Venice/San Vicente Station (feet)	Approx. Distance to Crenshaw/Olympic Station (feet)
47	Fairlight Home for Independent Living, 1271 3rd	2,218	4,488	4,488	2,640
48	Legal Aid Foundation of Los Angeles, 1102 Crenshaw Bl.	3,115	3,274	2,746	1,056
49	Queen Anne Place Children's Center, 1212 Queen Anne Pl.	4,752	1,373	1,479	3,062
50	Windsor Gardens Convalescent Home, 915 Crenshaw Blvd.	2,476	4,535	4,641	400
51	Los Angeles County MTA (Bus) Pico/Rimpau Transit Center	N/A	N/A	N/A	N/A

a. Map No. Refers to the numbers shown on Figure 7-22.

~~Fire Protection~~

~~Fire protection and prevention services within the area is provided by the City of Los Angeles Fire Department. Four fire stations serve the general area: Station 26 located at 2009 Western Avenue; Station 29 located at 4029 Wilshire Boulevard; Station 61 located at 5821 West Third Street; and Station 68 located at 5023 Washington Boulevard. Stations 29 and 68 would serve the proposed project stations and rail alignment.~~

~~Schools~~

~~Public schools located within the study area are operated by the Los Angeles Unified Schools District. A number of private schools are operated by other organizations. Please refer to Table 7-32 above for a full listing of schools within the study areas.~~

~~Parks~~

~~Parks and recreational facilities within the study area are operated by the City of Los Angeles Department of Recreation and Parks and include the following:~~

- ~~Harold A. Henry Park located at 890 Lucerne Avenue;~~
- ~~Los Angeles High School Memorial Park located at 4625 Olympic Boulevard;~~
- ~~Queen Anne Recreation Center located at 1240 West Boulevard;~~
- ~~St. Charles Park which runs in a linear pattern along St. Charles Place between Buckingham Road and Victoria Avenue; and~~

ULTRASYSTEMS
ENVIRONMENTAL
INCORPORATED

FIGURE 7-22
LOCATION OF COMMUNITY FACILITIES

- ~~Eleanor Green Roberts Aquatic Center at 4526 Pico Boulevard.~~

~~Libraries~~

~~There are two City of Los Angeles public libraries located within the study area. The Memorial Library is located at 4625 West Olympic Boulevard and the Washington Irving Library is located at 1803 South Arlington Avenue.~~

~~Post Offices~~

~~There are two U.S. Post Offices located within the study area at Washington Boulevard/ 10th Avenue and Washington Boulevard/La Brea Avenue, respectively.~~

~~Churches~~

~~There are 14 churches located within the study area. Please refer to Table 7-32 above for a full listing of churches within the study areas.~~

~~Other Facilities~~

~~Other facilities located in the study area include homes for the aged, children's centers, offices of the Legal Aid Foundation, and the Pico/Rimpau Transit Center, as listed on Table 7-32 above.~~

~~In addition to the specific community facilities listed on the table, commercial establishments such as supermarkets, medical offices, a health club, etc., also provide services to the community. Commercial uses are located along the major arterials throughout this community, i.e, Wilshire, Olympic, Crenshaw, and Pico Boulevards. These are described in more detail in Section 7-4, Land Use.~~

~~Hospitals~~

~~There are no regional hospitals located within the study area.~~

~~Cemeteries~~

~~There is one cemetery located within the study area; Rosedale Cemetery, 1831 W. Washington Boulevard, Los Angeles.~~

7.8.2 Project Impacts

Thresholds of Significance Criteria

This section examines the potential for the project to divide or detach existing communities/ neighborhoods. A significant impact would result if an alternative would:

- create barriers that would divide existing neighborhoods; or
- remove a community facility or otherwise prevent it from effectively providing it services to the community.

7.8.2.1 Construction Impacts

No Project Alternative

Existing communities and community facilities are expected to remain unaffected if the proposed project is not constructed.

Alternative A (Wilton/Arlington/Pico)

Construction activities for the Olympic/Arlington Station would cause environmental impacts that could disrupt or otherwise limit a nearby community facility from being able to effectively provide its services to the community. ~~Development of Alternative A could potentially impact several community facilities by effecting their ability to provide their services to the community. A Korean TV Station (Hanmi TV, KATV, Channel 52) is located on the northwest corner of Olympic Boulevard and Wilton Place/Arlington Avenue, 3511 West Olympic Boulevard. Immediately north of the TV Station is~~ A Buddhist Temple is located on Wilton Place immediately north of Olympic Boulevard and the Olympic/Arlington Station construction area. The twin tunnels ~~for Alternative A~~ would pass directly under this property. ~~The Olympic/Arlington Underground Station could also have an effect on this community facility and its ability to effectively provide their services to the community. Of~~ The primary concerns with this community facility are the potential impacts that noise and vibration could have on their Sunday worship ~~day-to-day activities, particularly the effects of vibration on sensitive recording equipment used at the television station~~. These potential impacts are discussed in greater detail in Section 7.11 (Noise and Vibration).

The Korean Youth Center, located at 680 South Wilton Place, and Wilton Place School, located at 745 South Wilton, are ~~would be~~ immediately adjacent to the street where the twin ~~the~~ tunnels would be located. ~~The tunnels for Alternative A would pass in close proximity to these two existing uses.~~ Tunnel boring activities and other related construction effects, such as settlement and ground-borne noise and vibration, could disrupt or otherwise limit these community facilities from being able to effectively ~~potentially have an affect on these existing uses to~~ provide their services to the community. These potential impacts are discussed in greater detail in Section 7.11 (Noise and Vibration) and 7.15 (Geology and Subsurface Conditions).

Construction activities to relocate a major storm drain under Queen Anne Place near the Queen Anne Elementary School and the Queen Anne Recreation Center would cause environmental impacts that could disrupt or otherwise limit these two community facilities from being able to effectively provide their services to the community. The effects would be the same as those described above for the Wilton Place School.

Alternative A would require that the ~~removal of the~~ Eleanor Green Roberts Aquatic Center be demolished to make room for the Pico/San Vicente ~~Underground~~ Station.

Alternative B (Wilton/Arlington/Venice)

Impacts resulting from the boring of the tunnel and the development of the Olympic/Arlington ~~Underground~~ Station would be the same as described above for Alternative A.

The development of a station on the Venice/San Vicente side of the site would retain the Eleanor Green Roberts Aquatic Center on the site, thereby not resulting in the acquisition and relocation impact that is associated with the implementation of Alternatives A and C. However, by retaining the Aquatic Center it would be exposed to construction effects that include: increased truck traffic, modified vehicular and pedestrian traffic patterns, increased noise and vibration, and dust.

The physical effects of the project, such as settlement and noise and vibration are mitigated in their appropriate sections of this document. After mitigation, the project would not result in significant impacts to the community or community facilities.

Alternative C (Crenshaw/Pico)

Construction activities for the Olympic/Crenshaw Station and the cut-and-cover construction activities within the Crenshaw Boulevard right-of-way between 8th Street and a point 1,100 feet south of Country Club Drive would cause environmental impacts that could disrupt or otherwise limit those community facilities located along this segment of Crenshaw Boulevard from being able to effectively provide their services to the community. The community facilities include several churches and one convalescent hospital. The effects would be the same as those described above in Alternative A.

~~No significant impacts to community facilities are anticipated with the tunnel and the development of the Olympic/Crenshaw Underground Station.~~

Construction activities to relocate a major storm drain under Queen Anne Place near the Queen Anne Elementary School and the Queen Anne Recreation Center would cause environmental impacts that could disrupt or otherwise limit these two community facilities from being able to effectively provide their services to the community. The effects would be the same as those described above for the Wilton Place School in Alternative A.

This alternative would require that ~~removal of~~ the Eleanor Green Roberts Aquatic Center be demolished ~~currently located on~~ to make room for the Pico/San Vicente Station. ~~However, the loss of this facility would be temporary since, as part of the project, MTA would be required to provide a new facility to serve the area.~~

After mitigation, the project would not result in significant impacts to the community or community facilities.

7.8.2.2 Operation and Maintenance Impacts

No Project Alternative

Existing communities and community facilities are expected to remain unaffected if the proposed project is not constructed.

Alternative A (Wilton/Arlington/Pico)

No significant impacts to community facilities are anticipated with the operation and maintenance of the Olympic/Arlington Underground Station, the Pico/San Vicente Underground Station, and the underground Metro Red Line Mid-City Segment. The development of the Pico/San Vicente Underground Station parking structure would not create a boundary or barrier within existing neighborhoods.

~~There could also be some impacts on~~ The existing ~~television station and~~ Buddhist Temple could potentially be impacted by~~, primarily associated with~~ noise and vibration. These issues are discussed in greater detail in Section 7.11 (Noise and Vibration).

There would be some positive impacts associated with the development of the Red Line because it would provide improved access for transit dependent persons to community/regional facilities. These potential impacts are discussed in greater detain in Section 7.5 (Demographics/Accessibility for Transit/Environmental Justice).

Alternative B (Wilton/Arlington/Venice)

No significant impacts to community facilities associated with the operation and maintenance of the Olympic/Arlington Underground Station, the Venice/San Vicente Station, and the underground Metro Red Line Mid-City Segment are anticipated.

The existing Buddhist Temple could potentially be impacted by noise and vibration. These are further discussed in Section 7.11 (Noise and Vibrations).

Approval of Alternative B would also result in positive impacts associated with increased access to community/ regional public facilities, particularly for transit dependent persons.

Alternative C (Crenshaw/Pico)

Alternative C would not add new structures that would create boundaries within existing neighborhoods. It would not remove existing community facilities that currently bring the community together. Therefore, it would not result in a significant impact on neighborhoods. In addition, stations may serve as a focal point for some level of increased community interaction.

No significant impacts to community facilities associated with the operation and maintenance of the Olympic/ Crenshaw Underground Station, the Pico/San Vicente Underground Station, and the underground Metro Red Line Mid-City Segment are anticipated.

Approval of Alternative C would also result in positive impacts associated with increased access to community/ regional public facilities, particularly for transit dependent persons.

7.8.3 Cumulative Impacts

7.8.3.1 Construction Impacts

The effects of other major projects planned for the area, such as subway or aerial extensions from the Pico/ or Venice/San Vicente Stations, and general growth are not expected to combine with project effects in such a way as to create cumulative impacts. Major new physical changes that could divide neighborhoods are not anticipated in the Crenshaw/Olympic area. Effects at the Pico/San Vicente site would not be significant for the Mid-City Segment alone and are not expected to be significant in combination with other lines that may connect at the site.

No Project Alternative

Implementation of the No Project Alternative would not result in any significant cumulative impacts to community facilities.

Alternative A (Wilton/Arlington/Pico)

Although the proposed project could result in impacts to community facilities during project construction, the buildout of related projects is not anticipated to create significant cumulative environmental impacts, above and beyond project-specific construction-related environmental impacts.

Alternative B (Wilton/Arlington/Venice)

Although the proposed project could result in impacts to community facilities during project construction, the buildout of related projects is not anticipated to create significant cumulative environmental impacts, above and beyond project-specific construction-related environmental impacts.

Alternative C (Crenshaw/Pico)

Although the proposed project would result in impacts to community facilities during project construction, the buildout of related projects is not anticipated to create significant cumulative environmental impacts, above and beyond project-specific construction-related environmental impacts.

7.8.3.2 Operation and Maintenance Impacts

No Project Alternative

Implementation of the No Project Alternative would not result in any significant cumulative impacts to community facilities.

Alternative A (Wilton/Arlington/Pico)

No significant cumulative impacts to community facilities associated with the operation and maintenance of the Olympic/Arlington Underground Station, the Pico/San Vicente Underground Station, and the underground Metro Red Line Mid-City Segment are anticipated. There would be some positive impacts associated with improved access to community/regional facilities, particularly for transit dependent persons.

Alternative B (Wilton/Arlington/Venice)

The effect would be the same as described above for Alternative A.

Alternative C (Crenshaw/Pico)

The effect would be the same as described above for Alternative A.

7.8.4 Mitigation Measures

Alternatives A and B

1. ~~During construction activities potential vibration and noise impacts to the TV station and Buddhist Temple would be minimized by grouting from the surface before tunneling and the use of floating slabs.~~ As is standard practice, noise analyses will be conducted by MTA for the specific land uses along the alignment during final design, and mitigation measures developed for construction and operation. These measures are provided in Section 7.11 (Noise and Vibration). ~~In addition, the MTA will relocate the TV station and/or limit the hours of construction as is necessary for the TV station to operate in a normal manner.~~

Alternatives A and C

2. In association with the City of Los Angeles Parks and Recreation Department, the MTA shall provide for the construction of a new pool facility to serve the area prior to the removal of the existing Eleanor Green Roberts Aquatic Center facility. (Also see Section 7.20 (Section 4(f) Evaluation.)

Alternatives A, B, and C

3. The physical effects of the project, such as settlement, noise and vibration, and dust are mitigated in the following respective sections of this document Sections 7.15, 7.11, and 7.12.

7.8.5 Unavoidable Significant Adverse Impacts

After mitigation, the project would not result in significant impacts to the community or community facilities.

7.9 SAFETY AND SECURITY

7.9.1 Environmental Setting

The purpose of this section is to describe existing and future safety and security services for passengers and for the surrounding community, and to identify and quantify any potentially significant safety and security impacts associated with the development of the project.

Police Services

Police services in the project area are provided by the City of Los Angeles Police Department (LAPD). The City police station serving the project area is the Wilshire Division, located at 4861 Venice Boulevard. The Wilshire Division has approximately 300 officers,[1] and responds to all reported cases involving violations of federal, state, and local codified laws. The LAPD also assists the City of Los Angeles Fire Department with traffic control in the event of a fire emergency. The most frequently committed crimes in the project area are vandalism and burglary. The area is well-patrolled due to its proximity to the Police Department's Wilshire Station, which is located in very close proximity to the proposed Pico/ or Venice/San Vicente Station site.

Police substations in the Mid-City area include:

- Koreatown Substation 3330 W. 8th Street
- Washington Square Substation 4012 W. Washington Boulevard

Currently, transit patrons are protected by MTA Transit Police. It is expected that the MTA Transit Police will merge into the City of Los Angeles Police Department and the County of Los Angeles Sheriff Department in the near future. After the merger the Red Line, as well as all other MTA operated transit lines, will be under the jurisdiction of these two departments, who will have resources trained for transit. The MTA will help fund police and sheriff personnel to protect transit patrons.

Fire Services

Fire service in the project area is provided by the City of Los Angeles Fire Department. The City fire station serving the project area is Station #29, located at 4029 Wilshire Boulevard (at South Van Ness Avenue). Station #29 employs 12 full-time employees. Fire Department personnel are trained in emergency medical techniques and can perform advanced life support services. Station equipment includes one fire/rescue truck and two engines.[2]

Emergency Medical Services

In addition to services provided by local police and fire departments, privately-owned medical facilities are available in neighboring ~~the~~ areas in the event of an emergency. Nearby medical facilities include Midway Hospital Medical Center, Westside Hospital, and Hospital of the Good Samaritan. All of these hospitals have emergency room capabilities. Emergency medical transportation in the Mid-City area is provided by the City Fire Department and by private ambulance companies.

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[1]Officer Honeyman, City of Los Angeles Police Department, Wilshire Division; telephone conversation, June 6, 1995.

[2]Captain Trejo, City of Los Angeles Fire Department, Station #29; telephone conversation, June 6, 1995.

Metro Rail Safety and Security Considerations

Safety and security considerations posed by Metro Rail transit facilities are addressed in the Southern California Rapid Transit District's (SCRTD's) *Final Report for Milestone 7: Safety, Fire/Life Safety, Security, and Systems Assurance*(SCRTD, March 1983). Safety, fire/life safety, and security programs and policies established for transit facilities in the *Milestone 7 Report* are summarized below.

Safety

Safety refers to the identification and prevention of accidents to passengers, employees, or others present near Metro Rail facilities; and damage to transportation system property. Such accidents and damage may be caused by events such as the following:

- Station accidents: falls on stairs or escalators; and personal illness;
- Boarding/disembarking accidents: falls or injuries at the vehicle doors, or during vehicle-to-platform transfers;
- Right-of-way accidents: falls from station platforms or unauthorized use of the train right-of-way;
- Collisions: system failure or malfunction or human operating error; and
- Fires and major structural failures: loss of electrical power, ventilation, or lighting.

The *Milestone 7 Report* identifies the overall safety objective for Metro Rail facilities as minimizing, controlling, and eliminating hazards. This objective is principally addressed at transit facilities through the application of appropriate architectural design, construction materials, lighting, access, and utility and communications systems.

Fire/Life Safety

Fire/life safety refers to emergency preparedness for all types of major events at transit facilities, including fires or other major disasters. Fire/life emergencies include:

- Vehicle fires: usually originating under the vehicle floor;
- Trainway electrical fires: usually caused by traction power short circuits;
- Station and facility fires: usually caused by electrical short circuits; trash fires; and vandalism;
- Smoke- and toxic fume-generating fires: resulting from any of the above sources and occurring anywhere in the system; and
- Subsurface gas incidences: through contamination of air and water.

Fire/life safety considerations involve preventive design criteria and emergency response procedures for the protection of people and property. Preventive design criteria typically involve the use of low- or non-combustible construction materials, fire sprinklers, alarm systems, and tunnel ventilation equipment. Emergency response procedures generally are implemented through employee training.

Security

Security refers to the prevention of acts resulting in harm to persons or damage to property, as well as freedom from threats or uncertainty about the likelihood of threatening acts. Security-related concerns at transit facilities include:

- Altercations; missing personal property; or lost children;
- Eating, drinking, smoking, or playing a radio onboard trains; fare disputes; and harassment of passengers;
- Non-aggravated or simple assault; fare evasion; vandalism; and possession of weapons; and

- Felonies such as aggravated assault; robbery; criminal sexual misconduct; arson; manslaughter; murder; burglary; and theft.

Security is typically addressed through deterrence (station design, lighting, visibility), detection (transit police, closed-circuit television monitoring, and emergency telephones), and apprehension (transit police and local law enforcement agencies). Proposition C, a one-half percent sales tax approved in 1990 by California voters, included a dedicated fund for transit security consisting of five percent of Proposition C sales tax revenues.

MTA maintains a transit police force which provides security at rail stations and on board trains. The California State legislature has granted MTA's Transit Police the power to make arrests, write tickets, and enforce laws as sworn peace officers. The MTA Transit Police is in the process of being merged into the LAPD and Los Angeles County Sheriff.

During 1994, there were about 5.3 million passenger boardings on the Metro Red Line.[3] There were a total of 126 arrests, 1,000 citations issued, and 36 reported crimes on the Red Line in 1994. These crimes were comprised of: six robberies; five assaults; one burglary; four larceny thefts; one bomb threat; one charge of indecent exposure; 15 charges of vandalism; and three miscellaneous charges.

Safety and Security Regulations, Plans, and Policies

The *Milestone 7 Report* establishes safety, fire/life safety, and security programs and policies for Metro Rail projects. These programs and policies are established to: adequately protect passengers, system personnel, and property from accidents, fire hazards, and criminal acts; and to address emergency preparedness.

MTA issued the *Metro Rail System Emergency Response Plan* in June 1995. The *Plan* contains emergency response procedures designed to assist MTA employees in responding to rail emergencies in a predictable and dependable manner. General procedures outlined in the *Plan* address: MTA emergency control; use of outside agencies; notification of emergencies; response to emergency scenes; and establishment of emergency scene boundaries. Specific procedures are provided for the following types of incidents: fire/smoke on train or in right-of-way/tunnel; train derailment/collision; injury or fatality; right-of-way intrusion; hazardous and toxic materials spill; earthquake; high velocity wind or flooding; bomb threat or explosion; and hostage or barricaded subject.

7.9.2 Project Impacts

Thresholds of Significance Criteria

Appendix G of the *State CEQA Guidelines* draws particular attention to those projects which could "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 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, fire, or emergency services;

[3] Extrapolated from data provided by Dorothy Gray, Manager, MTA Library; telephone conversation, July 3, 1995.

- Cause or create the potential for substantial adverse fire/life safety conditions, including: vehicle fires, trainway electrical fires, station and facility fires, and smoke- and toxic fume-generating fires.

- Cause or create the potential for substantial adverse security conditions, including: incidents, offenses, and crimes, or

- Substantially interfere with implementation of an emergency evacuation plan.

7.9.2.1 Construction Impacts

No Project Alternative

Under the No Project Alternative, no significant impacts would occur.

Alternative A (Wilton/Arlington/Pico)

Police Services

No significant impacts to police services are anticipated during project construction.

Fire Services

No significant impacts to fire services are anticipated during project construction.

Emergency Medical Services

No significant impacts to emergency medical services are anticipated during project construction.

Metro Rail Safety and Security Considerations

Safety

Project construction would present safety concerns at and near construction areas. Construction activities would pose the potential for accidents involving construction workers. Construction contractors would adhere to California Occupational Safety and Health Administration safety requirements, and would take standard industry precautions to ensure the safety of their workers and of other individuals on construction sites. Therefore, this potential effect of the project would be less than significant.

Occasionally, construction activities ~~detours along~~ within the public right-of-way ~~project alignment~~ would cause ~~usually route~~ traffic to be rerouted around construction barricades to other lanes or ~~rarely~~ onto adjacent streets thereby increasing the potential for accidents involving pedestrians (including students traveling to and from schools), bicycles, and vehicles. During construction project design features would include appropriate signage, flag persons, crossing guards, or other standard measures for detours so that the potential for such accidents would be less than significant.

Construction activities also could restrict police, fire, and emergency services access in the area. These restrictions would not be significant, however, because the project would establish community safety access routes in the project area over the duration of construction.

Fire/Life Safety

During project construction, fires and related events could occur in tunnels and during cut-and- cover operations. To reduce these concerns to a level of insignificance, the project would implement fire-preventive construction techniques. Stations would be constructed with non- or low-combustion materials to the maximum extent feasible. Low-combustion materials, such as those used for electrical wiring, would be low-smoke and non-toxic fume producing. In addition, appropriate fire safety provisions would be in place during construction. These provisions would include tunnel and station ventilation systems, designated evacuation routes, and adequate fire department access to station water connections and local fire hydrants. Fire extinguishers also would be maintained at all construction staging sites.

Emergency response procedures would be implemented for construction contractors, applicable MTA employees, and other local emergency response agencies. With implementation of the above-listed fire-preventive design criteria, the project's overall effect on fire and emergency services would be less than significant.[4]

Security

The project would be located in a highly populated, urbanized area. Tunneling equipment would have little potential for being vandalized, because it would not be visible aboveground and would be difficult to access. Cut-and-cover activities and construction staging sites would be highly visible, however, and could increase the potential for property crimes such as theft or vandalism of project construction vehicles, equipment, and materials.

To reduce these effects to a level of insignificance, construction contractors would fence construction sites and staging sites, and would arrange for locked security fences, thereby hindering criminal access to construction workers, vehicles, equipment, and materials. Overall, the effects of project construction on security at adjacent properties, and on local police services in the project area, would be less than significant.[5] Security guards would be used where necessary at the discretion of the MTA or MTA contractor.

Alternative B (Wilton/Arlington/Venice)

During project construction, all impacts to safety and security issues ~~police services, fire services,and emergency medical services~~ would be similar to Alternative A. ~~In addition, impacts to Metro Rail safety and security considerations would also be similar to Alternative A.~~

Alternative C (Crenshaw/Pico)

During project construction, all impacts to safety and security issues ~~police services, fire services,and emergency medical services~~ would be similar to Alternative A. ~~In addition, impacts to Metro Rail safety and security considerations would also be similar to Alternative A.~~

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[4]Captain Trejo, City of Los Angeles Fire Department, Station #29; telephone conversation, June 9, 1995.

[5]Detective Reiser, Los Angeles Police Department, Wilshire Division; telephone conversation, June 8, 1995.

7.9.2.2 Operation and Maintenance Impacts

No Project Alternative

Under the No Project Alternative, no significant impacts would occur.

Alternative A (Wilton/Arlington/Pico)

Police Services

During the operation and maintenance of the project no significant impacts to police services are anticipated.

Fire Services

During the operation and maintenance of the project no significant impacts to fire services are anticipated.

Emergency Medical Services

During the operation and maintenance of the project no significant impacts to emergency medical services are anticipated.

Metro Rail Safety and Security Considerations

Safety

The proposed station areas have ~~project has~~ the potential to result in conflicts between ~~Metro Rail-generated~~ bus, ~~and~~ automobile, ~~traffic and~~ pedestrian, and ~~street~~ traffic if not designed properly. To prevent safety impacts, stations will be designed to avoid conflicts between Metro Rail-generated bus and automobile traffic and pedestrian and street traffic. The project has been designed to prevent accidents, collisions, fires, structural failures, and related events at station entrances and within the stations, on the trains, and at ancillary facilities. Station entrances and interiors would include substantial lighting, explicit signage, slip-resistant walking surfaces, and fail-safe train controls. Pedestrian access to the station entrances would be indicated with street signs, and would be routed to ensure clear lines of sight to adjacent vehicular rights-of-way. The project also would provide standby electrical power, and emergency response and communications systems, including closed-circuit television monitors, a public address system, and emergency telephones.

Fire/Life Safety

During the operation of the Metro Red Line and its stations a potential exists for fire and other accidents/medical emergencies to occur on the trains or in the station areas. The project has been designed to prevent fires, exposure to hydrogen sulfide gas, and related events at the stations, on board trains, and at ancillary facilities. Stations would be constructed with non- or low-combustion materials to the maximum extent feasible. Low-combustion materials, such as those used for seat cushions or electrical wiring, would be low-smoke and non-toxic-fume- producing. In addition, appropriate fire safety provisions would be installed at both stations. These provisions would include fire sprinklers and stand pipes, smoke/gas detectors, alarm systems, tunnel and station ventilation systems, safety evacuation walkways, tunnel cross-passages, emergency exits, and adequate fire department access to station water connections and local fire hydrants.

Emergency fire response procedures would be implemented by station personnel, train operators, applicable MTA employees, and other local emergency response agencies. Emergency response training would be conducted at least once annually. With implementation of the above-listed fire-preventive design criteria, the project's overall effect on fire and emergency services would be less than significant.

Security

During the operation of the Metro Red Line and its stations a potential exists for security concerns that ~~associated with the project~~ include: incidents, offenses, crimes, and related events at station entrances and within the stations, on board trains, at ancillary facilities, and at adjacent properties. These security concerns would be reduced to a level of less than significant through the project design features described below. Procedures for responding to potential sabotage or terrorist acts (e.g., bomb threats, explosions, and suspicious packages) are described in MTA's Draft *Metro Rail System Emergency Response Plan*. Passenger evacuation and other response procedures have been established for Transit Police, train operators, Central Control Facility personnel, and on-scene coordinators. Facility and vehicle maintenance procedures also are described in the *Plan*.

Stations

During the operation of the Metro Red Line stations a potential exists for criminal activity and vandalism to occur within their areas of operation. To minimize criminal activity and vandalism at station entrances, station entrances and interiors would be open, well-lit, and employ clear site lines, high ceilings, and limited use of columns to minimize blind spots and potential hiding places for criminals. Stair passages would generally be straight and wide so that potential conflicts among stair users could be easily observed. To prevent deterioration of the station's visual appeal, vandal- and graffiti-resistant construction materials that facilitate quick repair and restoration of abused areas would be used.

Closed-circuit television cameras would be mounted at the station and station entrances to scan the train platform and each station entry point and other public areas. These cameras would provide visual surveillance of the station at the Central Control Facility. Emergency telephones would be located at stations so that transit patrons could report security-related events to the Central Control Facility. A public address system also would be provided so that the station supervisor can broadcast information to transit patrons. Rail tickets would be issued by automatic ticket machines, so the station supervisor would not handle money. With the above-described project design features fully operational and in place and an adequate level of MTA Police staffing provided, the project's effects on local police services at station facilities would be less than significant.[6]

Trains

During the operation of the Metro Red Line a potential exists for criminal activity and vandalism to occur on the trains. To minimize the potential for disturbance on board trains, intercoms would be provided on each train cab so that patrons could use them to report disturbances to the train operator. Communications systems between the trains and the Central Control Facility would permit the train operator to request transit security personnel to board the train or intercept any participants in a reported disturbance.

[6]Detective Reiser, Los Angeles Police Department, Wilshire Division; telephone conversation, June 8, 1995.

Transit police would conduct routine patrols on board the trains and station areas. Police and emergency response activities would be coordinated with the City of Los Angeles Police Department. Transit police would be professionally trained in the use of firearms in confined spaces, and in bodily defense techniques.

Ancillary Facilities

Proposed stations would locate ancillary facilities (including a traction power substation, ventilation systems, and other electrical equipment) underground, near one or both station entrances and at both ends of the station platforms. Ancillary facilities would not be accessible to the public, and thus would not be subject to criminal activity and vandalism.

For aboveground park-and-ride spaces, to minimize the potential for auto thefts, parking areas would be designed to maximize public visibility. Overall, the project's effects on local police services at ancillary facilities would be less than significant.[7]

Adjacent Properties

The project would create new public space through the addition of transit stations, parking lots and a bus transfer facility, and would increase pedestrian activity along properties near the stations. Security for these pedestrians would be maintained by existing law enforcement providers and by the informal surveillance inherent in well-frequented public spaces. Overall, the project's effects on security at adjacent properties and on local police services in the project area would be less than significant.[8] The increased public activity in the project area could also have a beneficial effect on community security. A portion of Proposition C funds would be used for station security.

Alternative B (Wilton/Arlington/Venice)

During project operation and maintenance, impacts to police services, fire services and emergency medical services would be less than significant. Operational measures that would be implemented to reduce safety and security impacts to a less than significant level would be the same as Alternative A.

Alternative C (Crenshaw/Pico)

During project operation and maintenance, impacts to police services, fire services and emergency medical services would be less than significant. Operational measures that would be implemented to reduce safety and security impacts to a less than significant level would be the same as Alternative A.

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[7]Detective Reiser, Los Angeles Police Department, Wilshire Division; telephone conversation, June 8, 1995.

[8]Detective Reiser, Los Angeles Police Department, Wilshire Division; telephone conversation, June 8, 1995.

7.9.3 Cumulative Impacts

7.9.3.1 Construction

No Project Alternative

Under the No Project Alternative, no significant impacts would occur.

Alternative A (Wilton/Arlington/Pico)

No significant impacts to police, fire or emergency medical services are anticipated. The construction of related projects during and/or following the construction of the Mid-City Segment could result in increased theft and vandalism of construction sites and/or materials. However, each construction site would have alarm systems and would enclose each construction site with perimeter fencing to deter theft and vandalism. No significant impacts are anticipated after the implementation of these measures.

Alternative B (Wilton/Arlington/Venice)

The effects would be the same as those described above for Alternative A.

Alternative C (Crenshaw/Pico)

The effects would be the same as those described above for Alternative A.

7.9.3.2 Operation and Maintenance

No Project Alternative

Under the No Project Alternative, no significant impacts would occur.

Alternative A (Wilton/Arlington/Pico)

Cumulative residential and commercial development identified for the community in the project area would incrementally increase the number of residents and workers near the project alignment. Project area population growth would increase by about 25 percent from 1990 to 2020. ~~This increase in density would not measurably alter the existing safety and security conditions in the community, nor add to the severity of impacts identified for the project alone. Similarly,~~ No known socioeconomic trends (e.g., employment, demographics) in the community would have any such effects. Thus, no cumulative impacts on safety and security are identified.

The operation and maintenance of the Mid-City Segment in combination with the buildout of related projects would likely result in increased service calls for police, fire and emergency services. For police service, the related projects would be required to hire private security or incorporate building designs (e.g., locked gates, electronically controlled doors) to deter theft, vandalism or other crimes.
Regarding fire service, development conditions imposed for each related project would require the installation of fire protection measures that could include sprinklers, hydrants, fire extinguishers, fire-resistant building materials and setbacks. No significant impacts are anticipated after the incorporation of these measures by other future projects. In addition, no significant impacts to emergency medical facilities, or impacts to Metro rail safety and security considerations are anticipated in conjunction with related project buildout.

Alternative B (Wilton/Arlington/Venice)

The effects would be the same as those described above for Alternative A.

Alternative C (Crenshaw/Pico)

The effects would be the same as those described above for Alternative A.

7.9.4 Mitigation Measures

During the operation and maintenance of the proposed project, the following measures will be implemented by the MTA to eliminate the potential for significant fire/life safety impacts:

1. Design criteria will focus primarily on the protection of people and property, include planning for adequate emergency exits, stand-by electrical power supplies, appropriate alarming systems and emergency communication systems. Station design will include closed circuit television monitors, a public address system, and emergency telephones in the communications system for use by patrons to contact central control.

2. Station design will utilize low combustion or non-combustion materials to the maximum extent possible. Where low combustion materials are used they will be low-smoke and low-toxic fume producing.

3. Stations will have fire sprinklers and "wet" stand pipes, smoke/gas detectors and alarm systems, adequate tunnel and station ventilation systems, and adequate exits and other emergency provisions such as safety walks and tunnel cross-passages.

4. MTA will implement emergency response procedures for operating personnel and local agencies. Extensive periodic training will also occur.

During the operation and maintenance of the proposed project, the following measures will be implemented by MTA to eliminate the potential for significant safety impacts at stations:

5. The stations will be designed to avoid conflicts between ~~Metro Rail-generated~~ bus, ~~and~~ automobile, ~~traffic and~~ pedestrian, and street traffic. Clear, comprehensible signs will be used and high levels of visibility would be maintained between pedestrians and vehicle drivers.

6. Station architectural design will include provisions such as those for adequate lighting, walking surfaces constructed of non-slip materials, safe pedestrian access to station entrances, and fail safe train control apparatus.

During the operation and maintenance of the proposed project, the following measure will be implemented by MTA to eliminate the potential for significant security impacts at stations:

7. The stations will be designed to enhance security. The station interiors will be open and clearly lit. Clear sight lines would be emphasized. Low ceilings, excessive numbers of columns, and darkened areas will be avoided. Designs will seek to eliminate any blind spots or potential hiding places for criminals. Passages leading to the street will receive specific attention. Stair passages will generally be kept straight and will be sufficiently wide so that their entire lengths can be readily seen, thus reducing unanticipated (and unobserved) conflicts with other users. Transit police will patrol the stations.

During the operation and maintenance of the proposed project, the following measure will be implemented by MTA to eliminate the potential for significant security impacts on trains:

8. Intercoms will be placed in each train car passenger compartment so that patrons can use them to report disturbances to the train operator. The train operator will then alert transit security people to board and/or otherwise intercept any suspects at the next station. Transit police will be assigned to routinely patrol the trains.

9. MTA will allocate security funds as appropriate to ensure adequate security and passenger protection.

7.9.5 Unavoidable Significant Adverse Impacts

No unavoidable significant adverse safety and security impacts are anticipated.

7.10 AESTHETICS

7.10.1 Environmental Setting

This section describes the aboveground elements of each alternative and assesses visual effects associated with introducing these elements into the existing environment. The analysis assesses the compatibility of the proposed visual changes with the existing environment in terms of height, scale, and character; the extent to which the aboveground elements would alter important existing views from surrounding uses or create new views of existing uses; the potential for shadow effects; and the potential for light and glare effects.

Height, Scale, and Character of the Existing Built Environment

For purposes of this discussion, the project area is described in terms of the major corridors along the project alignment (the Wilshire Boulevard, Crenshaw Boulevard, Wilton Place/Arlington Avenue, Pico Boulevard, and Venice Boulevard corridors).

Between Western Avenue and Crenshaw Boulevard, Wilshire Boulevard is lined primarily with low- to mid-rise office buildings, apartment buildings, retail mini-malls, restaurants, and a gas station. The buildings along Wilshire Boulevard are built to the sidewalk, except for the mini-malls which have parking lots fronting the street. Given the mix of building types, this portion of Wilshire Boulevard has a less than uniform urban streetscape.

The built environment along Crenshaw Boulevard between Wilshire and Pico Boulevards is comprised of a mix of structures varying in scale, use, and condition. These structures range from single-family homes (some with ground-floor retail) to apartment complexes and large commercial buildings. Setbacks for residential buildings are ~~the standard~~ 25 feet, while commercial buildings are built to the sidewalk. Most of the buildings along this portion of Crenshaw Boulevard are one to four stories in height.

Figure 7-23 provides an overview of the built environment along Crenshaw Boulevard and surrounding areas. The proposed Olympic/Crenshaw Station entrance sites (Alternative C) at the southwest and northeast corners of the intersection are currently occupied by a gas station and one- to three-story commercial buildings with billboards above, respectively. Crenshaw Boulevard occupies an approximately 70-foot-wide right-of-way, within which lies the 56-foot-wide roadway. The topography in this area slopes downward from Wilshire Boulevard to Olympic Boulevard, is generally flat between Olympic Boulevard and Country Club Drive, and then slopes up from Country Club Drive to Pico Boulevard.

Along the streets on either side of Crenshaw Boulevard, the streetscape characteristics substantially change to those associated with a more uniform low-density residential area. Single-family homes along Bronson Avenue (one block east of Crenshaw Boulevard) and Victoria Avenue (one block west of Crenshaw Boulevard) are generally consistent in height, scale, and setback. The homes at 860 to 932 Victoria Avenue (north of Olympic Boulevard) comprise a portion of a district that appears eligible for listing in the National Register of Historic Places and the homes at 1237 to 1269 Victoria Avenue (south of Olympic Boulevard) are included in the Oxford Square Craftsman District, which is eligible for listing on the National Register. See Section 7.16 for further discussion of these historic resources.

The Wilton Place/Arlington corridor, between Wilshire and Pico Boulevards, is characterized by a mixture of residential types ranging from low density single-family residential uses to commercial buildings up to five stories. Between Wilshire and Olympic Boulevards, Wilton Place is developed with a mixture of residential types, including single-family and multiple-family uses. Most of the buildings ~~units~~ are two-story. All four corners of the Olympic Boulevard/Wilton Place/Arlington Avenue intersection are developed with commercial buildings.

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FIGURE 7-23
OVERVIEW OF CRENSHAW BOULEVARD CORRIDOR

The northeast corner is occupied by a Unocal Gas Station, the northwest corner is occupied by four ~~numerous~~ commercial buildings ranging in size from one to four stories. The Korean television station KATV is located within the four-story building. Adjacent to the south side of the four-story building is a one-story building used as a Wedding Dress/Tuxedo/Flower store. This store has a small parking lot in front of it. Continuing in a southerly direction is a two-story commercial building housing a health clinic on the bottom floor and a tax service on the second floor. Immediately west of this building along Olympic Boulevard is a parking lot for the Olympic Mart Liquor Store. Figure 7-24 shows two of the commercial buildings on the northwest corner of Olympic Boulevard/Wilton Place/Arlington Avenue. The southwest corner of Olympic Boulevard/Wilton Place/Arlington Avenue is occupied by the Olympic Auto Mart, a used car dealership. There are also several large billboards on this corner. West of the car lot on Olympic Boulevard is a two-story medical building that has a large billboard on its roof. These existing uses are shown in Figure 7-25. Immediately south of the car lot on Arlington Avenue is the Kagopa Beauty Salon. On the southeast corner of Olympic Boulevard/Wilton Place/Arlington Avenue intersection is a business for herbs and acupuncture. Proceeding south on Arlington Avenue between Olympic and Pico Boulevards are single-family residential uses. On the southeast corner of Arlington Avenue and Country Club Drive is the historic Isaac Milbank Mansion.

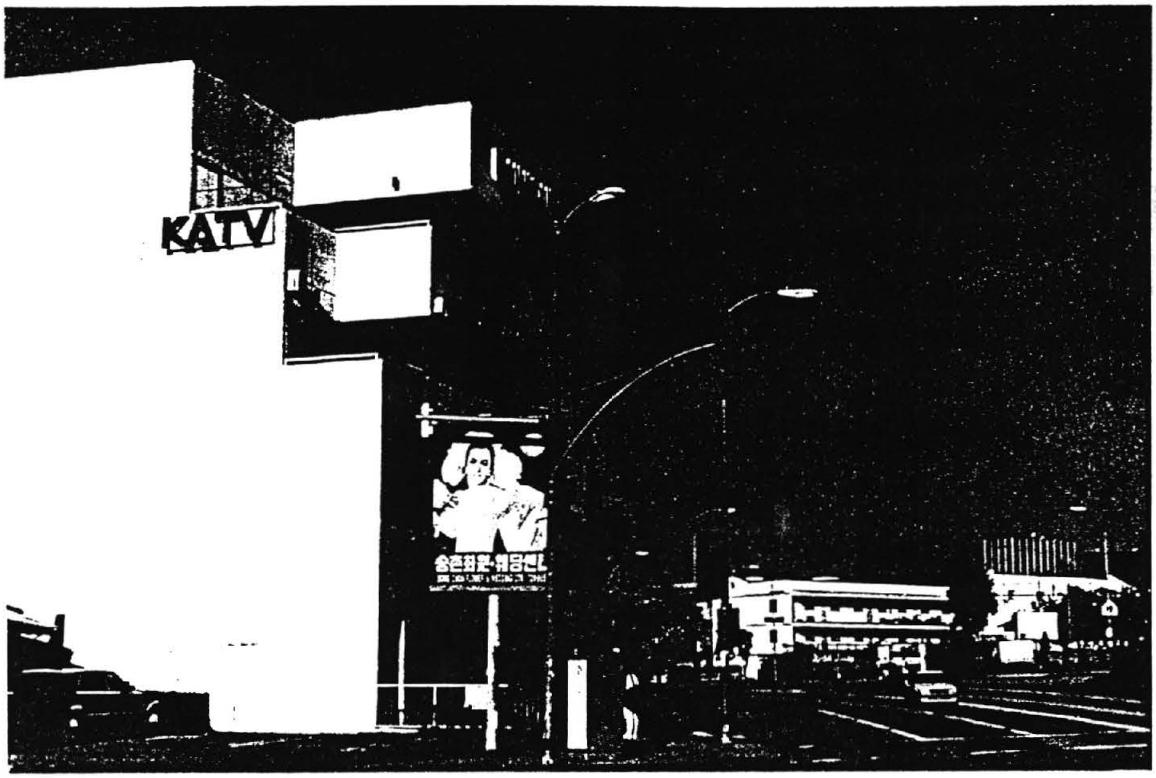
The Pico Boulevard corridor, between Arlington Avenue and San Vicente Boulevard, is characterized by low-rise commercial structures along both sides of this major thoroughfare. The north side of Pico Boulevard is developed primarily with retail structures which are in fair to poor condition. Set behind this commercial frontage are residential areas characterized by single- and multi-family residences.

Figure 7-26 provides an overview of the areas north of Pico Boulevard in the vicinity of the Pico/San Vicente Station site. The south side of Pico Boulevard is developed with retail and automotive uses which are housed in buildings that are in fair to poor condition. The visual environment south of the Pico Boulevard frontage is quite different from that of Pico Boulevard. This area, Victoria Park, appears to be eligible for listing on the National Register of Historic Places. It is mostly characterized by large two-story single-family homes set along a circular drive. These homes are set back approximately 25 feet from the street and are well-maintained.

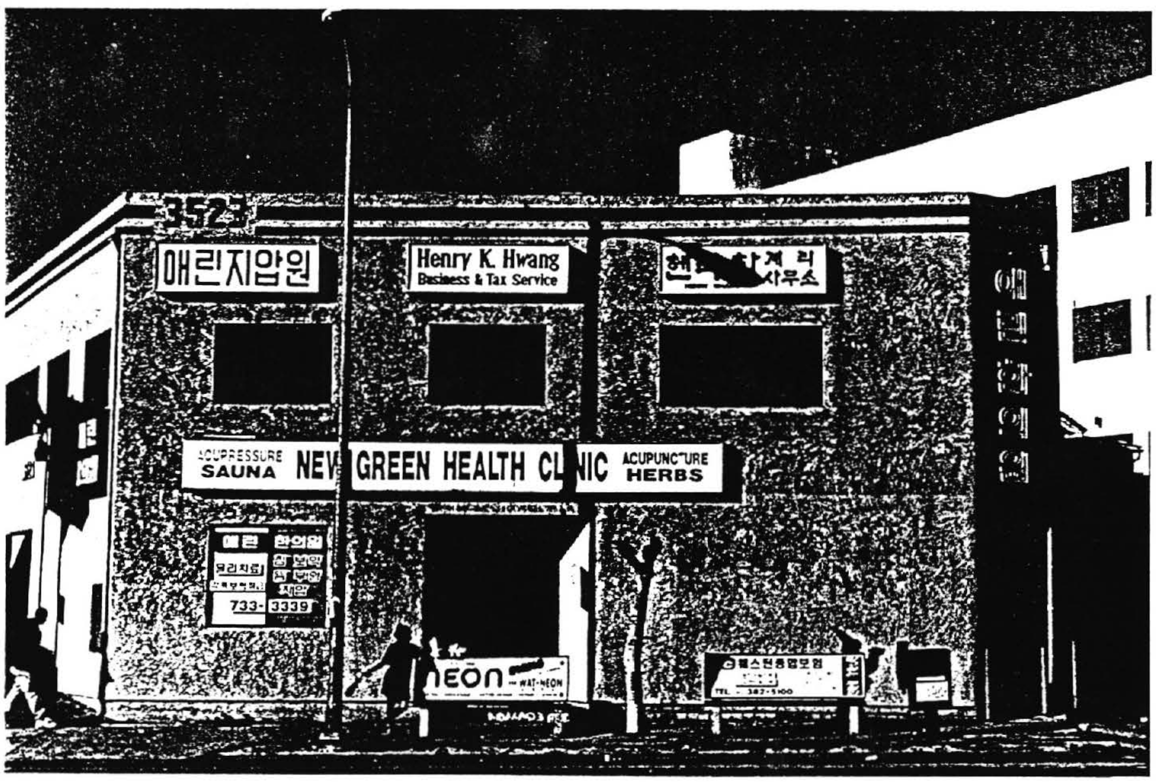
The Venice Boulevard corridor, between Arlington Avenue and Crenshaw Boulevard, is characterized by low-rise commercial structures intermixed with multi-family uses along both sides of this major thoroughfare. The south side of Venice Boulevard is developed primarily with retail structures between 7th Street and Arlington Avenue which are in fair to poor condition. Set behind this commercial and multi-family frontage to both the north and south are residential areas characterized by single- and multi-family residences. All four corners of Crenshaw and Venice Boulevards are developed with commercial uses.

Along both sides of the Venice Boulevard corridor between Crenshaw and West Boulevards are residential neighborhoods. Frontage along the north side of this portion of the corridor consists of sideyards and backyards belonging to the single- and multi-family residences that are within the Victoria Park neighborhood. Frontage along the south side consists of the sideyards of the single-family residences that are located within the Lafayette Square neighborhood.

Along both sides of the Venice Boulevard corridor between West and San Vicente Boulevards the topography begins to drop-off sharply to the north and rise to the south. The property north of Venice Boulevard in this area is the proposed site for the western terminus station. The property to the south of Venice Boulevard across from the site sits high above (approximately 30 feet near Vineyard Avenue/Venice Boulevard) the thoroughfare. Figure 7-27 displays the residences on the south side of Venice Boulevard.



Korean TV Station (Hanmi TV, KATV, Channel 52) located on
the northwest corner of Olympic Boulevard and
Wilton Place/Arlington Avenue, 3511 West Olympic Boulevard



Two-story commercial building located on
the northwest corner of Olympic Boulevard and
Wilton Place/Arlington Avenue, 3523 West Olympic Boulevard

FIGURE 7-24
NORTHWEST CORNER OF OLYMPIC BOULEVARD/WILTON PLACE/ARLINGTON AVENUE

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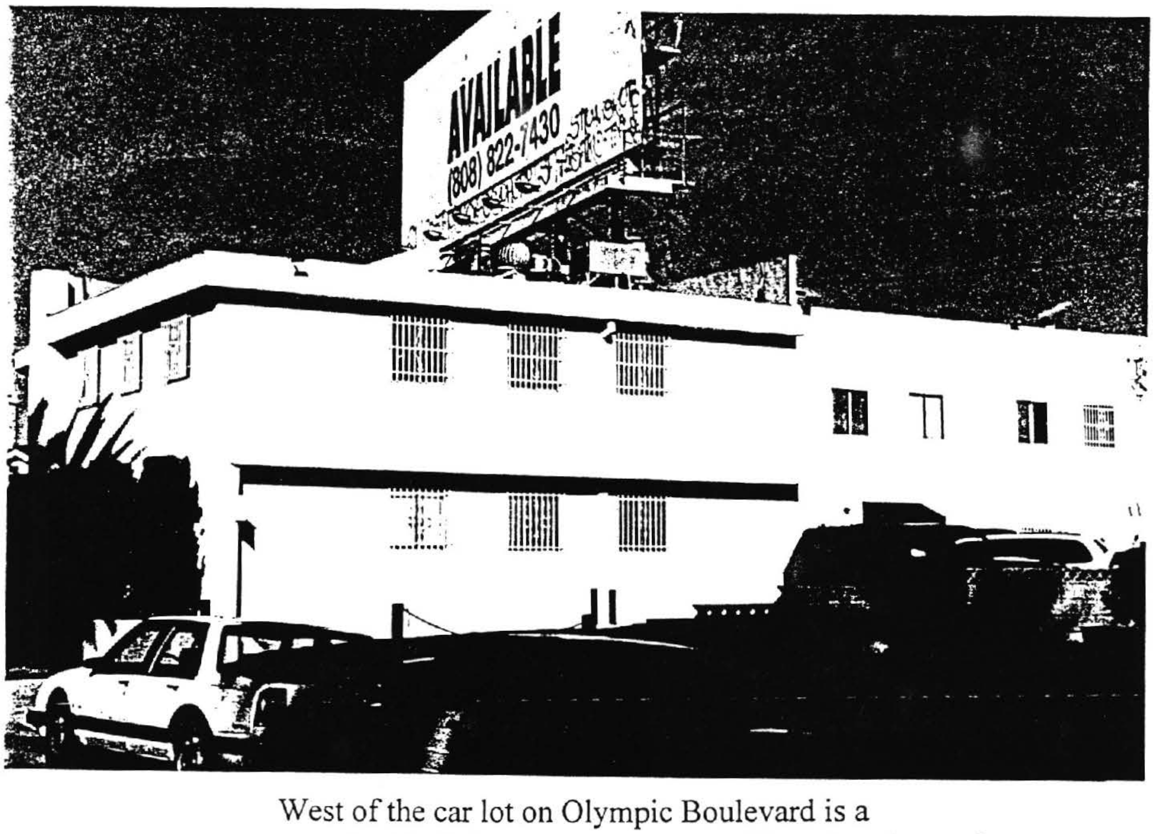
The Olympic Auto Mart, a used car dealership located on the Southwest Corner of Olympic Boulevard/Wilton Place/Arlington Avenue



West of the car lot on Olympic Boulevard is a two-story medical building that has a large billboard on its roof

FIGURE 7-25
SOUTHWEST CORNER OF OLYMPIC BOULEVARD/WILTON PLACE/ARLINGTON AVENUE

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Pico/San Vicente Site Boundary

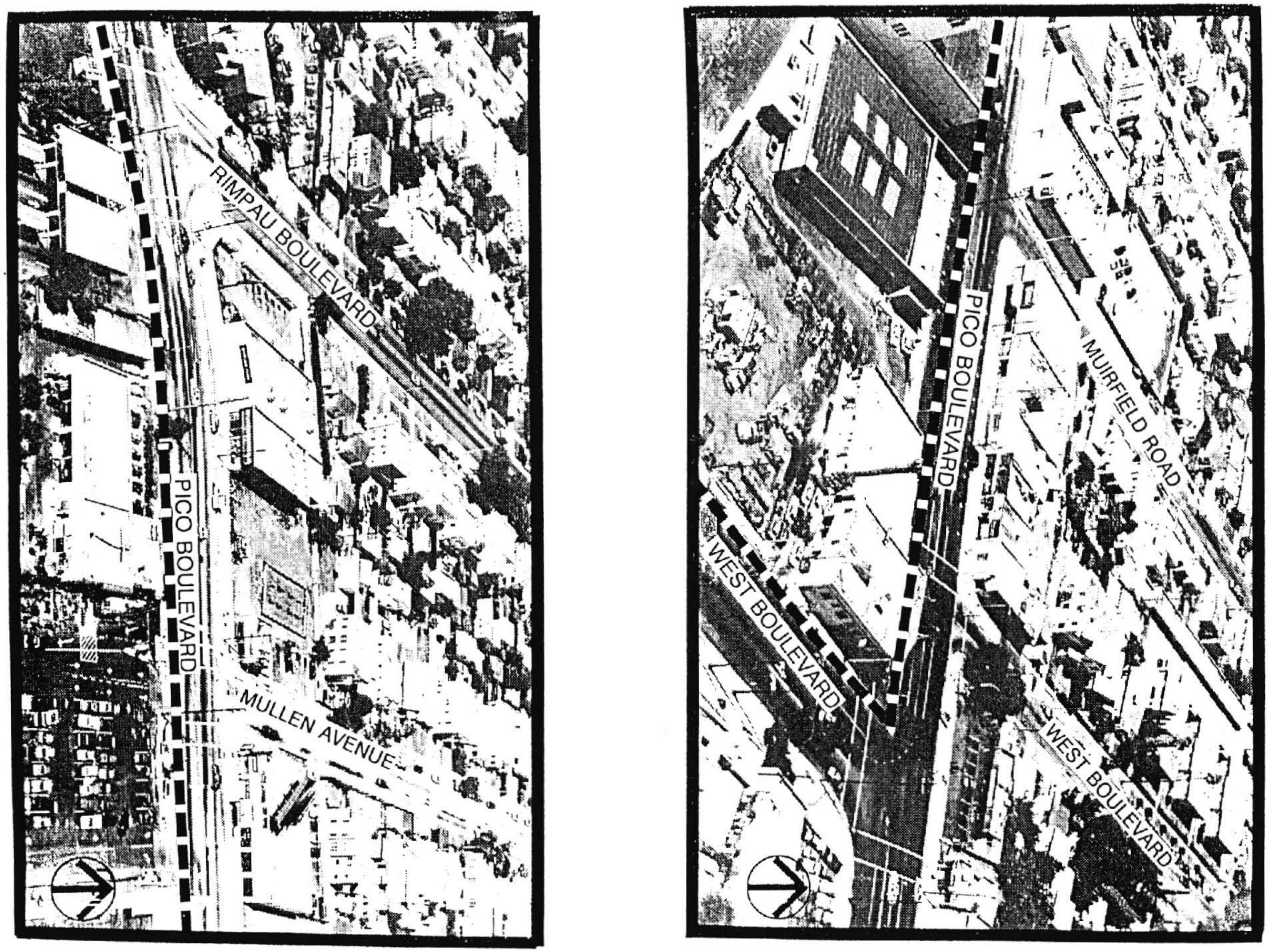

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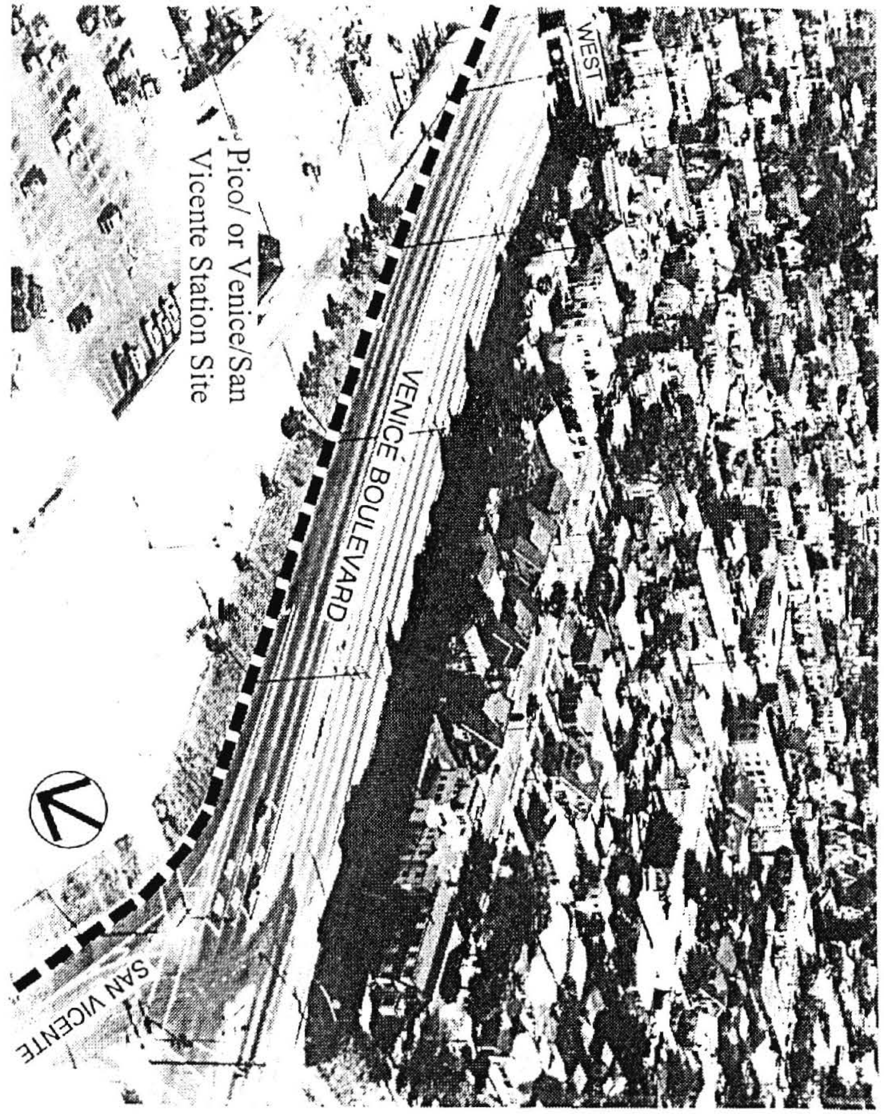
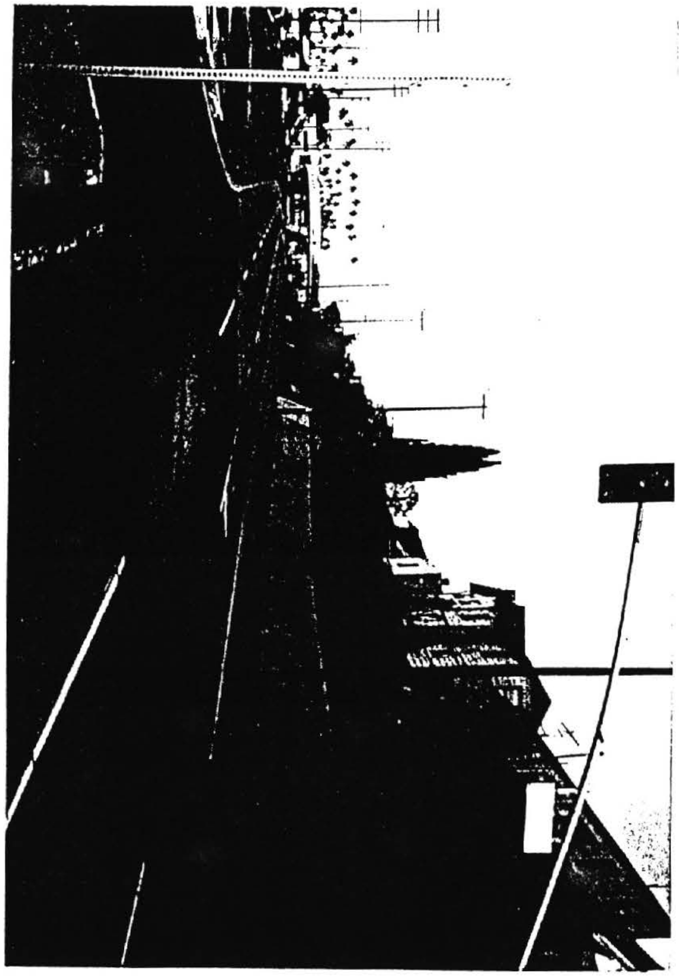
FIGURE 7-26
AREAS NORTH OF PICO BOULEVARD IN THE VICINITY OF THE PICO/SAN VICENTE STATION SITE



Aerial view of the residences south of Venice Boulevard across from the site



View of Venice Boulevard from Vineyard Avenue looking east at the West Boulevard bridge

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FIGURE 7-27
RESIDENCES ON THE SOUTH SIDE OF VENICE BOULEVARD ACROSS FROM THE SITE

The western terminus station site is located south of Pico Boulevard, north of Venice Boulevard, and between West and San Vicente Boulevards. The site is developed with a variety of structures oriented towards Pico, West, and San Vicente Boulevards, and set among large parking areas. Buildings appear scattered on the site, separated by parking lots, with no obvious central reference or consistent orientation. Existing structures on the site along or oriented towards Pico Boulevard include several small one-and two-story commercial buildings and an indoor public pool facility at the east end of the site, a large two-story commercial building between Muirfield Road and Mullen Avenue, and the Rimpau Bus Terminal. There is a large vacant commercial building at the western end of the site. Several two-story residential buildings border portions of West Boulevard. Steep grade increases (an escarpment of approximately 30 feet) occur in the south and east portions of the site, near Venice and West Boulevards. Additional steep grades occur beyond the site, south of Venice Boulevard.

West Boulevard crosses Venice Boulevard via a bridge. This bridge appears to be eligible for listing on the National Register of Historic Places.

<u>Existing Views</u>

This section identifies sensitive views and the groups that currently experience these views. Sensitive views are those that are designated 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. Views of historic resources are also generally sensitive, however, effects on historic resources, including visual effects, are discussed in Section 7.16. Viewer groups include motorists, pedestrians, residents, and occupants and visitors of commercial buildings.

Northerly views from the residences along Venice Boulevard immediately south of the western terminus station site include a panorama that includes a large area of the city and extends to the Santa Monica Mountains. Because these views are uniquely scenic for the area, they are considered sensitive for purposes of this analysis. These views are available primarily to the residents of homes along the south side of Venice Boulevard between West Boulevard and Vineyard Avenue. These homes front West 16th Place.

There are no scenic views along the affected portions of Wilshire and Crenshaw Boulevards.

Views along the major roadways that traverse the project area do not offer unique or especially scenic vistas. However, the portions of Wilshire, Venice, and San Vicente Boulevards in the area of the project or adjacent to the western terminus station site are part of "scenic highways" as designated by the Scenic Highways Plan; a part of the Circulation Element of the City of Los Angeles General Plan, and which designates scenic highways that merit special controls for protection and enhancement of scenic resources. A scenic highway is defined in the plan as "a public way which provides opportunities for the enjoyment of scenic resources and designated as such by the Plan for purposes of preserving and enhancing those resources through reasonable controls." The Scenic Highways Plan provides general objectives, policies, and programs for protecting these visual resources along scenic highways and calls for the development of Corridor Plans that would identify specific controls to be adopted for each scenic highway. The three designated scenic highways that include streets in the area of the proposed project are Wilshire Boulevard (along its entire length within the City of Los Angeles), San Vicente Boulevard from Venice Boulevard to Beverly Hills City limits, and Venice Boulevard from Westwood Boulevard to Crenshaw Boulevard. Corridor Plans have not yet been established for the segments of the scenic highways which are within the project area. (Corridor Plans have been prepared for San Vicente Boulevard west of the Veterans Administration hospital which is out of the study area.) The preparation of Corridor Plans is subject to Corridor Plan initiation by the Los Angeles City Council. The plan's policy regarding scenic highways for which a Corridor Plan has not yet been developed calls for the application of reasonable interim control measures on a case-by-case basis.

Due to the General Plan designation of Wilshire, Venice, and San Vicente Boulevards as scenic highways, the appearance of ~~views from~~ these roadways in the vicinity of the project are considered sensitive for purposes of this analysis. However, it should be noted that the portions of these streets that are within the immediate vicinity of the project do not exhibit scenic qualities similar to the remainder of the designated scenic highways. For example, San Vicente Boulevard is described in the Scenic Highways Plan as a wide street with a landscaped median through a multiple-residential area. This description does not apply to the portion of San Vicente Boulevard that forms the western boundary of the western terminus station site. In this area, there is no median nor multiple-residential area. The portion of Wilshire Boulevard between Western Avenue and Crenshaw Boulevard does not exhibit the same uniform urban streetscape for which Wilshire Boulevard is generally noted. A major contributing factor to the visual quality of Venice Boulevard is its wide landscaped median. However, in the project area this median is not landscaped.

Views along Wilshire, Venice, and San Vicente Boulevards are experienced primarily by motorists. Although these views are also available to pedestrians, pedestrian activity along these streets, particularly the affected portions of Venice and San Vicente Boulevards, is minimal.

Shade/Shadow

The Olympic/Arlington Station site (Alternatives A and B) is characterized by commercial and residential buildings up to four stories in height. The shadows from the buildings generally fall west and north of the buildings during the morning hours. During the afternoon hours the shadows fall onto Olympic Boulevard and Arlington Avenue. Existing shadows are not considered a significant problem in the area of this potential station.

The Olympic/Crenshaw Station site (Alternative C) between Olympic Boulevard and Country Club Drive is characterized by primarily low-rise buildings. The tallest buildings are a two-story health club facility at the southeast corner of Olympic and Crenshaw Boulevards and a two-story office building at the northeast corner of Country Club Drive and Crenshaw Boulevard. Shade and shadow is minimal given the low-rise character of the buildings.

The Pico/Venice/San Vicente station site (all Alternatives) contains one major shadow source: A two-story commercial building (Builders Discount) which has a smaller third and fourth floor structure, in addition to air conditioning units. This building is rectangular in shape and occupies the central area of the site. Shadows cast from this building do not present a solar access problem in the affected area.

Artificial Light Sources

Outdoor lighting in the project area consists primarily of street lamps and security lighting. Vehicle headlights on the street network also contribute to nighttime light.

The Olympic/Crenshaw Station site (Alternative C) has existing lighting associated with the commercial buildings and signs. The Olympic/Arlington Station site also has existing lighting associated with the commercial buildings and signs. These sources of light are typical and do not present a significant effect in either neighborhood.

At the Pico/Venice/San Vicente station site (all Alternatives), the parking area and roof of the Builders Discount building are lit by several light standards (security lighting) bearing shielded globes. Such lighting is bright and visible but confined to the areas immediately adjacent to the site. Vehicle headlights on the property also add to evening illumination in the immediate locale. There is minimal light spillage from the interior of the buildings, given that the buildings are without windows except along Pico Boulevard. Residential uses, which could be affected by nighttime lighting from the site and which are considered to be more sensitive to nighttime lighting than nonresidential uses, are located behind a row of commercial properties 100 feet north of the site on the north side of Pico Boulevard, 100 feet east of the site on the east side of West Boulevard, and 125 feet south of the site on the south side of Venice Boulevard.

Glare

Glare is the result of sunlight or artificial light being reflected from finished surfaces. There is currently minimal glare at the project site because the existing buildings have minimal reflective surfaces.

7.10.2 Project Impacts

Thresholds of Significance Criteria

Appendix G of the State CEQA Guidelines provides that, "A project will normally have a significant effect on the environment if it will:...(b) Have a substantial, demonstrable negative aesthetic effect." The following discussion interprets this guideline and sets forth specific criteria that were used in identifying significant impacts of the proposed project.

Visual Compatibility of Project Elements with the Existing Environment

The following criterion was used to identify significant visual compatibility impacts:

- *A significant adverse visual impact would occur as a result of substantial inconsistencies between project visual elements and the surrounding environment in terms of physical attributes such as height, scale, and character.*

The perception of a visual element as aesthetically positive or negative is subjective and as such may vary from person to person. However, the above criterion is based on the notion that in general, visual elements which are out-of-scale or are of substantially different character than surrounding elements are likely to viewed as adverse by a majority of people. Exceptions to this general rule can occur when the character or quality of existing visual elements is poor or there is a stated goal to substantially change the urban scale and form of a particular area.

Effects on Existing Views

The following criteria were used to identify significant impacts related to existing views:

- *A significant adverse visual impact would occur if the project obstructed or adversely changed the object of sensitive views. 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.*

- *A significant adverse visual impact would result if the project made available views that compromised the privacy of existing uses, primarily residences.*

Views of historic resources are also generally sensitive, however, effects on historic resources, including visual effects, are discussed in Section 7.16.

Shade/Shadow

The following criterion was used to identify significant impacts related to shade/shadow:

- *A significant adverse impact would result if project facilities were to cast a shadow on or over more than one-third of an adjacent residential use or solar sensitive use (i.e., swimming pool) for more than two hours between the hours of 9:00 a.m. and 3:00 p.m..*

Shade/shadows effects are examined for the following seasons of the year and time periods:

- Winter solstice, December 21—9:00 a.m., 12:00 p.m., and 3:00 p.m.
- Summer solstice, June 21—9:00 a.m., 12:00 p.m., and 3:00 p.m.

These two periods were selected because they represent the two extremes of shadow locations and lengths. Shadow lengths are longest on the winter solstice (December 21st) when the sun is at its southern most point. Shadow lengths are shortest on the summer solstice (June 21st) when the sun is at its northern most point.

In addition to seasonal variations, the extent and duration of shade moves with the sun throughout the day. Thus, depending on the time of day and season of year, shadows would substantially vary in their length. Shadows are generally cast in a westerly direction during the morning hours. Throughout the day as the earth moves in relationship to the sun, shadows move from the west to the east. Shadows are longest in the early morning and late afternoon; they are shortest at noon. In other words, shadow lengths shorten between the morning and noon hours and lengthen between noon and late afternoon.

Artificial Light

The following criterion was used to identify significant impacts related to artificial light:

- *A significant adverse impact would result if project facilities created major new sources of light that intrude on neighboring residential areas.*

Glare

The following criterion was used to identify significant impacts related to glare:

- *A significant adverse impact would result if project facilities created excessive glare that poses major hazards or annoyances to residents, motorists, or pedestrians.*

7.10.2.1 Construction

No Project Alternative

Under the No Project Alternative the existing visual/aesthetic conditions would continue. No new major visual elements would be constructed in the proposed project area, and existing structures would not be demolished. The visual/aesthetic setting would remain similar to its current condition and impacts related to visual compatibility, effects on existing views, shadows, light, and glare would not occur.

Alternative A (Wilton/Arlington/Pico)

Olympic/Arlington Station Site

Visual Compatibility with the Existing Environment

The Olympic/Arlington Station site would be located on the southwest corner of Olympic Boulevard and Arlington Avenue, and within an area of Arlington Avenue south of Olympic Boulevard. Figure 2-3 shows the conceptual site plan for the Olympic/Arlington Station.

Construction of the station and entrance area would require that four ~~the~~ existing buildings and ancillary structures (such as billboards) located ~~on the~~ south~~west corner~~ of Olympic Boulevard ~~and~~ between Arlington Avenue and Westchester Place be razed. See Section 7.6 (Property Acquisition and Displacement) for a complete description of the number of properties affected. The existing used car lot, the two billboards, the two-story medical building with the large billboard on its roof, its parking lot, the beauty salons building, and one ~~several~~ single-family residence south of these uses on Arlington Avenue would be removed. During construction, the station entrance area would be secured with appropriate perimeter fencing. Aesthetic shielding would be installed along the perimeter to conceal the construction activities. ~~During~~ The construction staging ~~the station entrance~~ area of the Olympic/Arlington Station site would not be visually compatible with the surrounding environment. This impact is not considered significant due to the temporary ~~and relatively short-term~~ nature of the construction activities.

The subway station would be constructed within the Arlington Avenue right-of-way by a cut-and-cover method. A trench would be excavated from the surface and the station would be constructed within the trench. As soon as the trench excavation reaches sufficient depth a temporary decking system would be installed over the trench to allow traffic to continue to flow along Arlington Avenue while station construction continues underneath. The temporary decking would act to visually shield the construction of the subway station. The entrance to the station site is located on an adjacent parcel (privately owned) to the west. The temporary decking would be visually different from a normal asphalt street, but this difference is not considered a visual incompatibility.

Effects on Existing Views

There are no objects of sensitive views currently located on or near the southwest corner Olympic Boulevard and Arlington Avenue. The removal of the billboards, the two commercial buildings, the paved car lot, and the parking lot is not considered to effect existing views. The removal of the two large billboards is a positive visual enhancement for the residential areas south of the site. The removal of the single-family homes would not effect any existing sensitive views. While the homes are well kept, their design and style is not unique to the area.

Shadow Effects

The removal of the existing structures on the site will reduce the shadows cast in the area. The construction activities will not cast any significant shadows off the site.

Artificial Light Effects

Security Lighting

The lighting associated with the existing structures on-site, including: billboard lighting, car lot lighting, signs, and structures would be removed by the razing of all structures on the southwest corner of Olympic Boulevard and Arlington Avenue. Construction security lighting would be installed on the surface as well as within the underground working areas. Lighting associated with construction activities would not be as visible to the surrounding community as the existing lighting is. The effects of construction lighting on the surrounding community is not considered significant. Construction of the station under the street would be artificially lit throughout the construction phase. This lighting would be shielded from the surface, and would not result in significant lighting effects on the surrounding community.

Vehicle Headlights

Light cast by existing vehicle headlights entering the existing uses on the southwest corner Olympic Boulevard and Arlington Avenue would be terminated by the commencement of construction. Light cast by construction truck headlights would be limited since the number of construction trucks on-site would be minimal. Construction workers would park their personal vehicles in an off-site ~~the~~ parking lot ~~on the southwest corner of Wilshire and Crenshaw Boulevards~~ which eliminates their potential light impact.

Glare Effects

Glare would not be a problem on the construction site since there would be no reflective surfaces being constructed at the surface.

Pico/San Vicente Underground Station Site

Visual Compatibility with the Existing Environment

Construction of the Pico/San Vicente Underground Station would require the removal of all structures between Pico, San Vicente, Venice, and West Boulevards, including the acquisition and relocation of the Eleanor Green Roberts Aquatic Center. The entire site would be graded and prepared for use as the construction staging area for the proposed project. Staging areas would be required for slurry treatment, soil stock-piling and removal, truck staging area, truck cleaning area, material storage area, and construction management trailers. The staging areas would be located along the southern and western portions of the site since the construction areas would be located along the northern and northeastern portions of the site. During construction, the Pico/San Vicente Underground Station site would be secured with appropriate perimeter fencing. Aesthetic shielding would be installed along the perimeter to conceal the construction activities. During construction, the Pico/San Vicente Underground Station site would not be visually compatible with the surrounding environment. Since the residences located along the southern side of Venice Boulevard would be approximately 30 to 50 feet higher in elevation than the surface working area of the construction staging area, they would have a direct view of the construction activities throughout the construction period. This impact is not considered significant because the existing physical attributes of the site do not offer any views that would be considered aesthetically pleasing. In fact, ~~many~~ some of the existing buildings on the site are considered to be in need of exterior repair and most of the site is a parking lot.

Effects on Existing Views

The following views are considered sensitive for purposes of this analysis:

- The portions of Venice and San Vicente Boulevards adjacent to the Pico/San Vicente station site are part of "scenic highways" as designated by the Scenic Highways Plan and therefore are considered sensitive for purposes of this analysis.

- Views from residences along the south side of Venice Boulevard looking north over the Pico/San Vicente Station site are sensitive because they include a scenic and relatively unique panorama of a large area of the city extending to the Santa Monica Mountains.

The proposed project would not affect the existing medians on Venice and San Vicente Boulevards or the potential for future landscaping of these medians, and thus would not conflict with the Scenic Highways Plan. Existing views from Venice and San Vicente Boulevards along and near the Pico/San Vicente Station site would be changed by the removal of existing structures on the site and their replacement with a construction staging area for the proposed project. Since the construction staging area would be aesthetically shielded around the perimeter of the site, views from local roadways would not be significantly effected. Occupants of vehicles passing the site would be exposed to the aesthetic shielding rather than the existing buildings and parking lots. To many, this visual change would probably be a positive one due to the deteriorated state of some of the existing buildings and parking lots.

The changes on the site for construction purposes would not adversely affect the quality of the distant views from those residences located south of the site. Therefore, significant adverse impacts on these views would not occur.

With regards to privacy issues, the closest residential uses are located north of the site behind commercial uses along Pico Boulevard, south of the site along Venice Boulevard, and east of the site along Victoria Park Drive. The elimination of existing structures on the Pico/San Vicente Station site and their replacement with a construction staging area for the proposed project would not make available views that would compromise the privacy of nearby residential uses because views of these residences are buffered from the site either by existing structures, grade changes, and/or their distance from the site.

<u>Shadow Effects</u>

The removal of the existing structures from the site and their replacement with a construction staging area for the proposed project would not result in any significant shadow effects.

<u>Artificial Light Effects</u>

<u>Security, Building, and Pedestrian Lighting</u>

Construction on the site would commence with the removal of the existing structures on the site. This construction activity would also remove all of the existing sources of artificial light on the site. Construction activities would require the installation of security lighting around the perimeter of the site, and throughout the interior of the site. Work areas on the surface of the site would also require the installation of lighting. In addition, construction trailers would have exterior lighting and interior lighting. Overall, it is expected that the construction security lighting would not be substantially different from the parking lot and security lighting currently found on the site. However, the lighting of construction work areas would be substantially brighter than the existing lighting.

The nearest residences are those located approximately 175 feet to the east of West Boulevard, approximately 120 feet south of the site on Venice Boulevard, and approximately 325 feet north of the site behind one-story commercial uses on Pico Boulevard. Since the construction work areas would be located in the southern and western portions of the site, they would be closest to the residences located south of Venice Boulevard. The greatest potential for light impacts to residences would be the lighting of construction work areas. These lighting facilities would be shielded and designed to eliminate light intrusion into surrounding areas. With these design measures, significant lighting impacts to land uses in the immediate vicinity of this site would not occur.

Vehicle Headlights

Light cast by construction truck headlights moving about the site would be the most prominent during the winter months when there is less daylight. Since construction truck headlights are directed at a low angle and perimeter screening would be used during construction, this would not result in a significant impact to surrounding residences. Overall additional light sources from construction vehicle headlights would be less intense than light generated from the existing parking lot use.

Glare Effects

None of the structures or other surfaces associated with construction activities have large reflective surfaces. As such, no glare effects are expected during the construction period.

Cut-and-Cover in Pico Boulevard

Visual Compatibility with the Existing Environment

During construction of Alternative A, Pico Boulevard between Victoria Avenue and the Pico/San Vicente Station site would be altered by cut-and-cover construction techniques required to relocate the storm drain and to build the concrete boxes that would connect the bored tunnels with the station. During the initial stages of excavation of the street there would be a visual incompatibility with the existing environment. Once the concrete decking is installed and traffic returns to a normal, this visual incompatibility would no longer exist.

During the construction period when the concrete decking is removed and the street is returned to normal, there would also be a short period of visual incompatibility with the existing environment. This visual effect is short-term and is not considered significant.

Effects on Existing Views

Pico Boulevard between Victoria Avenue and the Pico/San Vicente Station site is not a designated scenic highway, and it is not part of the "unique view" afforded the residences south of the site. Therefore, cut-and-cover construction within this segment of Pico Boulevard would have no effect on existing views.

Shade/Shadow

Cut-and-cover construction activities occur mainly at or below the surface of the ground. Therefore, cut-and-cover construction activities within Pico Boulevard would have no effect on shade or shadows.

Artificial Light

Cut-and-cover construction within Pico Boulevard would not cause artificial light effects on the surrounding residential neighborhoods. During surface construction all activities would occur during daylight hours. During underground construction within the cut-and-cover segment of the alignment artificial lighting would be shielded by the concrete decking installed over the construction area.

Glare

None of the structures or other surfaces associated with construction activities have large reflective surfaces. As such, no glare effects are expected during the construction period.

Alternative B (Wilton/Arlington/Venice)

Olympic/Arlington Station Site

Aesthetic/visual impacts created by the construction of the Olympic/Arlington Underground Station would be the same as those described above for Alternative A.

Venice/San Vicente Station Site[1]

Visual Compatibility with the Existing Environment

Construction of the Venice/San Vicente Station would require the removal of all structures between Pico, San Vicente, Venice, and West Boulevards, except for the Eleanor Green Roberts Aquatic Center which would be retained as is on the site. The remainder of the site would be graded and prepared for use as the construction staging area for the proposed project. Staging areas would be required for slurry treatment, soil stock-piling and removal, truck staging area, truck cleaning area, material storage area, and construction management trailers. The staging areas would be located along the northern portion of the site since the construction areas would be located along the southern and southeastern portions of the site. During construction, the Venice/San Vicente Station site would be secured with appropriate perimeter fencing. Aesthetic shielding would be installed along the perimeter to conceal the construction activities. During construction, the Venice/San Vicente Station site would not be visually compatible with the surrounding environment. Since the residences located along the southern side of Venice Boulevard would be approximately 30 to 50 feet higher in elevation than the surface working area of the construction staging area, they would have a direct view of the construction activities throughout the construction period. This impact is not considered significant because the existing physical attributes of the site do not offer any views that would be considered aesthetically pleasing. In fact, some ~~many~~ of the existing buildings and parking lots on the site are considered to be in need of exterior maintenance and repair.

Effects on Existing Views

The following views are considered sensitive for purposes of this analysis:

- The portions of Venice and San Vicente Boulevards adjacent to the Venice/San Vicente Station site are part of "scenic highways" as designated by the Scenic Highways Plan and therefore are considered sensitive for purposes of this analysis.
- Views from residences along the south side of Venice Boulevard looking north over the Venice/San Vicente Station site are sensitive because they include a scenic and relatively unique panorama of a large area of the city extending to the Santa Monica Mountains.

The proposed project would not affect the existing medians on Venice and San Vicente Boulevards or the potential for future landscaping of these medians, and thus would not conflict with the Scenic Highways Plan. Existing views from Venice and San Vicente Boulevards along and near the Venice/San Vicente Station site would be changed by the removal of existing structures on the site and their replacement with a construction staging area for the proposed project. Since the construction staging area would be aesthetically shielded around the perimeter of

[1]/ The aesthetic/visual impacts associated with construction are the same for the Venice/San Vicente Open Air (Lower Elevation) Station (Alternative B1) or the Venice/San Vicente (Higher Elevation) Station (Alternative B2) site, except as specifically stated.

the site, views from local roadways would not be significantly affected. Occupants of vehicles passing the site would be exposed to the aesthetic shielding rather than the existing buildings. T~~o many, t~~his visual change ~~would probably~~ may be a positive one due to the deteriorated state of some of the existing buildings and parking lots.

The changes on the site for construction purposes would not adversely affect the quality of the distant views from those residences located south of the site. Therefore, significant adverse impacts on these views would not occur.

With regards to privacy issues, the closest residential uses are located north of the site behind commercial uses along Pico Boulevard, south of the site along Venice Boulevard, and east of the site along Victoria Park Drive. The elimination of existing structures on the Venice/San Vicente Station site and their replacement with a construction staging area for the proposed project would not make available views that compromise the privacy of nearby residential uses because views of these residences are buffered from the site either by existing structures, grade changes, and/or distance.

Shadow Effects

The removal of the existing structures from the site and their replacement with a construction staging area for the proposed project would not result in any significant shadow effects.

Artificial Light Effects

Security, Building, and Pedestrian Lighting

Construction on the site would commence with the removal of the existing structures on the site. This construction activity would also remove all of the existing sources of artificial light on the site. Construction activities would require the installation of security lighting around the perimeter of the site, and throughout the interior of the site. Work areas on the surface of the site would also require the installation of lighting. In addition, construction trailers would have exterior lighting and interior lighting. Overall, it is expected that the construction security lighting would not be substantially different from the parking lot and building security lighting currently found on the site. However, the lighting of construction work areas would be substantially brighter than the existing lighting.

The nearest residences are those located approximately 175 feet to the east of West Boulevard, approximately 120 feet south of the site on Venice Boulevard, and approximately 325 feet north of the site behind one-story commercial uses on Pico Boulevard. Since the construction work areas would be located in the northern portion of the site, they would be closest to the residences located north of Pico Boulevard. However, these residences are shielded from the site by a row of commercial buildings located along the northern street frontage of Pico Boulevard. The greatest potential for light impacts would be to the residents residing south of Venice Boulevard immediately across from the site. Due to the higher elevation, they would have a direct view of the construction work areas and their associated lighting. These lighting facilities would be shielded and designed to eliminate light intrusion into surrounding areas. With these design measures, significant lighting impacts to land uses in the immediate vicinity of this site would not occur.

Vehicle Headlights

Light cast by construction truck headlights moving about the site would be the most prominent during the winter months when there is less daylight. Since construction truck headlights are directed a low angle and perimeter screening would be used during construction, this would not result in a significant impact to surrounding residences. Overall additional light sources from construction vehicle headlights would be less intense than light generated from the existing parking lot use.

Glare Effects

None of the structures or other surfaces associated with construction activities have large reflective surfaces. As such, no glare effects are expected during the construction period.

Cut-and-Cover in Venice Boulevard

Visual Compatibility with the Existing Environment

During construction of Alternative B, Venice Boulevard between Victoria Avenue and the Venice/San Vicente Station site would be altered by cut-and-cover construction techniques required to build a new storm drain in the south half of the street, and later to build the boxes that would connect the bored tunnels with the station. During the initial stages of excavation of the street there would be a visual incompatibility with the existing environment. Once the concrete decking is installed and traffic returns to a normal, this visual incompatibility would no longer exist.

During the construction period when the concrete decking is removed and the street is returned to normal, there would also be a short period of visual incompatibility with the existing environment. This visual effect is short-term and is not considered significant.

Effects on Existing Views

Venice Boulevard between Victoria Avenue and the Venice/San Vicente Station is designated as a scenic highway, however, the visual quality Venice Boulevard is noted for, its wide landscaped median, is not present in this segment of the boulevard. Therefore, cut-and-cover construction within Venice Boulevard would have no effect on existing views.

Shade/Shadow

Cut-and-cover construction activities occur mainly at or below the surface of the ground. Therefore, cut-and-cover construction activities within Venice Boulevard would have no effect on shade or shadows.

Artificial Light

Cut-and-cover construction within Venice Boulevard would not cause artificial light effects on the surrounding residential neighborhoods. During surface construction all activities would occur during daylight hours. During underground construction within the cut-and-cover segment of the alignment artificial lighting would be shielded by the concrete decking installed over the construction area.

Glare

None of the structures or other surfaces associated with construction activities have large reflective surfaces. As such, no glare effects are expected during the construction period.

Alternative C (Crenshaw/Pico)

Olympic/Crenshaw Underground Station

Visual Compatibility with the Existing Environment

The Olympic/Crenshaw Station site includes properties on the southwest and northeast corners of Olympic and Crenshaw Boulevards, and an area within Crenshaw Boulevard south of Olympic Boulevard. Figure 2-9 shows the conceptual site plan for the Olympic/Crenshaw Station.

Construction of the two station entrance areas would require the existing buildings and structures located on the southwest and northeast corners of Olympic and Crenshaw Boulevards be razed. See Section 7.6 (Property Acquisition and Displacement) for a complete description of the number of properties affected. During construction, the two station entrance areas would be secured with appropriate perimeter fencing. Aesthetic shielding would be installed along the perimeters to conceal the construction activities. During construction, the Olympic/Crenshaw Station site would not be visually compatible with the surrounding environment. This impact is not considered significant due to the short-term nature of the construction activities.

The one-story subway station would be constructed within the Crenshaw Boulevard right-of-way by a cut-and-cover method. A trench would be excavated from the surface and the station would be constructed within the trench. As soon as the trench excavation reaches sufficient depth a temporary decking system would be installed over the trench to allow traffic to continue to flow along Crenshaw Boulevard while station construction continues underneath. The temporary decking acts to visually shield the construction of the station. The temporary decking would be visually different from a normal asphalt street, but this difference is not considered a visual incompatibility.

Effects on Existing Views

There are no objects of sensitive views currently located on the southwest or northeast corners of Olympic and Crenshaw Boulevards. The existing gas station, commercial buildings, and the billboards currently located at the intersection do not lend to the visual quality of the area and therefore, the removal of those structures would not adversely effect existing views. Rather, the removal of the billboards would be considered to have a positive visual effect for the residential areas around the site.

Shadow Effects

The removal of the existing structures on the site will reduce the shadows cast in the area. The construction activities will not cast any significant shadows off the site.

Artificial Light Effects

Security Lighting

The lighting associated with the existing structures on-site, including billboard lighting, gas station island lighting, signs, and building, would be removed by the razing of all structures on the southwest and northeast corners of Olympic and Crenshaw Boulevards. Construction security lighting would be installed, but would cast less light than is currently cast by the existing lighting. Overall, the effects of construction lighting at the surface would not be significant.

Construction of the station under the street would be artificially lit throughout the construction phase. This lighting would be shielded from the surface, and would not result in significant lighting effects.

Vehicle Headlights

Light cast by existing vehicle headlights entering the existing uses on the southwest and northeast corners of Olympic and Crenshaw Boulevards would be terminated by the commencement of construction. Light cast by construction truck headlights would be limited since the number of construction trucks on-site would be minimal. Construction workers would park their personal vehicles in an off-site ~~the~~ parking lot ~~on the southwest corner of Wilshire and Crenshaw Boulevards~~ which eliminates their potential light impact.

Glare Effects

Glare would not be a problem on the construction site since there would be no reflective surfaces constructed at the surface.

Pico/San Vicente Underground Station

Impacts created by the construction of the Pico/San Vicente Underground Station are discussed above under Alternative A.

Cut-and-Cover in Crenshaw Boulevard

Visual Compatibility with the Existing Environment

During construction of Alternative C, cut-and-cover construction methods would be required within Crenshaw Boulevard from just north of 8th Street to a point about 1,100 feet south of Country Club Drive. Crenshaw Boulevard would be altered by cut-and-cover construction techniques required to build the concrete boxes that would connect the northern bored tunnels with the southern bored tunnels of this alignment. During the initial stages of excavation in the street there would be a visual incompatibility with the existing environment. Once the concrete decking is installed and traffic returns to a normal, this visual incompatibility would no longer exist.

During the construction period when the concrete decking is removed and the street is returned to normal, there would also be a short period of visual incompatibility with the existing environment. This visual effect is short-term and is not considered significant. Refer also to the discussion for cut-and-cover required for utilities, below.

Alternative C would also require cut-and-cover construction methods for relocating storm drains and sewer lines within the residential neighborhoods on both sides of Crenshaw Boulevard. Figures 7-38 and 7-39 (displayed in Section 7.13, Utilities) shows the areas that would be affected for storm drain and sewer line relocations. These utility relocations would require the acquisition and demolition of 15 single-family residences and one multi-family building. The removal of these swaths of residential units would create a visual incompatibility with the existing residential character of these neighborhoods. During the stages of excavation in the streets and along the swaths of property created by the removal of the residential units there would also be a visual incompatibility with the existing environment. Once the utilities are buried in the streets, the streets would be returned to normal conditions and the visual incompatibility would end. However, where the residential units would be removed the visual incompatibility would continue until such time as a new residential structure would be constructed.

Effects on Existing Views

Crenshaw Boulevard between 8th Street and Pico Boulevard is not a designated scenic highway, and it is not a part of the "unique view" afforded from the residences located south of the Pico/San Vicente Station site. Therefore, cut-and-cover construction within Crenshaw Boulevard would have no effect on existing views.

Shade/Shadow

Cut-and-cover construction activities occur mainly at or below the surface of the ground. Therefore, cut-and-cover construction activities within Crenshaw Boulevard would have no effect on shade or shadows.

Artificial Light

Cut-and-cover construction within Crenshaw Boulevard would not cause artificial light effects on the surrounding residential neighborhoods. During surface construction all activities would occur during daylight hours. During underground construction within the cut-and-cover segment of the alignment artificial lighting would be shielded by the concrete decking installed over the construction area.

Glare

Glare would not be a problem within the cut-and-cover construction area since there would be no reflective surfaces constructed at the surface.

Cut-and-Cover in Pico Boulevard

The aesthetic effects associated with cut-and-cover in Pico Boulevard between Victoria Avenue and the Pico/San Vicente Station are the same as those described above for Alternative A. For a discussion of additional cut-and-cover requirements for utility relocation refer to the discussion below.

Cut-and-Cover for Utility Relocation

As discussed above, prior to construction of Alternative C, cut-and-cover construction would be required for the relocation of storm drain and sewer lines. The placement of new storm drains would occur along 9th Street (between 4th Avenue and Victoria Avenue), proceeding southerly along Victoria Avenue, easterly along Country Club Drive, southerly on Bronson Avenue, and easterly below Country Club Drive and southerly along Crenshaw Boulevard. Refer to Figure 7-38 (Storm Drain Relocations). Relocation of existing storm drains would also occur along Queen Anne Place between 12th Street and southerly to the Pico/San Vicente Station site, and along Pico Boulevard between Mullen Avenue and Windsor Boulevard. Uses along this relocation area are primarily residential (except for Crenshaw Boulevard and Pico Boulevard). Queen Anne Recreation Center is located along Queen Anne Place and the storm drain relocation. During the initial stages of excavation there would be a visual incompatibility with the existing environment prior to the installation of the concrete decking above the street. Once the concrete decking is removed and the street restored to its pre-construction condition there would also be a short period of visual incompatibility with the existing environment. Both visual effects are short-term and therefore not considered significant.

Utility relocation would also require right-of-way acquisition on 9th Street (between 4th and 5th Avenues and Crenshaw Boulevard and Victoria Avenue) and between Bronson Avenue and Victoria Avenue (south of Country Club Drive). Refer to Figure 7-38 (Storm Drain Relocation). Right-of-way acquisition would include demolition of vacant residential structures and excavation of property to place the storm drains. Both stages of construction would be visually incompatible with existing residential uses. However, upon placement of storm drains, cover material, and vegetation these visual effects would be less than significant.

The placement of the sewer lines would be along 9th Street (between 5th Avenue and Victoria Avenue), the proceed southerly along Victoria Avenue and southerly along Crenshaw (two segments), both segments end at Olympic Boulevard. Relocation then continues southerly along Bronson Avenue then easterly (south of Country Club Drive) and another segment along Crenshaw Boulevard. Refer to Figure 7-39 (Sewer Line Relocation). Visual effects would be similar to storm drain cut-and-cover construction as previously discussed. Both relocations would occur at the same time to minimize visual and other impacts. Excavation would be short term and therefore these visual effects would not be significant.

Right of way acquisition would occur along 9th Street (between Crenshaw Boulevard and Victoria Avenue) and south of and approximately parallel to Country Club Drive (between Bronson Avenue and Plymouth Boulevard. Visual effects resulting from right-of-way acquisition are similar to those discussed above for storm drains.

7.10.2.2 Operation and Maintenance

No Project Alternative

Implementation of the No Project Alternative would not result in any significant aesthetic/visual impacts pursuant to the thresholds stated above.

Alternative A (Wilton/Arlington/Pico)

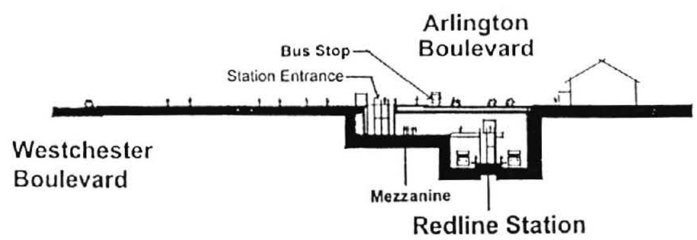
Olympic/Arlington Station Site

Visual Compatibility with the Existing Environment

The station entrance structures would include an elevator structure for handicap access to the mezzanine level of the subway station, and an opening leading to a stairway down to the mezzanine level of the station. The stairway opening is protected on three sides by a short wall. The remainder of the surface area would be level and covered by paving and landscaping~~concrete~~. An 8- to 10-foot high concrete/masonry wall would be constructed along the southern boundary of the entrance area to separate it from the residential area to the south. The wall would be designed in conjunction with a landscaping plan to discourage graffiti and minimize the perceived visibility of the wall. Appropriate Metro Red Line signage would be placed on the site, and landscaping would be planted. The surface facilities at the Olympic/Arlington Station site would be visually compatible with the existing environment. Figure 7-28 shows a conceptual view of the Olympic/Arlington Station site. Excess land not used for the station will be sold and developed per a joint development agreement. Refer to Section 7.4, Land Use.

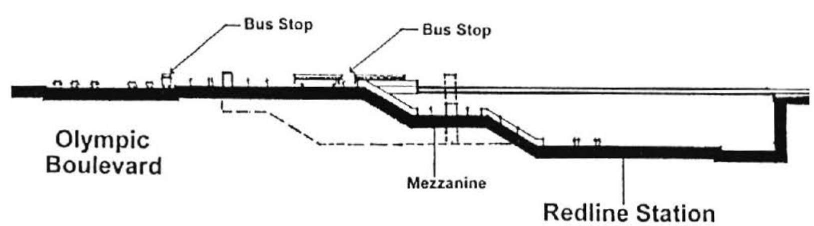
Effects on Existing Views

There are no sensitive views within the immediate vicinity of the Olympic/Arlington Station site. In addition, the Olympic/Arlington Station would not have any structures which would allow the privacy of existing uses be compromised. An 8- to 10-foot concrete/masonry wall would be constructed along the southern boundary of the site which would protect the residential uses immediately south. The use of landscaping in conjunction with the wall would discourage graffiti, and enhance the visual character of the wall.



Section Through Site Looking North

(See Figure 2-2 for location of north section lines)



Section Through Site Looking East

(See Figure 2-2 for location of east section lines)

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FIGURE 7-28

CONCEPTUAL VIEW - OLYMPIC/ARLINGTON STATION SITE (NORTH & EAST SECTIONS) ALTERNATIVES A & B

Shade/Shadow

No structures would be constructed at the Olympic/Arlington Station site that would cast significant shadows off-site.

Artificial Light

Surface lighting at the Olympic/Arlington Station site would include exterior security lighting in open space areas, and pedestrian lighting associated with the entrance structures. These lighting facilities would be shielded and designed to eliminate light intrusion into surrounding residential areas. With these design measures, significant lighting impacts to land uses in the immediate vicinity of this station site would not occur.

Glare

Structures at the station entrance site would be constructed with non-reflective material to prevent the potential for significant glare effects.

Pico/San Vicente Underground Station Site

Visual Compatibility with the Existing Environment

The Pico/San Vicente Underground Station site would include the station plaza and entrance, an expanded Rimpau Bus Terminal, a new kiss-and-ride facility, and a 324-space park-and-ride facility constructed on a deck above the bus facility. The combined bus facility and 324-space parking facility would be about 40 feet in height. A structure that could accommodate 1,000 parking spaces may ultimately be developed at the site, depending on the availability of funding and demand for additional spaces. This facility has not yet been designed, however for purposes of this analysis, it is assumed that a four-level structure built atop the deck of the bus facility could be required to provide for 1,000 spaces. The combined bus facility and parking structure is estimated to be a maximum of approximately 55 feet in height (20 feet for the bus level and 10 feet for each of the first three parking levels, and five feet for a railing securing the fourth level). Ancillary facilities would be located underground.

With the exception of the possible future 1,000-space parking structure, the facilities proposed for the Pico/San Vicente Station site would be built at a lesser scale than the larger commercial structures that currently occupy the site. The parking structure would be similar in height to the tallest elements of the existing buildings on the site. The proposed transit facilities would be consistent with the visual character of surrounding commercial areas along Pico and San Vicente Boulevards. This site is somewhat isolated from the surrounding community due to the major thoroughfares around the site. Steep grade elevations on the south and east side of the site further separate the site from surrounding residential neighborhoods east of West Boulevard and south of Venice Boulevard. The proposed transit facility is an enlargement of the existing transit facility currently operating on the site. It is also physically separated from nearby residences. In addition, redevelopment of the Pico/San Vicente Station site with newly constructed facilities in an master planned arrangement with site specific guidelines and standards that would improve the overall visual character of the site.

Effects on Existing Views

The proposed project would not affect the existing medians on Venice and San Vicente Boulevards or the potential for future landscaping of these medians, and thus would not conflict with the Scenic Highways Plan. Existing views from Venice and San Vicente Boulevards along and near the Pico/San Vicente Station site would be changed by the removal of existing structures on the site and the redevelopment of the site with a station entrance, expanded bus terminal, and kiss-and-ride and park-and-ride facilities. These changes would not adversely affect the quality of these views, and the master planned arrangement of facilities on the site may in fact improve these views. Therefore, significant adverse impacts on these views would not occur.

The Pico/San Vicente Station site does not contribute to the scenic quality of views from residences along the south side of Venice Boulevard. However, views of the Santa Monica Mountains could be compromised if a full 1,000-space parking structure were ultimately built. The groundlevel of the parking structure would be at an elevation of about 140 feet. As described above, the structure is estimated to be 55 feet high, thus the highest point of the structure would be at an elevation of about 195 feet. The ground level of the residences south of Venice Boulevard is at a 170-foot elevation. These residences are one and two stories and attain a height of 15 to 30 feet. These changes would not adversely affect the quality of these views, and the master planned arrangement of facilities on the site may in fact improve these views. Therefore, significant adverse impacts on these views would not occur.

With regards to privacy issues, the closest residential uses are located: north of the site behind the commercial uses along Pico Boulevard, south of the site along Venice Boulevard, and east of the site along Victoria Park Drive. The elimination of existing structures on the Pico/San Vicente Station site, and the proposed redevelopment of the site with transit and transit-related facilities would not make available views that compromise the privacy of nearby residential uses because views of these residences are buffered from the site either by existing structures, grade changes, and/or distance from the site.

That portion of the Pico/San Vicente Station site not developed with transit uses would remain vacant in the near-term. However, the remaining vacant property on the site would eventually be developed through joint development agreements between the MTA and private developers. The effects of this future joint development will be considered in a future environmental document. During the period while the property around the Pico/San Vicente Station is vacant there is a potential for a substantial visual inconsistency if these properties are not sufficiently maintained. For example, without sufficient maintenance, vegetation on the property could become overgrown and fencing around the property, if provided, could become degraded with graffiti. For these reasons, potentially significant visual impacts could occur on this vacant property.

To ensure that this does not occur, a mitigation measure has been added to the project (see Section 7.4 - Land Use) which requires the MTA to maintain vacant properties in such a way as to prevent blighted conditions. Implementation of that mitigation measure would reduce any potential aesthetic impacts to less than significant levels.

Shadow Effects

During the shadow analysis periods identified above, the parking structure would cast morning shadows in a northwesterly direction toward Rimpau Boulevard, noon shadows in a northerly direction toward Mullen Street, and afternoon shadows in a northeasterly direction toward Muirfield Road north of Pico Boulevard.

Shadows from the 40-foot high structure would range from 6 feet at noon during the summer to 83 feet in the afternoon during the winter. These shadows would not extend beyond Pico Boulevard during any time of the year. Therefore, no significant shadow impact would occur with a 40-foot high structure.

Shadows from a 55-foot high structure would range from 9 feet at noon in the summer to 114 feet in the afternoon during winter. Shadows from the 55-foot structure would not extend beyond the sidewalk on the north side of Pico Boulevard. No shadows would be cast onto off-site sensitive visual elements during any time. Consequently, no significant shade/shadow impacts would occur with a 55-foot high parking structure.

Artificial Light

Security, Building, and Pedestrian Lighting

Nighttime lighting would be provided at the Pico/San Vicente Station and its associated facilities. The nearest residences would be those approximately 175 feet to the east on Victoria Park Drive, approximately 120 feet south of the site on Venice Boulevard, and approximately 325 feet north of the site behind one-story commercial uses along Pico Boulevard. The greatest potential for light impacts would be to those residences which face the site from the south side of Venice Boulevard. Lighting at the station site would include exterior security lighting in parking areas and in open spaces, building lighting primarily for the parking structure, and pole- and wall-mounted pedestrian lighting. These lighting facilities would be shielded and designed to eliminate light intrusion into surrounding areas. With these design measures, significant lighting impacts to land uses in the immediate vicinity of this station site would not occur.

Vehicle Headlights

Light cast by vehicle headlights entering the site would be the most prominent at parking entrances and exits. During off-hours, the number of cars entering the site would be limited and headlight glare would be reduced. Light cast by vehicle headlights would be contained in a relatively small area. The impact of vehicle headlights would be less than significant because headlights are typically a physically small source of lighting, are less luminous than building lighting, and illuminate a focused area for short periods of time. Additionally, the site currently is used for parking and therefore, potential impacts associated with vehicle lights would be essentially the same as the existing conditions.

Glare Effects

Structures at the station entrance site would be constructed with non-reflective material to prevent the potential for significant glare effects.

Alternative B (Wilton/Arlington/Venice)

Olympic/Arlington Station Site

Aesthetic impacts created by the operation and maintenance of the Olympic/Arlington Underground Station would be the same as those described above for Alternative A.

Alternative B1 (Venice/San Vicente Open Air-Lower Elevation-Station)

Visual Compatibility with the Existing Environment

The Venice/San Vicente Open Air (Lower Elevation) Station site would include the station plaza and entrance, an expanded Bus Terminal, a new kiss-and-ride facility, and a 324-space park-and-ride facility constructed on a deck above the bus facility. The combined bus facility and 324-space parking facility would be about 40 feet in height. A structure that could accommodate 1,000 parking spaces may ultimately be developed at the site, depending on the availability of funding and demand for additional parking spaces. This facility has not yet been designed, however for purposes of this analysis, it is assumed that a four-level structure built atop the deck of the bus facility could be required to provide for 1,000 spaces. The combined bus facility and parking structure is estimated to be a maximum of approximately 55 feet in height (20 feet for the bus facility, 10 feet for each of the first three parking levels, and a five feet for a railing securing the fourth level). Ancillary facilities would be located underground.

In addition, the station would have a 500 foot tail track that sits within a shallow trench until it terminates just before it reaches San Vicente Boulevard. This tail track would be used to store trains not in service, and to provide extra stopping distance for trains.

With the exception of the possible future 1,000-space parking structure, the transit facilities proposed for the Venice/San Vicente Open Air (Lower Elevation) Station site would be built at a lesser scale than the larger commercial structures that currently occupy the site. The 1,000-space parking structure would be similar in height to the tallest elements of the existing buildings on the site. The proposed transit facilities would be designed to be compatible with the visual character of the surrounding commercial area along Pico Boulevard. The station would be somewhat isolated from the surrounding community due to its setback from Pico Boulevard. The steep grade elevations on the south and east sides of the site further separate the station from surrounding residential neighborhoods east of West Boulevard and south of Venice Boulevard. The newly constructed facilities would likely be viewed as initiating the revitalization of the Venice/San Vicente site. The proposed transit project would improve the overall visual character of the site. As such, the proposed transit facilities are considered visually compatible with the surrounding neighborhood.

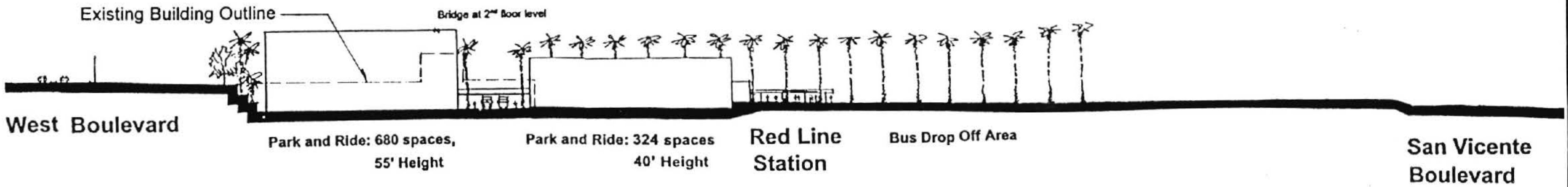
Effects on Existing Views

The following views are considered sensitive for purposes of this analysis:

- The portions of Venice and San Vicente Boulevards adjacent to the Venice/San Vicente Open Air (Lower Elevation) Station site are part of "scenic highways" as designated by the Scenic Highways Plan and therefore are considered sensitive for purposes of this analysis.
- Views from residences along the south side of Venice Boulevard looking north over the Venice/San Vicente Station site. These views are sensitive because they include a scenic and relatively unique panorama of a large area of the city extending to the Santa Monica Mountains.

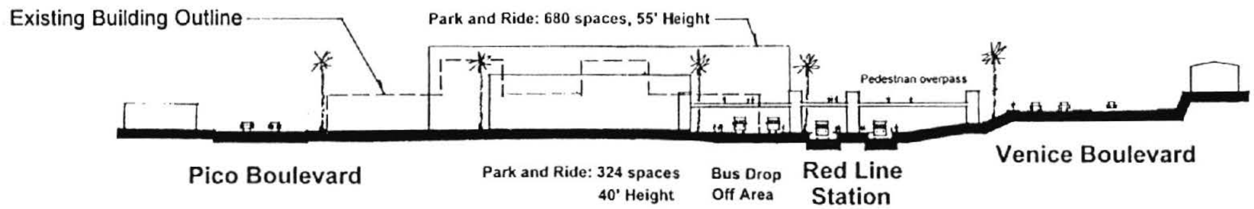
The proposed project would not affect the existing medians on Venice and San Vicente Boulevards or the potential for future landscaping of these medians and thus would not conflict with the Scenic Highways Plan. Existing views from Venice and San Vicente Boulevards along and near the Venice/San Vicente Open Air (Lower Elevation) Station site would be changed by the removal of existing structures on the site and the redevelopment of the site with a station entrance, expanded bus terminal, and kiss-and-ride, park-and-ride facilities, and the 500 foot tail track. These changes would not adversely affect the quality of these views, and the planned arrangement (including site development standards) of facilities on the site may in fact improve these views. Therefore, significant adverse impacts on these views would not occur. Figures 7-29 through 7-31 show various conceptual views of this station and the 500 foot tail track from all vantage points.

The Venice/San Vicente Open Air (Lower Elevation) Station site does not contribute to the scenic quality of views from residences along the south side of Venice Boulevard. However, views of the Santa Monica Mountains could be compromised if a full 1,000-space parking structure were ultimately built. The ground level of the parking structure would be at an elevation of about 140 feet. As described above, the structure is estimated to be 55 feet, thus the highest point of the structure would be at an elevation of about 195 feet. The ground level of the residences south of Venice Boulevard is at a 170-foot elevation. These residences are one and two stories and attain a height of 15 to 30 feet. Given that the parking structure could rise to an elevation of 195 feet, the structure could at least partially obstruct northerly facing views of the mountains from these residences. Therefore, adverse impacts on these views could occur. To ensure that this does not occur, a mitigation measure has been added to the project.



Section Through Site Looking South

See Figure 2-6 for location of south section lines



Section Through Site Looking East

See Figure 2-6 for location of east section lines

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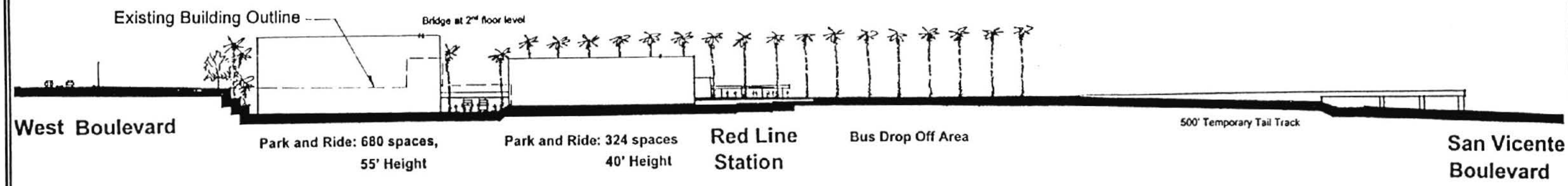
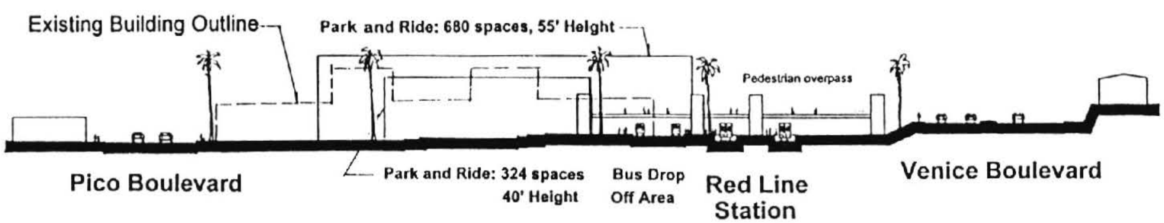
FIGURE 7-29
CONCEPTUAL VIEW - VENICE/SAN VICENTE LOWER ELEVATION STATION (SOUTH & EAST SECTIONS) ALT. B1

METRO



Section Through Site Looking South

See Figure 2-6 for location of south section lines



Section Through Site Looking East

See Figure 2-6 for location of east section lines

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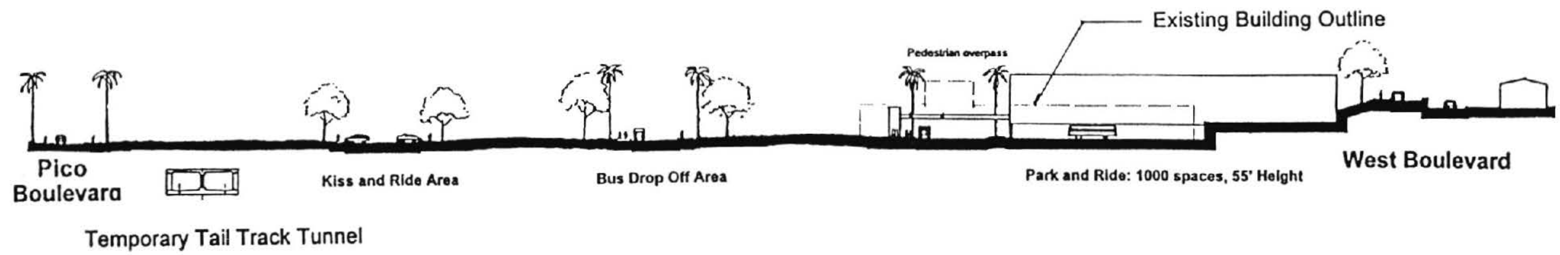
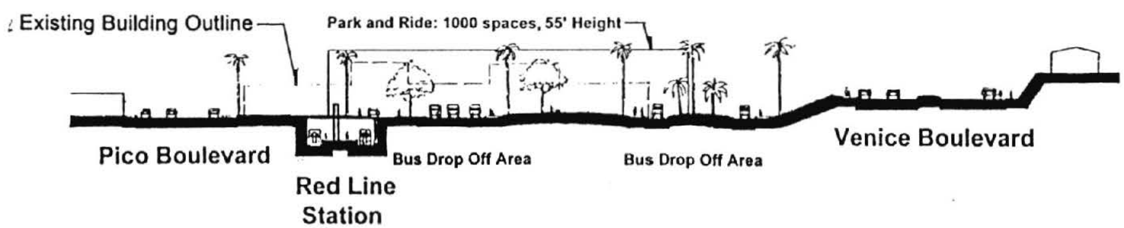
FIGURE 7-30
CONCEPTUAL VIEW - VENICE/SAN VICENTE HIGHER ELEVATION STATION (SOUTH & EAST SECTIONS) ALT. B2



Section Through Site Looking North

See Figure 2-4 for location of north section lines



Section Through Site Looking East

See Figure 2-4 for location of east section lines

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FIGURE 7-31

CONCEPTUAL VIEW - PICO/SAN VICENTE UNDERGROUND STATION (NORTH & EAST SECTIONS) ALTS. A & C

With regards to privacy issues, the closest residential uses are located: north of the site behind the commercial uses along Pico Boulevard, south of the site along Venice Boulevard and east of the site along Victoria Park Drive. The elimination of existing structures on the Venice/San Vicente Open Air (Lower Elevation) Station site and the proposed redevelopment of the site with transit and transit-related facilities would not make available views that compromise the privacy of nearby residential uses because views of these residences are buffered from the site either by existing structures, grade changes, and/or distance from the site.

That portion of the Venice/San Vicente (Higher Elevation) Station site not developed with transit uses would remain vacant in the near-term. However, the remaining vacant property on the site would eventually be developed through joint development agreements between the MTA and private developers. The effects of this future joint development will be considered in a future environmental document. During the period while the property around the Venice/San Vicente (Higher Elevation) Station is vacant there is a potential for a substantial visual inconsistency if these properties are not sufficiently maintained. For example, without sufficient maintenance, vegetation on the property could become overgrown and fencing around the property, if provided, could become degraded with graffiti. For these reasons, potentially significant visual impacts could occur on this vacant property.

To ensure that this does not occur, a mitigation measure has been added to the project (see Section 7.4 - Land Use) which requires the MTA to maintain vacant properties in such a way as to prevent blighting conditions from occurring. Implementation of that mitigation measure would reduce any potential aesthetic impacts to less than significant levels.

<u>Shadow Effects</u>

The 1,000 space parking structure described above would cast shadows essentially the same as those described above for Alternative A. The shadows would not extend quite as far off-site since this parking structure would be located closer to Venice Boulevard than the parking structure for Alternative A.

<u>Artificial Light</u>

<u>Security, Building, and Pedestrian Lighting</u>

The artificial lighting effects associated with security, building, and pedestrian lighting are essentially the same as the effects described above for Alternative A.

<u>Vehicle Headlights</u>

The artificial lighting effects associated with vehicle headlights are essentially the same as the effects described above for Alternative A.

<u>Glare Effects</u>

Structures at the station entrance site would be constructed with non-reflective material to prevent the potential for significant glare effects.

<u>Alternative B2 (Venice/San Vicente Open Air Higher Elevation Station)</u>

The aesthetic effects associated with Alternative B2 are the same as those described above for Alternative B1. The two ~~only~~ differences between Alternatives B1 and B2 are: a) the surface or ground elevation for Alternative B2 would be approximately 15 feet higher than for Alternative B1, and b) ~~is~~ that with Alternative B2 the Venice/San

Vicente (Higher Elevation) Station would have a 500 foot tail track that sits on top of a berm until just before it reaches San Vicente Boulevard where it switches to column supports. This tail track would be used to store trains not in service, and provide extra stopping distance for trains. The tail track on the columns would be at least 16 feet above the surface (ground) elevation where it terminates near the intersection of Pico and San Vicente Boulevards. Figure 7-30 above conceptually displays this station as it would be viewed from Pico Boulevard. These two modifications to the station ~~located at a higher elevation~~ would not change any of the conclusions furnished in the analysis provided above for Alternative B1, and the mitigation measures would remain the same.

Alternative C (Crenshaw/Pico)

Olympic/Crenshaw Underground Station

Visual Compatibility with the Existing Environment

The Olympic/Crenshaw Underground Station site would include two station entrances that would be located at the northeast and southwest corners of the intersection. Station entrances would provide predominantly open plaza areas with Metro Red Line identifying features and an opening to the subway. Ancillary facilities would be located underground.

Proposed station entrances at the northeast and southwest corners of Olympic and Crenshaw Boulevards would not introduce substantial inconsistencies among visual elements in the area. Station entrances would introduce predominantly open plazas among the mix of low-rise commercial structures along Crenshaw Boulevard. These entrances would back up to commercial buildings along Olympic Boulevard and single-family residences along Bronson and Victoria Avenues. Metro Red Line identifying features would be lower in height and smaller in scale than surrounding structures and the station entrances would be consistent with the active commercial character of Olympic and Crenshaw Boulevards. Therefore adverse effects on the visual character of adjacent residential areas along Bronson and Victoria Avenues are not expected. In order to provide noise reduction, concrete masonry walls would be constructed along the boundary of the site that adjoins these residential uses. (Refer to Section 7.11.) This wall would range in height from 8 to 10 feet (for a 1-story or 2-story residential dwelling unit, respectively). If not properly maintained these walls have the potential to attract graffiti and litter. The design of these and associated landscaping would be subject to ~~approval by a~~ design review ~~board~~. Landscaping would minimize the occurrence of litter and graffiti as well as reduce the perceived visibility of the wall. For the above reasons, significant visual compatibility impacts would not occur as a result of the operation and maintenance of the Olympic/Crenshaw Underground Station entrances.

As part of the Alternative C alignment two ventilation structures would be constructed, one at the southwest corner or Norton Avenue and Wilshire Boulevard and the other at the northwest corner of Pico Boulevard and Victoria Avenue. These ventilation structures have the potential to be visually incompatible with the surrounding uses on these streets or attract vandalism or graffiti if protective measures are not implemented.

Effects on Existing Views

There are no sensitive views within the immediate vicinity of the Olympic/Crenshaw Station site. In addition, the Olympic/Crenshaw Station would not be developed with any structures that would allow the privacy of existing uses be compromised. No impact is expected to existing views.

Shadow Effects

Because the proposed station entrances would primarily consist of an open plaza area with only minor aboveground structures, substantial shadows would not be created at these entrances.

Artificial Light

Surface security lighting and pedestrian lighting associated with the entrances to the underground station would be shielded and designed to eliminate light intrusion into surrounding areas. With these design measures, significant lighting impacts to land uses in the immediate vicinity of this station site would not occur.

Glare

Structures at the station entrances would be constructed with non-reflective material to prevent the potential for significant glare effects.

Pico/San Vicente Underground Station

Impacts created by the operation and maintenance of the Pico/San Vicente Underground Station are discussed above under Alternative A.

7.10.3 Cumulative Impacts

7.10.3.1 Construction

No Project Alternative

Implementation of the No Project Alternative would not result in any significant cumulative aesthetic impacts.

Alternative A (Wilton/Arlington/Pico)

Olympic/Arlington Station Site

Visual Compatibility with the Existing Environment

During construction, the station entrance area of the Olympic/Arlington Station site would not be visually compatible with the surrounding environment. This impact is not considered significant due to the short-term nature of the construction activities. This short-term visual compatibility impact would not combine with any of the related projects identified in Section 6.0 for the following reasons: The "Metro Red Line Western Extension" is to far removed in distance and timing; the "Crenshaw/Prairie Line" is too far removed in distance and timing; the "Mid-City Recovery Program" is generally bounded by Pico Boulevard to the north which makes it too far removed in distance; and the "Other Projects Proposed Within the Vicinity" should all be completed before construction begins on this station. Therefore, no significant cumulative visual compatibility impacts should be associated with the construction of the Olympic/Arlington Station.

Effects on Existing Views

There are no objects of sensitive views currently located on the southwest corner of Olympic Boulevard and Arlington Avenue. For this reason construction of the Olympic/Arlington Station would not combine with any of the identified related projects to create a cumulative effect on existing views.

Shadow Effects

Construction of the Olympic/Arlington Station would not create any structures that when combined with the identified related projects would result in cumulative shadow impacts. The related projects are all too far removed in distance and/or timing.

Artificial Lights

Artificial lighting associated with the construction of the Olympic/Arlington Station when combined with the identified related projects would not result in cumulative lighting impacts. The related projects are all too far removed in distance and timing.

Glare

No reflective surfaces would be present on the Olympic/Arlington Station site during construction thereby eliminating the possibility of creating cumulative glare effects when combined with the identified related projects.

Pico/San Vicente Underground Station Site

Visual Compatibility with the Existing Environment

During the construction phase, the Pico/San Vicente Underground Station would not be visually compatible with the surrounding environment. This impact is not considered significant due to the proposed mitigation measures and the short-term nature of the construction activities. This short-term visual compatibility impact would not combine with any of the related projects identified in Section 6.0 for the following reasons: The "Metro Red Line Western Extension" is too far removed in timing; the "Crenshaw/Prairie Line" is too far removed in timing; the proposed project is a first step in redeveloping this site within the "Mid-City Recovery Program" area, and there are no other known redevelopment projects in close proximity to this site; and the "Other Projects Proposed Within the Vicinity" should all be completed before construction begins on this station. Therefore, no significant cumulative visual compatibility impacts should be associated with the construction of the Pico/San Vicente Underground Station.

Effects on Existing Views

There are no objects of sensitive views currently located on the Pico/San Vicente Underground Station site. For this reason construction of the Pico/San Vicente Underground Station would not combine with any of the identified related projects to create a cumulative effect on existing views.

Shadow Effects

Construction activities on the Pico/San Vicente Underground Station site would not create any structures that when combined with the identified related projects would result in cumulative shadow impacts. The related projects are all too far removed in distance and/or timing.

Artificial Lights

Artificial lighting associated with the construction of the Pico/San Vicente Underground Station when combined with the identified related projects would not result in cumulative lighting impacts. The related projects are all too far removed in distance and/or timing.

Glare

No reflective surfaces would be present on the Pico/San Vicente Underground Station site during construction thereby eliminating the possibility of creating cumulative glare effects when combined with the identified related projects.

Cut-and-Cover in Pico Boulevard

Visual Compatibility with the Existing Environment

Cut-and-cover construction activities in Pico Boulevard between Victoria Avenue and the Pico/San Vicente Underground Station would create short-term visual compatibility impacts. These impacts would not combine with any of the identified related projects to form cumulative visual compatibility impacts due to the related projects all being too far removed in distance and/or timing.

Effects on Existing Views

Cut-and-cover construction activities in Pico Boulevard between Victoria Avenue and the Pico/San Vicente Underground Station when combined with any of the identified related projects would not result in cumulative impacts on existing views because the related projects all too far removed in distance and/or timing.

Shadow Effects

Cut-and-cover construction activities in Pico Boulevard between Victoria Avenue and the Pico/San Vicente Underground Station would not create any structures that when combined with the identified related projects would result in cumulative shadow impacts. The related projects are all too far removed in distance and/or timing.

Artificial Lights

Artificial lighting associated with the cut-and-cover construction activities in Pico Boulevard between Victoria Avenue and the Pico/San Vicente Underground Station when combined with the identified related projects would not result in cumulative lighting impacts. The related projects are all too far removed in distance and/or timing.

Glare

Cut-and-cover construction activities in Pico Boulevard between Victoria Avenue and the Pico/San Vicente Underground Station would not create any reflective surfaces that when combined with the identified related projects would result in cumulative glare impacts.

Alternative B (Wilton/Arlington/Venice)

Olympic/Arlington Station Site

The cumulative aesthetic/visual impacts created by the construction of the Olympic/Arlington Underground Station would be the same as described above for Alternative A.

Venice/San Vicente Station Site[2]

Visual Compatibility with the Existing Environment

During the construction phase of the Venice/San Vicente Station the site would not be visually compatible with the surrounding environment. This impact is not considered significant due to the short-term nature of the construction activities. This short-term visual compatibility impact would not combine with any of the related projects identified in Section 6.0 for the following reasons: The "Metro Red Line Western Extension" is too far removed in timing; the "Crenshaw/Prairie Line" is too far removed in timing; the proposed project is a first step in redeveloping this site within the "Mid-City Recovery Program" area, and there are no other known redevelopment projects in close proximity to this site; and the "Other Projects Proposed Within the Vicinity" should all be completed before construction begins on this station. Therefore, no significant cumulative visual compatibility impacts should be associated with the construction of the Venice/San Vicente Station.

Effects on Existing Views

There are no objects of sensitive views currently located on the Venice/San Vicente Station site. For this reason construction of the Venice/San Vicente Station would not combine with any of the identified related projects to create a cumulative effect on existing views.

Shadow Effects

Construction activities on the Venice/San Vicente Station site would not create any structures that when combined with the identified related projects would result in cumulative shadow impacts. The related projects are all too far removed in distance and/or timing.

Artificial Lights

Artificial lighting associated with the construction of the Venice/San Vicente Station when combined with the identified related projects would not result in cumulative lighting impacts. The related projects are all too far removed in distance and/or timing.

2/ The cumulative aesthetic/visual impacts associated with construction are the same for the Venice/San Vicente Open Air (Lower Elevation) Station (Alternative B1) or the Venice/San Vicente (Higher Elevation) Station (Alternative B2).

Glare

No reflective surfaces would be present on the Venice/San Vicente Station site during construction thereby eliminating the possibility of creating cumulative glare effects when combined with the identified related projects.

Alternative C (Crenshaw/Pico)

Olympic/Crenshaw Underground Station

Visual Compatibility with the Existing Environment

During construction, the two station entrance areas for the Olympic/Crenshaw Station would not be visually compatible with the surrounding environment. This impact is not considered significant due to the short-term nature of the construction activities. This short-term visual compatibility impact would not combine with any of the related projects identified in Section 6.0 for the following reasons: The "Metro Red Line Western Extension" is too far removed in distance and timing; the "Crenshaw/Prairie Line" is too far removed in distance and timing; the "Mid-City Recovery Program" is generally bounded by Pico Boulevard to the north which makes it too far removed in distance; and the "Other Projects Proposed Within the Vicinity" should all be completed before construction begins on this station. Therefore, no significant cumulative visual compatibility impacts should be associated with the construction of the Olympic/Crenshaw Station.

Effects on Existing Views

There are no objects of sensitive views currently located on the southwest or northeast corners Olympic Boulevard and Crenshaw Boulevard. For this reason construction of the Olympic/Crenshaw Station would not combine with any of the identified related projects to create a cumulative effect on existing views.

Shadow Effects

Construction of the Olympic/Crenshaw Station would not create any structures that when combined with the identified related projects would result in cumulative shadow impacts. The related projects are all too far removed in distance and/or timing.

Artificial Lights

Artificial lighting associated with the construction of the Olympic/Crenshaw Station when combined with the identified related projects would not result in cumulative lighting impacts. The related projects are all too far removed in distance and timing.

Glare

No reflective surfaces would be present on the Olympic/Crenshaw Station site during construction thereby eliminating the possibility of creating cumulative glare effects when combined with the identified related projects.

Pico/San Vicente Underground Station Site

The cumulative aesthetic/visual impacts created by the construction of the Pico/San Vicente Underground Station would be the same as described above for Alternative A.

Cut-and-Cover in Crenshaw Boulevard

Visual Compatibility with the Existing Environment

Cut-and-cover construction activities in Crenshaw Boulevard from just north of 8th Street to a point about 1,100 feet south of Country Club Drive would create short-term visual compatibility impacts. These impacts would not combine with any of the identified related projects to form cumulative visual compatibility impacts due to the related projects all being too far removed in distance and/or timing.

Effects on Existing Views

Cut-and-cover construction activities in Crenshaw Boulevard from just north of 8th Street to a point about 1,100 feet south of Country Club Drive when combined with any of the identified related projects would not result in cumulative impacts on existing views because the related projects all too far removed in distance and/or timing.

Shadow Effects

Cut-and-cover construction activities in Crenshaw Boulevard from just north of 8th Street to a point about 1,100 feet south of Country Club Drive would not create any structures that when combined with the identified related projects would result in cumulative shadow impacts.

Artificial Lights

Artificial lighting associated with the cut-and-cover construction activities in Crenshaw Boulevard from just north of 8th Street to a point about 1,100 feet south of Country Club Drive when combined with the identified related projects would not result in cumulative lighting impacts. The related projects are all too far removed in distance and/or timing.

Glare

Cut-and-cover construction activities in Crenshaw Boulevard from just north of 8th Street to a point about 1,100 feet south of Country Club Drive would not create any reflective surfaces that when combined with the identified related projects would result in cumulative glare impacts.

Cut-and-Cover in Pico Boulevard

The cumulative aesthetic/visual effects associated with cut-and-cover in Pico Boulevard between Victoria Avenue and the Pico/San Vicente Station are the same as described above for Alternative A.

Cut-and-Cover for Utility Relocation

Cut-and-cover for utility relocation would create short-term visual impacts along the streets previously identified. Property acquisition would create short-term visual impact from demolition of vacant structures and subsequent excavation for storm drain and sewer lines. These impacts would not combine with any of the identified related projects to form cumulative visual compatibility impacts due to the related projects all being too far removed in distance and/or timing.

7.10.3.2 Operation and Maintenance

No Project Alternative

Implementation of the No Project Alternative would not result in any significant cumulative aesthetic/visual impacts pursuant to the thresholds stated above.

Alternative A (Wilton/Arlington/Pico)

Olympic/Arlington Station Site

Visual Compatibility with the Existing Environment

The surface facilities at the Olympic/Arlington Station site would not be visually incompatible with the existing environment. The operation and maintenance activities associated with the Olympic/Arlington Station would not result in cumulative impacts when combined with any of the related projects identified in Section 6.0 for the following reasons: The "Metro Red Line Western Extension" is too far removed in distance and timing; the "Crenshaw/Prairie Line" is too far removed in distance and timing; the "Mid-City Recovery Program" is generally bounded by Pico Boulevard to the north which makes it too far removed in distance; and the "Other Projects Proposed Within the Vicinity" should all be completed before operation and maintenance begins at this station. Therefore, no significant cumulative visual compatibility impacts should be associated with the operation and maintenance of the Olympic/Arlington Station.

Effects on Existing Views

There are no objects of sensitive views currently located on the southwest corner Olympic Boulevard and Arlington Avenue. For this reason operation and maintenance of the Olympic/Arlington Station would not combine with any of the identified related projects to create a cumulative effect on existing views.

Shadow Effects

Operation and maintenance of the Olympic/Arlington Station would not create any structures that when combined with the identified related projects would result in cumulative shadow impacts. The related projects are all too far removed in distance and/or timing.

Artificial Lights

Artificial lighting associated with the operation and maintenance of the Olympic/Arlington Station when combined with the identified related projects would not result in cumulative lighting impacts. The related projects are all too far removed in distance and timing.

Glare

No reflective surfaces would be present on the Olympic/Arlington Station site during operation and maintenance thereby eliminating the possibility of creating cumulative glare effects when combined with the identified related projects.

Pico/San Vicente Underground Station Site

Visual Compatibility with the Existing Environment

During operation and maintenance the Pico/San Vicente Underground Station would be visually compatible with the surrounding environment. The operation and maintenance of the Pico/San Vicente Underground Station would not result in cumulative impacts when combined with any of the related projects identified in Section 6.0 for the following reasons: The "Metro Red Line Western Extension" would extend the Red Line within a subway tunnel towards the west. The tunnel would not be visible to the public and it would not result in a visual incompatibility. The "Crenshaw/Prairie Line" northern terminus station could be located on the south side of the Pico/San Vicente Underground Station and it is expected it would also be visually compatible with the surrounding community. The proposed project is a first step in redeveloping this site within the "Mid-City Recovery Program" area, and there are no other known redevelopment projects in close proximity to this site. The "Other Projects Proposed Within the Vicinity" should all be completed before operation and maintenance begins on this station. Therefore, no significant cumulative visual compatibility impacts should be associated with the operation and maintenance of the Pico/San Vicente Underground Station.

Effects on Existing Views

There are no objects of sensitive views currently located on the Pico/San Vicente Underground Station site. For this reason operation and maintenance of the Pico/San Vicente Underground Station would not combine with any of the identified related projects to create a cumulative effect on existing views.

Shadow Effects

Operation and maintenance activities on the Pico/San Vicente Underground Station site would not create any structures that when combined with the identified related projects would result in cumulative shadow impacts.

Artificial Lights

Artificial lighting associated with the operation and maintenance of the Pico/San Vicente Underground Station when combined with the identified related projects would not result in cumulative lighting impacts. The "Metro Red Line Western Extension" would be in a subway, and not add any new light sources to the site area.

Glare

No reflective surfaces would be present on the Pico/San Vicente Underground Station site during operation and maintenance thereby eliminating the possibility of creating cumulative glare effects when combined with the identified related projects.

Alternative B (Wilton/Arlington/Venice)

Olympic/Arlington Station Site

The cumulative aesthetic/visual impacts created by the operation and maintenance of the Olympic/Arlington Underground Station would be the same as those described above for Alternative A.

Alternative B1 (Venice/San Vicente Open Air Lower Elevation Station Site)

Visual Compatibility with the Existing Environment

During operation and maintenance the Venice/San Vicente Station would be visually compatible with the surrounding environment. The operation and maintenance the Venice/San Vicente Open Air (Lower Elevation) Station would not result in cumulative impacts when combined with any of the related projects identified in Section 6.0 for the following reasons: The "Metro Red Line Western Extension" would be within a tunnel as it exits the site in a westerly direction under San Vicente. As such, it would not be visible to the general public. The "Crenshaw/Prairie Line" station would be constructed under Venice Boulevard south of the Venice/San Vicente Open Air (Lower Elevation) Station, and it would not be readily visible to the general public. The ~~Crenshaw~~ Red Line project is a first step in redeveloping this site within the "Mid-City Recovery Program" area, and there are no other known redevelopment projects in close proximity to this site; and the "Other Projects Proposed Within the Vicinity" should all be completed before construction begins on this station. Therefore, no significant cumulative visual compatibility impacts should be associated with the operation and maintenance of the Venice/San Vicente Open Air (Lower Elevation) Station.

Effects on Existing Views

There are no objects of sensitive views currently located on the Venice/San Vicente Open Air (Lower Elevation) Station site. For this reason operation and maintenance of the Venice/San Vicente Open Air (Lower Elevation) Station would not combine with any of the identified related projects to create a cumulative effect on existing views.

Shadow Effects

Operation and maintenance activities on the Venice/San Vicente Open Air (Lower Elevation) Station site would not create any structures that when combined with the identified related projects would result in cumulative shadow impacts.

Artificial Lights

Artificial lighting associated with the operation and maintenance of the Venice/San Vicente Open Air (Lower Elevation) Station when combined with the identified related projects would not result in cumulative lighting impacts. The "Metro Red Line Western Extension" would be in a subway under Pico Boulevard, and therefore would not add any new light sources to the site area. The Crenshaw/Prairie Station would be constructed under Venice Boulevard south of the Venice/San Vicente Open Air (Lower Elevation) Station, thereby restricting its cumulative lighting effect. New sources of light would be associated with it, but they would not combine with the artificial lights of the proposed project to produce cumulative lighting impacts on the surrounding neighborhoods. All lights would be properly shielded and directed on-site to ensure compatibility with the surrounding uses. The related projects are all too far removed in distance and/or timing.

Glare

No reflective surfaces would be present on the Venice/San Vicente Open Air (Lower Elevation) Station site during operation and maintenance thereby eliminating the possibility of creating cumulative glare effects when combined with the identified related projects.

Alternative B2 (Venice/San Vicente Open Air Higher Elevation Station)

Visual Compatibility with the Existing Environment

During operation and maintenance the Venice/San Vicente Open Air (Higher Elevation) Station would be visually compatible with the surrounding environment. The operation and maintenance the Venice/San Vicente (Higher Elevation) Station would not result in cumulative impacts when combined with any of the related projects identified in Section 6.0 for the following reasons: The "Metro Red Line Western Extension" would be constructed on columns as it exits the Venice/San Vicente (Higher Elevation) Station site in a westerly direction. As such, it would be very visible to the general public. This westerly aerial extension would most likely be extended on the median within San Vicente Boulevard. This extension would most likely continue in an aerial mode to a point west of La Brea Avenue where the topography begins to rise near Orange Drive and Sycamore Avenue. At this point the alignment would probably resume underground. This aerial segment of the western extension of the Red Line would occur many years after the Venice/San Vicente (Higher Elevation) Station has been in operation. As such, its cumulative visual compatibility effect when combined with the proposed project is less than significant. The ~~Crenshaw~~ Red Line is a first step in redeveloping this site within the "Mid-City Recovery Program" area, and there are no other known redevelopment projects in close proximity to this site; and the "Other Projects Proposed Within the Vicinity" should all be completed before construction begins on this station. Therefore, no significant cumulative visual compatibility impacts should be associated with the operation and maintenance of the Venice/San Vicente Open Air (Higher Elevation) Station.

Effects on Existing Views

The effects are the same as described above for Alternative B1. ~~There are no objects of sensitive views currently located on the Venice/San Vicente Open Air (Higher Elevation) Station site. For this reason operation and maintenance of the Venice/San Vicente Open Air (Higher Elevation) Station would not combine with any of the identified related projects to create a cumulative effect on existing views.~~

Shadow Effects

The effects are the same as described above for Alternative B1. ~~Operation and maintenance activities on the Venice/San Vicente Open Air (Higher Elevation) Station site would not create any structures that when combined with the identified related projects would result in cumulative shadow impacts.~~

Artificial Lights

Artificial lighting associated with the operation and maintenance of the Venice/San Vicente Open Air (Higher Elevation) Station when combined with the identified related projects would not result in cumulative lighting impacts. The "Metro Red Line Western Extension" would be constructed on columns as it exists the Venice/San Vicente Open Air (Higher Elevation) Station site in a westerly direction. As such, its lighting would be ~~very~~ visible to the general public. This westerly aerial extension would most likely be extended on the median within San Vicente Boulevard. This extension would most likely continue in an aerial mode to a point west of La Brea Avenue where the topography begins to rise near Orange Drive and Sycamore Avenue. At this point the alignment would probably resume underground. This aerial segment of the western extension of the Red Line would occur many years after the Venice/San Vicente Aboveground Station has been in operation. As such, its cumulative lighting effect when combined with the proposed project is less than significant.

All lights would be properly shielded and directed on-site to ensure compatibility with the surrounding uses. The other related projects are all too far removed in distance and/or timing from the proposed project and site to result in cumulative lighting impacts.

Glare

The effects are the same as described above for Alternative B1. ~~No reflective surfaces would be present on the Venice/San Vicente (Higher Elevation) Station site during operation and maintenance thereby eliminating the possibility of creating cumulative glare effects when combined with the identified related projects.~~

Alternative C (Crenshaw/Pico)

Olympic/Crenshaw Underground Station

Visual Compatibility with the Existing Environment

During operation and maintenance, the two station entrance areas for the Olympic/Crenshaw Station would be visually compatible with the surrounding environment. The operation and maintenance of the Olympic/Crenshaw Station would not result in cumulative impacts when combined with any of the related projects identified in Section 6.0 for the following reasons: The "Metro Red Line Western Extension" is too far removed in distance and timing; the "Crenshaw/Prairie Line" is too far removed in distance and timing; the "Mid-City Recovery Program" is generally bounded by Pico Boulevard to the north which makes it too far removed in distance; and the "Other Projects Proposed Within the Vicinity" should all be completed before construction begins on this station. Therefore, no significant cumulative visual compatibility impacts should be associated with the operation and maintenance of the Olympic/Crenshaw Station.

Effects on Existing Views

There are no objects of sensitive views currently located on the southwest or northeast corners of Olympic Boulevard and Crenshaw Boulevard. For this reason operation and maintenance of the Olympic/Crenshaw Station would not combine with any of the identified related projects to create a cumulative effect on existing views.

Shadow Effects

Operation and maintenance of the Olympic/Crenshaw Station would not create any structures that when combined with the identified related projects would result in cumulative shadow impacts.

Artificial Lights

Artificial lighting associated with the operation and maintenance of the Olympic/Crenshaw Station when combined with the identified related projects would not result in cumulative lighting impacts. The related projects are all too far removed in distance and timing.

Glare

No reflective surfaces would be present on the Olympic/Crenshaw Station site during operation and maintenance thereby eliminating the possibility of creating cumulative glare effects when combined with the identified related projects.

Pico/San Vicente Underground Station Site

The cumulative aesthetic/visual impacts created by the operation and maintenance of the Pico/San Vicente Underground Station would be the same as those described above for Alternative A.

7.10.4 Mitigation Measures

1. To ensure visual compatibility between the construction sites, staging areas, and adjacent residential neighborhoods, the following mitigation measures will be implemented:

   a. The construction sites, including staging areas, will be secured along the perimeter with appropriate fencing. This fencing will be designed to act as shielding to restrict direct groundlevel views into the working area.

   b. No billboards will be posted or replaced during construction and operation.

2. To ensure no aspect of the proposed project could result in excess light offsite on adjacent residential areas the following mitigation measures will be implemented:

   a. During construction, all exterior on-site light fixtures will be directed towards the site and properly shielded. All exterior lights will be restricted to the lowest height that is required for proper performance.

   b. All exterior lighting associated with station design and operation will be in accord with standards recommended by the Illuminating Engineering Society of North America. This will ensure the residential neighborhoods around the stations are protected from spill light.

3. To ensure any properties left vacant after construction and/or utility relocation do not become eyesores in the community the following mitigation measures will be implemented:

   a. All vacant properties will be maintained (including temporary landscaping) and cleared of unsightly and overgrown vegetation. Security fences will incorporate materials that do not attract graffiti and will be easily maintained if graffiti were to occur.

   b. All excess vacant property will be sold or jointly developed as soon as possible after construction activities have been completed.

4. To ensure that ventilation structures associated with Alternative C are compatible with the surrounding visual character of the community and to protect structures from vandalism the following mitigation measure will be implemented:

   a. The ventilation structures will be secured and screened from view to minimize visibility and discourage graffiti and vandalism.

5. To ensure visual compatibility between the station sites and adjacent residential areas the following mitigation measures will be implemented:

   a. Each station site will be well-designed so as to integrate the transit facility with the surrounding community. Station design will follow the established standards contained in the Community Plan and/or Specific Plan in which a facility is located. All station plans will be subject to review and approval of the designated Design Review Board. Standards for review will include the following criteria: landscaping plans (including on and offsite and rooftop landscaping), and parking structure design standards and architectural treatments (to ensure compatibility with the surrounding community character).

b. The design of the 8- to 10-foot walls constructed for development of the Olympic/Arlington and Olympic/Crenshaw stations will be included as part of station design plans submitted for review by the Design Review Board. MTA will maintain these wall and landscape surrounding ground area to minimize the occurrence of litter and graffiti.

7.10.5 Unavoidable Significant Adverse Impacts

No unavoidable significant adverse aesthetic impacts are anticipated.

7.11 NOISE AND VIBRATION

7.11.1 Environmental Setting

Noise Level Characteristics and Effects

Noise can be broken down into two categories when assessing potential project-related impacts: short-term and long-term. Short-term noise is primarily associated with on-site construction activities and off-site heavy-duty truck traffic. Long-term noise is generally associated with off-site mobile sources (i.e., motor vehicle traffic) and on-site activities (e.g., trash pick-ups, landscape maintenance activities, subway operations, and truck deliveries).

Noise is characterized as a function of its sound pressure level (as measured in decibels), frequency (as measured in Hertz or cycles per second), and duration (usually measured in seconds or minutes). The sound pressure level is the perceived "loudness" of a particular sound while the frequency determines the "pitch." The human ear does not respond equally to all frequencies of sound. It responds better to moderate (i.e., speech level) frequencies than it does to very low and high frequencies. Thus, to obtain a value which best represents sound as perceived by the ear, it is necessary to adjust ("weight") or de-emphasize the low and high frequencies relative to the moderate frequencies. There are three basic frequency-adjusted (or weighted) sound levels which accomplish this: the A-weighted sound level, the B-weighted sound level, and the C-weighted sound level. Of these, the A-weighted sound level expressed in A-weighted decibels (dBA), is the descriptor that is almost exclusively used in noise measurements relating directly to the human response to noise.

For purposes of measuring or expressing noise levels over a period of time (i.e., hours or days), several descriptors can be used. The most prominent include the Energy Equivalent Noise Level (Leq) and the Day-Night Noise Level (Ldn). Both of these descriptors express noise levels in terms of the A-weighted decibel and are often employed in land use compatibility assessments.

The Leq is a sound energy level averaged over a specified time period (usually one hour) and represents, in a single numerical value, the amount of actual time-varying sound energy received during the time interval. The strength of the Leq lies in its ability to assess the total time-varying effects of noise on sensitive receptors. The United States Environmental Protection Agency (EPA) has selected the Leq as one of the best environmental noise descriptors due to its reliable evaluation of pervasive long-term noise and good correlation with known effects of noise on individuals.[1]

The CNEL is a time-weighted noise level descriptor that corresponds directly to human sensitivity to noise (particularly during evening and nighttime hours). It results from the summation of hourly Leqs over a 24-hour period with an increased weighting factor applied to the evening and nighttime periods. The daytime period (7:00 A.M. to 7:00 P.M.) receives no weighting, while evening period (7:00 P.M. to 10:00 P.M.) and the nighttime period (10:00 P.M. to 7:00 A.M.) are penalized by 5- and 10-decibel weighting, respectively. Originally designed to analyze the impact of airport noise, the CNEL is now a predominant criterion in measuring roadway noise affecting residential receptors.

An interior CNEL of 45 dBA is mandated by the State of California Noise Insulation Standards (CCR, Title 24, Part 6, Section T25-28) for multiple family dwellings, and is considered a desirable exterior noise exposure for single family dwelling units as well. Exterior standards apply to normally used exterior recreational space (patio,

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[1]/ Environmental Protection Agency, "Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare With an Adequate Margin of Safety," 550/9-74-004, 1974.

porch, pool/spa, etc.). They are also a guide to likely interior noise exposure based on the structural attenuation normally achievable with various types of construction.

The CNEL standards are most commonly applied to transportation-related sources (cars, trucks, trains, planes, etc.) whose noise generation is preempted from local control by state or federal agencies. The Leq standards of noise levels are more commonly applied to those sources that are regulated by local ordinance. Operation of stationary machinery, mechanical equipment, auto repair, construction, or even playing of personal musical devices are typically regulated in terms of Leq criteria. CNEL-based standards are generally used by State and federal agencies and Leq is generally used by local jurisdictions.

Residences, schools, libraries, and medical care facilities have the greatest interior noise sensitivity. A 45 dBA interior noise level has a minimal amount of sleep intrusiveness. For less noise sensitive uses, interior noise levels of 55 dBA are typical for normal conversation, quiet business machine operation, or commercial activity such as retail sales. The combination of exterior noise and the possible range of structural attenuation to achieve a target interior noise level is the basis for the development of a set of noise/land use compatibility guidelines in the Noise Element of the City of Los Angeles General Plan. These CNEL-based noise/land use compatibility guidelines are shown in Table 7-33.

As shown in Table 7-33, noise levels up to 65 dBA CNEL are normally acceptable for noise sensitive uses. Noise exposures up to 75 dBA CNEL are considered normally acceptable for office buildings. Noise levels up to 80 dBA CNEL are normally acceptable for retail, manufacturing, and utility land uses. Except in highly localized environments, ambient noise levels in excess of 80 dBA are uncommon because such levels begin to reach the hearing damage threshold.

Because schools are not occupied on a 24-hour basis, the CNEL standards are not considered optimal for school environments. Los Angeles Unified School District (LAUSD) therefore has adopted noise level standards based upon the noisiest hour of the day (LEQ(1) Max) instead of a weighted 24-hour average. The LAUSD noise level standards are as follows:

School Exterior	-	67 dB [LEQ(1) Max]
School Interior	-	52 dB [LEQ(1) Max]

Existing Sensitive Receivers

Alternative A (Wilton/Arlington/Pico)

Noise-sensitive receivers along this alignment include residences along Wilton Place, Arlington Avenue, and Pico Boulevard, Wilton Place School, several churches, pre-schools along Wilton Place and Pico Boulevard, and a motel.

Alternative B (Wilton/Arlington/Venice)

Noise-sensitive receivers along this alignment include residential uses along Wilton Place, Arlington Avenue and Venice Boulevard, Wilton Place and Pio Pico Schools, several churches, and pre-schools along Wilton Place and Venice Boulevard.

Table 7-33
City of Los Angeles Land Use Compatibility Guidelines for Exterior Community Noise (dBA CNEL)

Land Use	Clearly Acceptable	Normally Acceptable	Normally Unacceptable	Clearly Unacceptable
Residential: Single-Family, Duplex, Mobile Homes	50-60	60-65	65-75	75+
Residential: Multiple Family	50-60	60-65	65-75	75+
Schools, Libraries, Hospitals	50-60	60-65	65-75	75+
Outdoor Spectator Sports, Playgrounds, Neighborhood Parks	50-60	60-65	65-75	75+
Golf Courses, Riding Stables, Water Recreation Cemeteries	50-60	60-70	70-80	80+
Office Buildings, Personal Businesses, Professional	50-65	65-75	75-80	80+
Commercial-Wholesale Some Retail, Industrial, Manufacturing, Utilities	50-70	70-80	80+	---

Source: Department of City Planning, EIR Manual for Private Projects, City of Los Angeles, 1975.

Alternative C (Crenshaw/Pico)

Noise-sensitive receivers along this alignment include residential uses and pre-schools along Crenshaw and Pico Boulevards, and convalescent homes on Crenshaw Boulevard.

Baseline Noise Levels

Alternative A (Wilton/Arlington/Pico)

Two 24-hour noise measurements were conducted at Wilton Place School in the trees near classroom windows facing Wilton Place. Short-term (30 minute) noise measurements were conducted at several noise-sensitive receivers along the alignment. Noise levels (dBA) near the Wilton Place School building facing the roadway were as shown in Table 7-34: The locations where noise measurements where taken is shown on Figure 7-32.

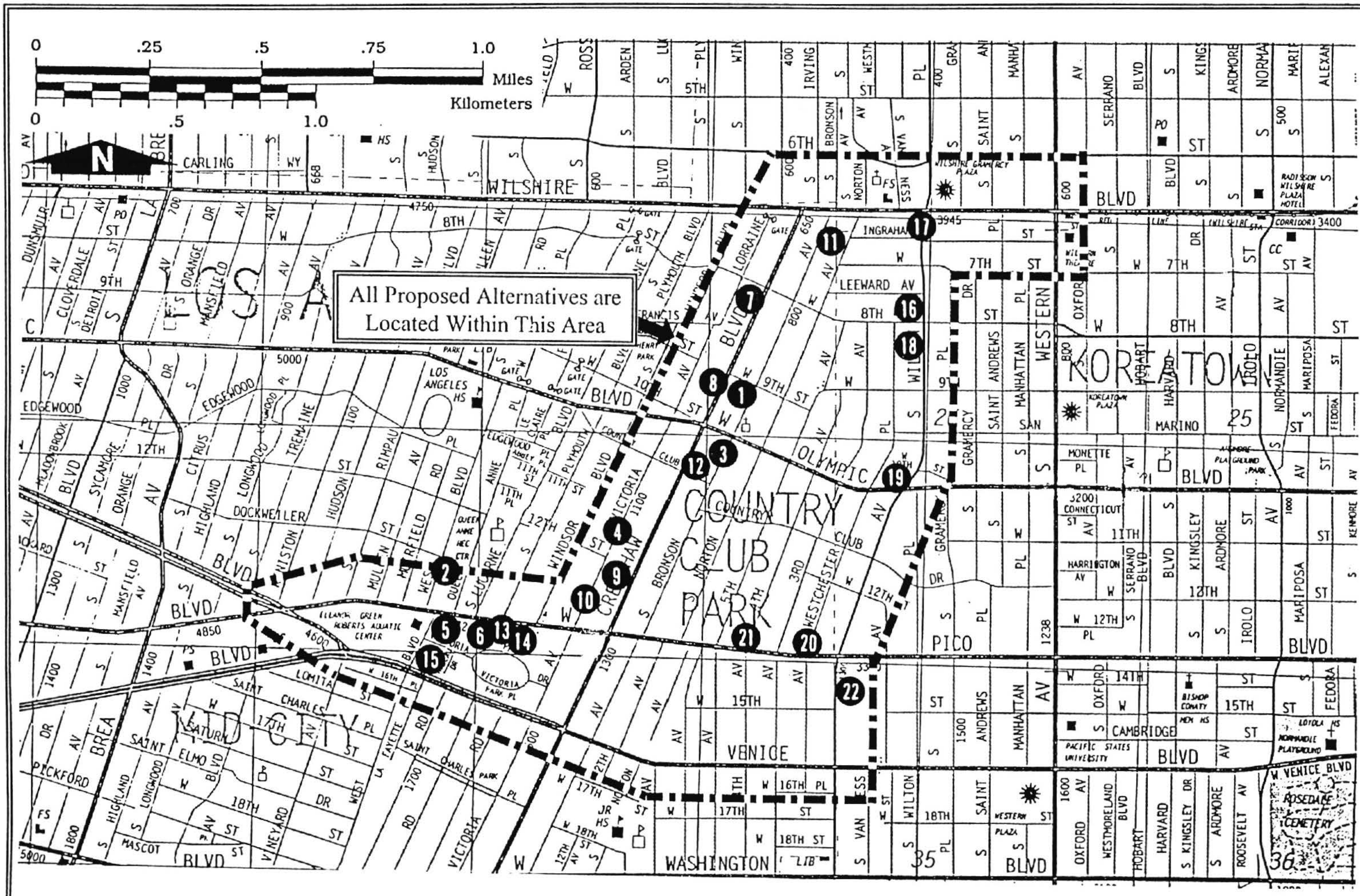
Noise levels on consecutive weekdays were almost identical. Noise levels of 70 dBA during school hours exceed the LAUSD school exposure standard by 3 dBA. The setback of the Wilton Place School building is similar to that of most homes along Wilton Place. An existing CNEL of 72 dBA at homes along Wilton currently exceeds the City of Los Angeles residential exposure standard of 65 dBA CNEL by 7 dBA.

Short-term noise measurements were taken on February 25, 1997; the resulting ~~the following~~ dBA levels are shown in Table 7-35.

Table 7-34 **Existing Noise Levels at Wilton Place School**			
Map No.	Parameter	02/24-25/97	02/25-26/97
16	24-Hour CNEL	72.0 dBA	71.8 dBA
16	Highest 1-Hour Time	70.5 dBA 5:00 - 6:00 PM	70.7 dBA 5:00 - 6:00 PM
16	2nd Highest Hour Time	70.1 dBA 6:00 - 7:00 PM	70.7 dBA 7:00 - 8:00 AM
16	3rd Highest Hour Time	70.0 dBA 8:00 - 9:00 AM	70.6 dBA 6:00 - 7:00 PM
16	Lowest 1-Hour Time	56.1 dBA 3:00 - 4:00 AM	57.8 dBA 3:00 - 4:00 AM

Table 7-35 **Short-term Noise Measurements**							
Map No.	Location	Leq[1]	Lmax[2]	Lmin[3]	L10[4]	L50[5]	L90[6]
17	3970 Ingraham	61.2	74.5	48.5	65.0	57.0	53.5
18	851 Wilton (Youngye Pre-School)	71.8	83.0	54.5	74.5	70.0	63.5
19	Korean Buddhist Temple	72.3	83.0	61.0	75.5	70.5	65.5
20	1255 Westchester	58.1	74.5	46.0	60.5	50.5	48.5
21	1237 4th Avenue	61.7	72.5	49.0	66.0	57.5	52.0

1 Average noise level
2 One-second maximum noise level
3 One-second minimum noise level
4 Value exceeded 10% of the time
5 Value exceeded 50% of the time
6 Value exceeded 90% of the time



ULTRASYSTEMS
ENVIRONMENTAL
INCORPORATED

FIGURE 7-32
NOISE MEASUREMENT LOCATIONS

These readings were short term (30 minutes each) "snapshots," while the City standard is for 24-hour CNEL. Measurements at the school showed, however, that mid-day Leq and 24-hour CNEL were fairly similar. The above data suggest that noise levels at homes along Wilton Place are substantially in excess of the 65 dBA CNEL standard, but that levels along other nearby, less traveled streets are within the 65 dBA criterion.

Alternative B (Wilton/Arlington/Venice)

Noise measurements at the Wilton Place School are the same as those described above for Alternative A. Noise measurements at Pio Pico School on the Arlington Avenue frontage showed noise levels very similar to those at Wilton Place School. Measurements on two school days recorded the ~~following~~ CNELs and hourly averages shown on Table 7-36.

As at Wilton Place School, peak hour levels during the school day at Pio Pico School exceed the LAUSD standard by 3-4 dBA. To the extent that noise levels measured at the school building facade are representative of nearby residences, existing levels of 72-73 dBA CNEL are substantially in excess of the City of Los Angeles standard of 65 dBA CNEL.

Alternative C (Crenshaw/Pico)

Long-term (24 hour) measurements were made in 1995 at five locations in noise-sensitive neighborhoods. Table 7-37 summarizes the results of these measurements. Except for one site which had a reading influenced by an a-typical source (i.e., a rooster crowing), all residential areas not located on major arterial roadways have noise levels within the 65 dBA CNEL (or Ldn) standard.

Long-term monitoring was supplemented with ten short-term (30 minute) measurements in areas potentially affected by implementation of Alternative C.[2] Table 7-38 shows that arterial roadway noise levels during mid-day hours were in the low-70 dB range, while off-arterial levels were in the 50 and low 60 dBA.

Alternatives A, B, and C

For all alternatives, the general conclusion is that existing noise levels along Pico, Venice, and Crenshaw Boulevards are well in excess of City of Los Angeles standards. Along Wilton/Arlington, traffic volumes are somewhat lower, but sensitive receivers are located closer to the roadway. Alternatives A and B thus also have noise exposures in the low 70 dBA range similar to those on more heavily traveled roadways. Off-arterial noise levels along all alternatives are normally within City of Los Angeles General Plan Noise Element guideline levels.

Elevated baseline noise relates to the proposed project in two ways. When levels are already elevated, small changes due to project-related activities would be masked by the baseline. Because human perception of changes in noise levels requires approximately a 3 dBA increase, such increments rarely occur on a project-specific basis because of the logarithmic nature of the decibel scale. Conversely, if noise levels already exceed standards, then any small increment would nevertheless exacerbate an existing adverse situation. It is the cumulative effect of many such small increments that may create a significant increase in the future noise environment even if an elevated baseline masks any individual impact increments.

[2]/ Short-term measurements along Pico Boulevard and Victoria Park Drive also apply to Alternative A.

Table 7-36
Existing Noise Levels at Pio Pico School

Map No.	Parameter	02/24-25/97	02/25-26/97
22	24-Hour CNEL	72.3 dBA	72.7 dBA
22	Highest 1-Hour Time	71.2 dBA 8:00 - 9:00 AM	71.7 dBA 7:00 - 8:00 AM
22	2nd Highest Hour Time	70.9 dBA 7:00 - 8:00 AM	71.2 dBA 8:00 - 9:00 AM
22	3rd Highest Hour Time	70.3 dBA 6:00 - 7:00 PM	70.4 dBA 110 - 120 AM
22	Lowest 1-Hour Time	56.6 dBA 3:00 - 4:00 AM	58.8 dBA 3:00 - 4:00 AM

Table 7-37
24-hour Noise Monitoring Results
(All sound levels in terms of dBA)

Map No.	(Leq) Location	Start		Day-Night Equivalent Level (Ldn)	Peak Hourly Energy-Equivalent Level	
		Date	Time		Leq	Hour
1	911 Bronson Avenue	4/24/97	5 PM	58	55	6 PM
2	1288 West Blvd.	4/24/97	6 PM	62	61	5 PM
3	1043 Bronson Avenue*	4/26/97	1 PM	67	68	10 AM
4	1146 Victoria Avenue	4/26/97	1 PM	56	54	8 PM
5	4433 Victoria Park Drive	9/11/95	1 PM	57	57	8 AM

* Measurements at site LT3 include rooster noise that caused a 4 to 5 dBA increase in overall noise exposure.

Source: Harris Miller Miller & Hanson, 1995

Table 7-38
Short-term Noise Monitoring Results

Map No.	Location	Date	Start Time	30-Min. Leq (dBA)	Dominant Traffic Source	Traffic Counts (Equiv. Vehicles/hour)		
						Cars	Medium Trucks	Heavy Trucks
6	4436 Pico Blvd.	4/25/97	11:47 AM	71	Pico Bl., WB Pico Bl., EB	653 598	38 36	2 5
7	Wilshire Haven 827 Crenshaw Blvd.	4/25/97	03:15 PM	70	Crenshaw, NB Crenshaw, SB	972 810	48 24	6 6
8	Windsor Garden Convalescent Home, Crenshaw Blvd.	4/25/97	04:41 PM	74	Crenshaw	**	**	**
9	A+ Learning Center Crenshaw Blvd.	4/26/97	02:13 PM	71	Crenshaw, NB Crenshaw, SB	1,116 984	21 18	0 6
10	1262 Victoria Avenue	4/27/97	09:53 AM	61	Victoria Ave.	**	**	**
11	658 Bronson Avenue	4/27/97	11:01 AM	60	Bronson Ave.	**	**	**
12	4103 Country Club Dr.	4/26/97	03:31 PM	58	Country Club Dr.	**	**	**
13	4436 Pico Blvd.	9/12/95	10:21 AM	69	Pico Bl., WB Pico Bl., EB	644 536	36 32	4 0
14	4424 Victoria Park Drive	9/12/95	11:30 AM	52	Victoria Park Dr.	**	**	**
15	4466 Victoria Park Drive	9/12/95	12:25 PM	53	Victoria Park Dr.	**	**	**

** Traffic Counts not available.

Source: Harris Miller Miller & Hanson, 1995

Vibration and Ground-borne Noise

Vibration Characteristics and Effects

When vibration travels through a substance, the molecules that comprise the substance are shaken. In dense substances like bedrock, the molecules are packed together more than in loose substances like sand. When molecules are closer together, like in bedrock, vibration is easily conveyed from one molecule to another with very little reduction in the intensity of the shaking. Therefore, vibration initiated at one point travels quickly (at the local speed of sound of the material) and is felt just as intensely at some other point. Conversely, a loose or saturated substance (like the marine terrace deposits to be encountered in Mid-City project area) dampens or limits the vibration from traveling across molecules.

Vibration may be expressed in terms of how far an object is moved (displacement), how fast it oscillates (velocity), or how quickly the oscillation reverses direction (frequency). The most common descriptor is the velocity. Velocity is constantly changing in a vibrating system such that either the average or the maximum vibration velocity best characterize the system. The root-mean square (RMS) average and the peak particle velocity, in inches or centimeters per second, are the most common vibration descriptors.

Because ambient vibration velocity levels are on the order of thousandths of inches per second, decibel notation is used in vibrating systems to make numbers manageable. A decibel is simply a logarithmic ratio of any physical quantity to a reference quantity. Decibels are thus often used in vibration terminology. Vibration decibels, most commonly referenced to one micro-inch per second, are the descriptor used in this discussion. They should not be confused with airborne noise decibels because "decibel" is a generic parameter. Vibration decibels will be written as "VdB" to reduce any possible confusion.

When physical systems vibrate, the shaking action may also produce audible noise (when the vibration occurs at a rate in excess of about 20 cycles per second or Hertz (Hz)). Large physical systems such as structures with good absorption characteristics have relatively low dominant vibration frequencies. The human ear is not very sensitive to low frequencies. At low frequencies, ground-borne noise levels as perceived by humans are 35-40 dBA less than vibration decibels (referenced to 1.0×10^{-6} in/sec). The typical human response to vibration is as follows:

Vibration Velocity	**Ground Noise***	**Human Response**
65 VdB	25-30 dBA	Vibration perception threshold. Sound usually inaudible.
75 VdB	35-40 dBA	Vibration clearly perceptible and may be perceived as annoying. Noise audible, but not sleep-disturbing.
85 VdB	45-50 dBA	Vibration normally unacceptable. Noise very disturbing in bedrooms, libraries, or other normally quiet areas.

* = For vibration spectrum with peaks near 30 Hz.
Source: DOT-T-95-16 (April, 1995)

Vibrations are commonly measured using a device known as an accelerometer. This device consists of a small ~~piezoelectric~~ crystal shaped in such a fashion so as to produce a small electrical charge when it is vibrated. This electrical charge is then fed via a cable assembly into a spectrum analyzer which displays the frequency content and magnitude of the electrical signal. By calibrating the accelerometer, the electrical signal then becomes a direct representation of the vibration present and hence indicates the acceleration, velocity, or displacement present at the point of interest.

Existing Vibration (All Alternatives)

Common sources of perceptible ground-borne vibration are railroad or rail transit trains, construction operations such as blasting or pile driving, and industrial operations such as metal forming; none of which exist within the study area. Ground vibration was measured at five monitoring sites in the Mid-City area. The ambient vibration measurements were all made with high-sensitivity accelerometers mounted on sidewalk or paved surfaces.

The results of the ambient vibration measurements are summarized in Table 7-39. The maximum vibration level, the typical vibration, and the minimum vibration level for each measurement site are shown. (For additional information the reader is referred to "Transit Manual Vibration Impact Assessment," Harris Miller Miller & Hanson, in the MTA Library, One Gateway Plaza, 15th Floor, Los Angeles.) As noted above, the human threshold at which ~~for~~ vibration is acceptable ~~delectability~~ is 65 VdB. Some observations from the vibration testing are:

- Existing maximum levels of ground vibration in the study area are generally below the threshold of human perception.
- Vehicular traffic is the primary source of existing vibration.
- The highest vibration levels are caused by ~~buses and~~ occasional trucks and buses on Crenshaw, Wilshire, Venice, and Pico Boulevards, and Wilton Place and Arlington Avenue.

Table 7-39
Vibration Monitoring Results

Map No.[1]	Site	Root-Mean Square (RMS) Vibration Velocity Levels (VdB referenced to 1 μin./sec.)		
		Maximum	Typical Ambient	Minimum
7	827 Crenshaw Blvd., Wilshire Haven	59	50	43
9	A+ Learning Center Crenshaw Boulevard	50	45-50	40
10	1262 Victoria Avenue	49	40	35
11	3966 Wilshire Boulevard	51	40	30
12	658 Bronson Road	52	40	35

[1] See Figure 7- 32 (Noise Measurement Locations). The location of the vibration monitoring is the same as for the noise monitoring.

Source: Harris Miller Miller & Hanson, 1995

7.11.2 Project Impacts

Thresholds of Significance Criteria for Air-borne Noise

There is a wide variation in how people respond to environmental noise, which means that noise impact is strongly subjective. Over the years there has been considerable research into community response to different types of noise sources in an attempt to find correlations between measured noise levels and community annoyance. The overall goal of criteria for acceptable levels of community noise is to:

- Provide a means of objective comparisons of the noise impacts of different alternatives.
- Identify areas where noise mitigation should be considered and provide system designers with a fair and impartial method of determining where noise mitigation measures, such as resiliently supported ties and sound walls, should be installed.

- Ensure that all reasonable steps are taken so that noise levels within the area of potential project impact would not be an unreasonable burden on residents and other noise sensitive receptors exposed to the noise.
- Provide a basis for evaluating isolated individual claims in proper perspective with statistically-based, integrated group responses. Achieving the goal of an "acceptable" impact does not mean that there would be no community complaints about noise unless an unrealistically low noise impact threshold were used in the assessment.

One or more of the following noise impact criteria are used for most rail projects:

- American Public Transit Association (APTA) has specified design guidelines[3] that are based on the maximum sound levels as a train passes (Lmax). These limits have been used since the late 1960's with only minor modifications and were designed to be applied to urban rail transit systems. These Noise Design Goals can be used in assessing noise impact when electric rapid transit trains are the only alternative being considered. The APTA Guidelines with minor variations were used for the previous environmental assessments of the Red Line segments.
- The noise impact criteria included in the recently published FTA Guidance Manual.[4] These criteria are intended to apply to all types of federally funded transit projects ranging from high-speed urban transit to bus terminals.
- Federal Transit Agency (FTA) has established guidelines for all federally funded transit projects. These guidelines use the day-night level (Ldn) metric for residential exposure and the noisiest single hour (Leq) for sensitive land uses occupied only during the day-time (e.g., schools).
- Federal Highway Administration (FHWA) has developed Noise Abatement Criteria (NAC) that are normally applied to roadway noise sources when traffic volumes are modified as a result of a transit project. FHWA NACs are based on the single noisiest hour of the day (Leq). FHWA thresholds are somewhat unique in that a noise impact is presumed to exist for any incremental impact, regardless of magnitude, if NACs are already exceeded.
- City of Los Angeles noise/land use compatibility guidelines use the CNEL standard and apply it to those noise sources ~~over which~~ that they cannot establish ~~City is preempted from establishing~~ noise limits for (such as cars ~~on-road vehicles~~, trains ~~of all kinds~~, and aircraft, etc.). The City also has a noise ordinance that regulates fixed noise sources such as mechanical equipment or tunnel vents. In order to accommodate federal project involvement as a funding and technical resource, noise impacts in other Metro Rail environmental documents have used the FTA noise impact criteria for train noise. For project-related traffic, monitoring experience has shown that the 67 dBA (Leq) NAC

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[3]/ *Guidelines for Design of Rail Transit Facilities,* American Public Transit Association (APTA), 1981.

[4]/ *Transit Noise and Vibration Impact Assessment,* prepared by Harris Miller Miller & Hanson Inc. under contract to the Office of Planning, Federal Transit Administration, U.S. Department of Transportation, Final Report, April 1995.

for noise-sensitive uses is violated if the 65 dBA CNEL City of Los Angeles standard is also violated. The CNEL representation of traffic noise impacts is ~~therefore~~ used in this analysis because it represents a slightly more stringent constraint than the FHWA NAC. A violation of the City's noise guidelines where none now exists, or a measurable increase (defined as +1 dBA) where levels already exceed the City's standards, will be considered a significant traffic noise impact.

In this project, the new FTA Criteria have been used as the primary criteria for assessing potential noise impacts. They are founded on well-documented research on community reaction to noise and are based on change in noise exposure using a sliding scale. The amount that the transit project is allowed to change the overall noise environment is reduced with increasing levels of existing noise. Ldn is used to characterize noise exposure for residential areas and daytime Leq is used for other noise sensitive land uses such as school buildings.

The FTA noise impact criteria include two levels of impact: "severe impacts" and "impacts." FTA recommends that noise mitigation be implemented for severe impacts unless there is no practical method of mitigating the noise. FTA also recommends that mitigation be considered for impacts that are not severe, but that other factors such as cost-effectiveness be considered when determining whether or not mitigation will be implemented. Both of these impact levels are considered significant under the California Environmental Quality Act (CEQA) for purposes of this document.

Train noise impacts are considered significant if they exceed the FTA Impact Criteria. FTA criteria distinguish between "impacts" and "severe impacts." These 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.

The criteria are summarized in Table 7-40. The first column shows the existing noise exposure and the remaining columns show the additional noise exposure caused by the transit project that are necessary for the two levels of impact. The future noise exposure would be the combination of the existing noise exposure and the additional noise exposure caused by the transit project. As the existing noise exposure increases the amount that the transit project can increase the overall noise exposure before there is an impact decreases.

Thresholds of Significance Criteria for Vibration and Ground-borne Noise

Although there has been relatively little research as to human response to building vibration, experience with ground-borne vibration from rail systems and other common vibration sources indicates that:

Table 7-40
FTA Train Noise Impact Criteria
(All noise levels rounded off to the nearest dBA)

Existing Noise Exposure Leq or Ldn[1]	Project Noise Exposure Impact Thresholds, Leq or Ldn[1]			
	Category 1 or 2 Sites		Category 3 Sites	
	Impact	Severe Impact	Impact	Severe Impact
<43	Ambient + 10	Ambient + 15	Ambient + 15	Ambient + 20
43-44	52	58	57	63
45	52	58	57	63
46-47	53	59	58	64
48	53	59	58	64
49-50	54	59	59	64
51	54	60	59	65
52-53	55	60	60	65
54	55	61	60	66
55	56	61	61	66
56	56	62	61	67
57-58	57	62	62	67
59-60	58	63	63	68
61-62	59	64	64	69
63	60	65	65	70
64	61	65	55	70
65	61	65	66	71
66	62	67	67	72
67	63	67	68	72
68	63	58	68	73
69	64	59	69	74
70	65	59	70	74
71	65	70	70	75
72-73	65	71	70	76
74	65	72	70	77
75	65	73	70	78
76-77	65	74	70	79
>77	65	75	70	80

1. Ldn is used for land uses where nighttime sensitivity is a factor; Daytime Leq is used for land use involving only daytime activities.

Source: Harris Miller Miller & Hanson, 1995

- As noted above, the root-mean square (RMS) average and peak particle velocity are the most common vibration descriptors. Where the vibration is not expected to cause physical damage, but is of nuisance value, ground-borne vibrations, such as from the operation of the trains, is subject to RMS vibration criteria. This is contrasted with vibration that has the ability to create physical damage, such as from blasting, which is expressed in terms of peak particle velocity. 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, limits for acceptable levels of residential ground-borne vibration are usually between 70 and 75 VdB.
- Ground-borne noise (mainly from structures rattling at their various resonant frequencies) is most intrusive in sleeping quarters. A level of 35 dBA has been found to have minimal potential for waking sleeping persons, especially if they have become psychologically adapted to the noise from repeated exposure.

Tables 7-41 and 7-42 summarize the impact criteria for ground-borne vibration and ground-borne noise applicable to urban transit systems that are included in the FTA Guidance Manual.[5] These criteria are based on previous standards, criteria, design goals including ANSI S3.29,[6] and the APTA Guidelines.[7]

7.11.2.1 <u>Construction Impacts</u>

Methodology

Noise Assessment

Construction noise varies greatly depending on the construction process, type and condition of equipment used, and layout of the construction site. Many of these factors are traditionally left to the contractor's discretion, which makes it difficult to accurately estimate levels of construction noise. Overall, construction noise levels are governed primarily by the noisiest pieces of equipment. For most construction equipment, the engine, which is usually diesel, is the dominant noise source. For special activities such as pavement breaking, noise generated by the actual process dominates.

Table 7-43 summarizes some of the available data on noise emissions of construction equipment from the FTA Guidance Manual. Shown are the average sustained values at a distance of 50 feet. Although the noise levels in the table represent typical values, there can be wide fluctuations in the noise emissions of similar equipment. Construction equipment often has markedly variable duty cycles during any given time period ranging between full power and prolonged idling. Such equipment is often mobile such that the source-receiver distance is not constant.

5/ Transit Noise and Vibration Impact Assessment, prepared by Harris Miller Miller & Hanson, Inc., under contract to the Office of Planning, Federal Transit Administration, U. S. Dept. of Transportation, Final Report, April 1995.

6/ American National Standard: Guide to Evaluation of Human Exposure to Vibration in Buildings, ANSI S3.29-1983, Acoustical Society of America, 1983.

7/ Guidelines for Design of Rail Transit Facilities, American Public Transit Association (APTA), 1981.

Table 7-41
FTA Impact Criteria for Ground-borne Vibration and Noise
(As applicable to urban transit systems)

Land Use Category	RMS Ground-borne Vibration[1]	Ground-borne Noise
Category 1: Buildings where low ambient vibration is essential for interior operations. The limits are based on acceptable vibration for moderately vibration sensitive equipment such as optical microscopes or electron microscopes with vibration isolation bases.	65 VdB	—
Category 2: Residences and buildings where people normally sleep.	72 VdB	35 dBA
Category 3: Institutional such as schools and offices with primarily daytime use.	75 VdB	40 dBA

1. Given in terms of RMS vibration velocity level in decibels relative to 1 μin./sec.

Source: Harris Miller Miller & Hanson, 1995

Table 7-42
Ground-borne Vibration and Noise Criteria for Special Buildings
(As applicable to urban transit systems)

Type of Building or Room	RMS Ground-borne Vibration[1]	Ground-borne Noise
Concert Hall	65 VdB	25 dBA
TV Studio	65 VdB	25 dBA
Recording Studio	65 VdB	25 dBA
Auditorium	72 VdB	30 dBA
Church	72 VdB	35 dBA
Theater	72 VdB	35 dBA

1. Given in terms of RMS vibration level in decibels relative to 1 μin./sec.

Source: Harris Miller Miller & Hanson, 1995

Table 7-43
Construction Equipment Noise Emission Levels

Equipment Type	Typical Sound Level at 50 FT (dBA)
Backhoe	80
Bulldozer	85
Compactor	82
Compressor	81
Concrete Mixer	85
Concrete Pump	82
Crane, Derrick	88
Crane, Mobile	83
Loader	85
Pavement Breaker	88
Paver	89
Pump	76
Roller	74
Truck	88
Source: Harris Miller Miller & Hanson, 1995	

Construction noise exposure at a given noise-sensitive location depends on the magnitude of noise during each construction phase, the duration of the noise, and the distance from the construction activities. Obstruction of the source-receiver pathway would also strongly affect noise exposure because transmission of sound waves is predominantly a line-of-sight process. Projecting construction noise requires a construction scenario of the equipment likely to be used and the average utilization factors or duty cycles (i.e., the percentage of time during operating hours that the equipment operates under full power during each phase). Using the typical sound emission characteristics, as given in Table 7-43, it is then possible to estimate Leq or Ldn at various distances from the construction site for a representative construction equipment mix for various generic types of project-related construction activities. Table 7-44 below lists the estimated Lmax and Leq at 50 feet for the major construction tasks planned for the project, based on the emission levels in Table 7-43 and equipment and usage factors from prior Metro rail project

Table 7-44
Estimated Noise Generated by Major Construction Tasks

Construction Task	Typical Sound Level at 50 feet (dBA)	
	Lmax	Leq (8 hour)
Utility Relocation	91	86
Site Clearing	92	87
Bored Tunnel Excavation	92	89
Bored Tunnel Construction[1]	90	86
Cut-and-Cover Tunnel Excavation	102	92
Cut-and-Cover Tunnel Construction	95	90
Station Construction	95	90

1/ Ground-borne noise.
Source: Harris Miller Miller & Hanson, 1995.

experience, as well as from other projects in the Los Angeles area.[8] The estimates assume an 8-hour workday.

In addition to those noise impacts that occur in proximity to the activity itself, trucks that deliver construction materials or haul away spoils may expand the zone of construction noise impact to well outside the actual disturbance area. Adverse truck noise impacts may occur if traffic occurs near sleeping residents at night or if the truck passage impacts quiet daytime activities such as school students, napping day care children, church services, etc..

Vibration

Construction activity vibration and its attendant ground-borne noise are similarly variable as equipment noise. Vibration may cause structural damage, it could interfere with noise- or vibration-sensitive land uses such as recording or TV studios, or it could be annoying to people sleeping. Vibration levels that cause structural damage are generally higher than those that cause a possible intermittent nuisance.

Assessment of construction vibration impact potential was based on observations from similar construction projects in similar geological environments. These studies have shown that the likely maximum distance

8/ East Central Interceptor Sewer Noise and Vibration Impact Analysis, Harris Miller Miller & Hanson, Report No. 292330-3.1, prepared for Myra L. Frank & Associates, March 1994.

for vibratory structural damage is 70 feet from the activity. Perceptible vibration at levels below those capable of causing any structural response are usually confined to 100 feet of the source.

Construction Noise Impacts

No Project Alternative

The No Project Alternative would not result in construction noise.

Introduction to Alternatives A, B, and C

The following discussion addresses impacts of the proposed project alternatives. Noise and vibration from construction have the potential to cause temporary, short-term impact at sensitive land uses near construction activities. Many of the details necessary for making accurate predictions of construction noise and vibration, such as specific construction procedures, type and condition of equipment used, and layout of the construction site, are traditionally left to the contractor's discretion, and cannot be precisely determined at this stage of the project. However, preliminary estimates have been made based on the information available, using general models for construction noise and vibration. The results of the construction noise and vibration assessment are discussed below.

Noise impact thresholds are generally higher for non-permanent noise sources such as construction than for permanent noise sources such as highways or transit systems. While it is recognized that some people will find construction noise equally annoying, the construction is temporary, and factors such as property values are not permanently affected. The FTA Guidance Manual[9] recommends construction noise limits in terms of 8-hour Leq as a function of time of day and land use. For residential land uses, the impact threshold is 80 dBA for daytime periods and 70 dBA for nighttime periods. For commercial land uses, the limit is 85 dBA for both daytime and nighttime periods.

Table 7-45 lists the approximate distances from the construction site to which noise impact is projected, based on the noise limits listed below and the reference noise levels at 50 feet listed in Table 7-44. For estimating attenuation of noise as a function of distance, construction noise has been modeled as a point source centered at the middle of the construction site. The impact distances assumed no acoustic shielding or intervening rows of buildings between sensitive land uses and the construction site for distances out to 150 feet. At least one row of intervening buildings is assumed to exist between the construction site and sensitive land uses 150 feet or more from the construction site. The table indicates that for the noisiest activities, construction noise impact is projected out to distances of 315 feet for nighttime construction near residential land uses, and 150 feet for daytime construction near residential land uses.

9/ Transit Noise and Vibration Impact Assessment, prepared by Harris Miller Miller & Hanson, Inc. under contract to Office of Planning, Federal Transit Administration, U.S. Dept. of Transportation, Final Report, April 1995.

Table 7-45
Estimated Construction Noise Impact Distances

Construction Task	Approximate Noise Impact Distance (feet)			
	Daytime Residential	Daytime Commercial	Nighttime Residential	Nighttime Commercial
Utility Relocation	100	60	160	60
Site Clearing	115	65	180	65
Bored Tunnel Excavation	140	80	225	80
Bored Tunnel Construction	100	60	160	60
Cut-and-Cover Tunnel Excavation	150	115	315	115
Cut-and-Cover Tunnel Construction	150	90	250	90
Station Construction	150	90	250	90

Source: Harris Miller Miller & Hanson, 1995.

Alternative A (Wilton/Arlington/Pico)

Four existing buildings would be demolished on the southwest corner of Olympic Boulevard and Arlington Avenue to create a construction staging area for the Olympic/Arlington Station. Two additional structures would be acquired, one on Arlington Avenue and one on Westchester Place, for construction office space.[10] The construction staging and the area within Arlington Avenue where the station box would be constructed would have residential dwelling units within its 150-foot noise "envelope." In the absence of mitigation, a temporary significant noise impact would occur. This potential impact would be exacerbated by the removal of the three structures along Arlington Avenue that currently partially shield residences along Westchester Place from traffic noise.

Cut-and-cover within Pico Boulevard between Victoria Avenue and West Boulevard~~the Pico/San Vicente Station site~~ would create noise impacts as described above in Tables 7-44 and 7-45. The nearest residential uses are somewhat screened by the commercial buildings that front Pico Boulevard. Once the concrete decking has been put in place, typical daytime traffic noise levels on Pico Boulevard would create a masking affect that would reduce the noise levels associated with tunnel excavation and construction under the concrete decking. Unless highly noisy construction activities are conducted at night, temporary noise

[10]/ See Section 7.6 for details on which structures would be acquired, demolished, and used for office space.

impacts from the Pico Boulevard cut-and-cover component of this alternative would be less than significant.

At the Pico/San Vicente Station, the nearest residential uses to the north are screened by intervening commercial structures along Pico Boulevard. Elevated daytime traffic noise levels would also create a masking effect that would reduce construction activity audibility. Unless highly noisy activities are conducted at night, temporary noise impacts from the Pico/San Vicente Station component of this alternative would be less than significant.

Cut-and-cover construction activities to relocate a storm drain within Queen Anne Place between a point approximately 600 feet south of 12th Street and Pico Boulevard (approximately 1,000 feet) would create noise impacts as described above in Tables 7-44 and 7-45. The northern portion of this construction area fronts onto Queen Anne Recreation Center on the west side of the street and Queen Anne School on the east side. South of these two uses are residential units. The noise associated with this cut-and-cover activity would move every few days along the length of the construction area. This noise affect would end upon completion of the installation of the new storm drain. This construction activity is expected to last about two months.

Installation of grouting over the tunnels from the surface would also create noise impacts. Holes would be drilled from the surface and grout would be pumped through pipes into the ground (see Figure 4-2) to reduce the potential for settlement to occur along the path of the twin tunnels. It is not known where grouting from the surface would be required along the tunnel alignments, however, MTA experience with this construction activity indicates that when it is performed in close vicinity to residential uses that a short-term significant noise affect would occur.

Alternative B (Wilton/Arlington/Venice)

Construction noise concerns at Olympic/Arlington Station are the same as Alternative A.

The close proximity of residential development to Venice Boulevard, in both areas of proposed cut-and-cover construction and for the proposed station, would potentially impact a number of residents, particularly for any nighttime construction activities. Cut-and-cover tunnel excavation is seen in Table 7-45 to have a 315-foot noise impact zone at night, and 150 feet by day. A substantial number of first-tier residential structures closest to Venice Boulevard are within the zone of potential noise impact. As with Alternative A, elevated daytime Venice Boulevard traffic noise would mask some of the construction activity noise. Substantial nighttime construction activity would however, have a potentially significant impact.

Mitigation via temporary sound walls would be somewhat more difficult for Alternative B than for Alternative A due to the grade separation (change in the ground elevation) that exists between the proposed Venice/San Vicente Station and the residences on the south side of Venice Boulevard. A sound wall would not be able to mitigate the noise unless it was tall enough to act as a barrier between the construction activities and the upper story residential units.

Noise associated with grouting activities is the same as described for Alternative A.

Alternative C (Crenshaw/Pico)

Demolition of existing commercial buildings to create two construction staging areas that would eventually become station plazas for the Olympic/Crenshaw Station and subsequent station construction would have surrounding residences within its 150-foot noise "envelope." In the absence of mitigation, a temporary significant noise impact would occur. This potential impact would be exacerbated by the removal of structures along Crenshaw Boulevard that currently partially shield residences along Victoria and Bronson Avenues from traffic noise. Noise mitigation to re-establish a degree of noise protection and to reduce construction activity impact potential is strongly recommended.

Cut-and-cover within Crenshaw Boulevard between 8th Street and a point 1,100 feet south of Country Club Drive and within Pico Boulevard between Victoria Avenue and the Pico/San Vicente Station site would create noise impacts as described above in Tables 7-44 and 7-45. Since the construction sites would be in close proximity to residential areas east and west of Crenshaw Boulevard and north and south of Pico Boulevard, construction without noise abatement measures would cause considerable intrusion and annoyance. Without mitigation, this would be considered a significant impact. The distances given in Table 7-45 represent worst case assumptions. In practice there are many approaches to controlling community exposure to construction noise including careful layout of the construction site, curfews on construction activities to minimize nighttime noise, use of equipment with efficient mufflers, constructing noise barriers around the construction sites, and including specific noise limits into the construction contracts. These options are discussed in more detail below.

Cut-and-cover to relocate storm drains and sewer lines (as shown in Figures 7-38 and 7-39) would create noise impacts as described above in Tables 7-44 and 7-45. Noise would also be associated with the demolition of the 15 single-family, one multi-family building, and 3 commercial buildings. The noise associated with this cut-and-cover activity would move every few days along the length of the construction area as the utility lines would be installed. However, this noise affect would not end upon completion of the installation of the new utility lines. After the utility lines are installed the properties that had buildings removed would have additional noise impacts during the construction phase of new buildings. The construction activities associated with the relocation of utility lines for this alternative is expected to last about two years. The construction of new buildings would occur over an unknown period of time.

The construction noise impacts associated with the Pico/San Vicente Station are the same as described under Alternative A.

Noise associated with grouting activities is the same as described for Alternative A.

Construction Vibration Impact

Construction of prior tunneling projects in the Los Angeles area has generated perceptible and, in some cases, intrusive levels of ground-borne vibration at sensitive land uses. This experience indicates that construction vibration may be intrusive to occupants of buildings close to the construction site or tunnel.

However, it is unlikely that construction vibration would exceed any limits for building damage, including limits for minor cosmetic damage. This conclusion is reinforced by the limits on allowable vibration imposed upon contractors. System design criteria set the following vibration limits on MTA construction at 200 feet from the source within the low frequency (building shaking) range of 1 to 100 cycles/second (Hertz):

Sustained 1-Hour	not to exceed 80 VdB	(re: 10^{-6} in/sec)
Transient 1-Hour	not to exceed 90 VdB	(re: 10^{-6} in/sec)
Transient 10-Minutes	not to exceed 100 VdB	(re: 10^{-6} in/sec)

Activities that are expected to cause the highest levels of construction vibration include soldier pile placement, vibratory compaction, tunnel excavation, and operation of "muck" trains to remove excavated material. Pile driving would not be used for this project. Vibration may also result during horizonal drilling for tie-back placement. If tie-backs are used in proximity to residential uses, such as near the Olympic/Arlington or Olympic/Crenshaw Stations, geotechnical investigation would be required to determine if near-surface drilling can be performed without adverse vibration impact, or if cross-excavation bracing is a more appropriate retaining mechanism. Vibration limits in the construction documents would make it the contractor's responsibility to keep vibration below damage thresholds. These types of limits are usually sufficient to eliminate most potential for building damage from construction activities.

Experience with construction of the Northern Outfall Replacement Sewer (NORS), which was a bored tunnel running from the northern part of Culver City down to the Hyperion Treatment Plant, showed that both the tunnel boring machine and the muck trains used to move mined material from the tunnel face to the construction staging area ~~portal~~ can cause intrusive ground-borne vibration. Based on the experience with the NORS construction and measurements performed during construction of the Red Line tunnel under Wilshire Boulevard, vibration from tunneling and operation of "muck" trains is unlikely to exceed the threshold for building damage, but may be perceptible or annoying to building occupants up to approximately 100 feet from the working portions of the Mid-City Segment. This would be considered a significant impact. The actual levels of vibration seem to be strongly dependent on factors such as the equipment used by the contractor, the local geology, and type of buildings.

Tunneling would go under the following number of properties:

- Alternative A - 79 properties,
- Alternative B - 93 properties, and
- Alternative C - 52 properties

Vibration associated with construction activities at or above 95 VdB could potentially affect the historic resources described in section 7.16 (Historic Resources). Implementation of the proposed vibration mitigation measures would reduce vibration impacts on nearby historic properties to acceptable levels.

7.11.2.2 Operational Impacts

Methodology

Procedures for Projecting Air-borne Train Noise

The model used to project air-borne train noise is based on formulas given in the FTA Guidance Manual and the vehicle specifications used for purchase of the Red Line vehicles. The maximum wayside noise allowed in the specifications is 82 dBA for operation on tie-and-ballast tangent track at a distance of 50 feet from the track centerline and a height of 5 feet above the top of rail. A maximum sound level of 85 dBA has been used in the train noise calculations to allow for some sound level increase as a result of degradation of the wheel and rail surfaces under normal use.

Maximum noise levels from a train were used to generate a single event level (SEL) associated with each train passage. SELs from the busiest hour of train activity were used to create a peak hour Leq for any alternative with an above ground station. Twelve train passages were assumed to occur in the peak hour.

The effective 24-hour train noise exposure was calculated by assigning a +10 dB "penalty" to all train passages from 10:00 PM to 7:00 AM. This is functionally equivalent to assuming that each nighttime train passage counts as 10 events in calculating the 24-hour Ldn. Although there are fewer nighttime events, the substantial penalty to such train movements creates an effective daily average activity of 16+ passages per hour. The Ldn resulting from the 10 dB penalty creates levels that slightly exceed the peak hour Leq associated with 12 trains per hour.

For each above ground station alternative, the following equation describes the noise exposure at any distance [D] from the tracks:

$$\text{Ldn} = 65.8 + 10 \text{ X LOG } [\text{ D (ft)}^{\alpha}/50']$$

$$\text{Leq (max)} = 64.5 + 10 \text{ X LOG } [\text{ D (ft)}^{\alpha}/50']$$

For vegetated sites, $\alpha = 1.5$. For parking lots, paved areas or if source and receiver are grade-separated, $\alpha = 0$.

Because background noise levels near the proposed open air stations (Alternatives B1 and B2) are high, the amount of train noise that can be accommodated before a significant impact is created is also high. Unless there are circumstances where the removal of existing structures would eliminate the noise attenuation benefit of such buildings, thereby creating new direct transmission pathways for noise to travel through that are not currently present, the existing elevated noise baseline would minimize the potential for a significant noise impact from train movement.

In addition to the normal train noise, there would also be some noise from the train horns and occasional noise from track maintenance. Except for emergency warnings, the train horns would only be used just before the trains enter stations to make sure that passengers on the platform are clear of the train. Train horns are expected to be 10 dB higher (depending on the horn setting) than the noise of an operating train. Although the distinct character of the horns makes them audible over the train noise, on the low setting they are not loud enough to cause more than a marginal increase in noise exposure. Track maintenance, such as rail grinding, causes noise that would be audible in neighborhoods adjacent to the tracks. However, because the maintenance occurs on an infrequent basis, at most three or four times per year, it is not projected to influence the noise impact.

Trains pulling into a station often are accompanied by brake squeal from brake dust accumulation on its braking surfaces. Although brake squeal only minimally raises total noise exposure, its high-pitched squeal is annoying because of its unique frequency. Thus, even if noise standards were not violated, the braking noise, especially in proximity to people sleeping with open windows, could be perceived as a nuisance regardless of actual decibel levels. This affect would be particularly noticeable for the open air stations associated with Alternatives B1 and B2.

Procedures for Projecting Traffic Noise

Traffic volumes are projected to increase by 20 to 60 percent between 1995 and 2020 without construction of the Metro Red Line Mid-City Segment. The increase in noise is defined by the equation (adjust in the equation is the change from what is to what would be):

$$\text{Adjust} = 10 \log \frac{\text{speed}}{\text{50 mph}}$$

Changes in traffic noise levels were calculated based upon one reference calculation for a given set of traffic input conditions. Traffic noise levels for all scenarios on 37 roadway links were calculated using an adjustment for actual volumes and source-receiver distances. Because CNEL relative to the adopted significance criteria depend upon 24-hour average daily traffic (ADT), while the project traffic study calculated peak hour volumes in vehicles per hour (VPH), ADT were estimated as follows:

$$\text{ADT} \simeq 10 \text{ X VPH}$$

ADT was separated into various day/evening/night time periods and combined with observed percentages in light duty autos, medium duty trucks, and heavy duty trucks in the FHWA Highway Traffic Noise Prediction Model (FHWA-RD-77-108) using California-specific vehicle noise curves (CALVENO).

Procedures for Projecting Ground-borne Vibration and Noise

The process of projecting ground-borne vibration and noise from trains requires the following input: vibration source levels, ground transmission characteristics, and receiving building characteristics. The basic assumptions for the projections of ground-borne vibration and noise are that the train/track system can be represented by a force density that is independent of geology and that the vibration propagation can be characterized by a line source transfer mobility function that is independent of the train/track system. The basic equations used are given in the FTA Guidance Manual. The force density used for the projections has been based on test data with a number of light and heavy rail vehicles both at grade and in subway. Vibration propagation was based on the results of previous testing in the Los Angeles area, particularly a series of propagation tests that were preformed as part of a U.S. DOT sponsored study of ground-borne vibration. The U.S. DOT study included a test in proximity to Mid-City.

Projections based upon local area vibration measurements were somewhat lower than the FTA Guideline "default" value. The measurement data also do not take into account that there is some degradation in vibration isolation as track and equipment ages. There is further some uncertainty in site-specific vibration propagation characteristics created by localized sub-surface geologic variation. The curves used to predict surface vibration and ground-borne noise incorporate a safety factor that normally introduces sufficient conservatism to accommodate such variation.

Figure 7-33 shows the curves for projection of ground-borne vibration along the Mid-City Segment corridor that have been derived from the data discussed above. The degradation in vibration isolation was incorporated by using a propagation prediction that is mid-way between the "FTA Guidance Manual" and "Mid-City Red Line Projections" curves.

Diagonal distances were calculated using the vertical distance from top-of-rail to the surface and the horizontal distance from the nearest tunnel rail centerline to a point 10 feet inside any property line in the track vicinity. The diagonal distance was calculated using the standard Pythagorean Theorem. Speed effects were included in the calculation by incorporating an adjustment factor stated as:

$$\text{Adjust} = 20 \text{ X } \log \frac{\text{speed}}{50 \text{ mph}}$$

with an assumed acceleration/deceleration of 3 feet per second per second.

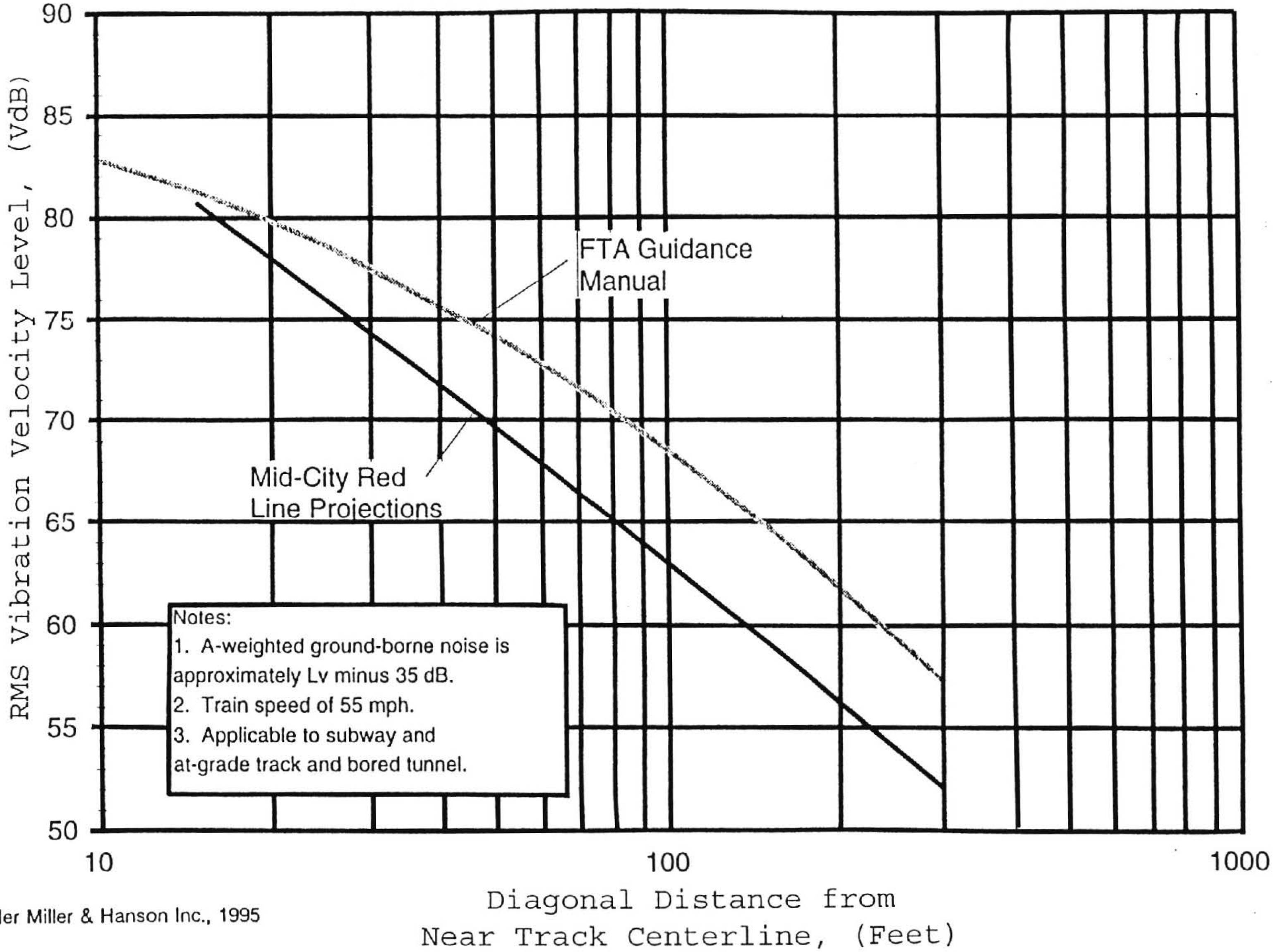
Air-borne Train Operation Noise

Alternative A (Wilton/Arlington/Pico)

This alternative has no aboveground track components, as such, there are no significant noise impacts.

Alternatives B1 and B2 (Wilton/Arlington/Venice)

The train would be visible for 500 feet from when it daylights at Station 497+00 (see figures in Appendix G) until it comes to a stop at mid-platform at Station 502+00. For an acceleration of 3 feet/sec/sec, it takes 20 seconds to reach 60 mph, or to slow from 60 mph to a stop. The train would thus already be slowing, or not yet at full speed when it reaches the tunnel daylight point.



Source: Harris Miller Miller & Hanson Inc., 1995

ULTRASYSTEMS ENVIRONMENTAL INCORPORATED

FIGURE 7-33
PROJECT GROUND-BORNE VIBRATION

The open air station walls and any track cover would act as noise propagation barriers. The effective noise level would be reduced by 10 dB or more by the partial enclosure. Brake squeal may be amplified by the echo effects from the partial enclosure. Existing and future at-grade structures, however, would block the line of sight from the station to the nearest residences. Train noise impacts would be less than significant.

As previously noted, baseline noise levels in the vicinity of Venice Boulevard near the proposed station are 70+ dBA Ldn. The FTA Guideline's establish a train noise significance threshold at 65 dBA Ldn for a Category 1 or 2 site. For the operational train scenario analyzed, train noise levels of 65 dBA extend no more than 60 feet from the track centerline. The nearest residences from the open air track segment are more than 60 feet from the track centerline. Train noise impact from this worst-case impact condition are less than significant relative to the adopted FTA Guidelines. Brake squeal and horn honking, however, would be audible at the nearest homes from inbound trains, and it would be disturbing to sleeping people. Although traffic noise is relatively loud, traffic noise is more steady-state and not high pitched like brake squeal. Humans become acclimated and sleep through steady lower-pitched "hums," but may be wakened by markedly intermittent high-pitched brake squeal and horn honking. Noise mitigation to re-establish a degree of noise protection and reduce intermittent high-pitched brake squeal and horn honking is strongly recommended.

Alternative C (Crenshaw/Pico)

This alternative has no aboveground track components, as such, there are no significant noise impacts.

Noise Impacts Associated with Traffic

Traffic noise levels were calculated for existing (1997) conditions and for future with and without project conditions for each alternative. Except for individual driveway turning movements at Pico/or Venice/San Vicente, Alternatives A and B would have identical areawide traffic patterns. Traffic noise levels (CNELs at 50 feet from the roadway centerline) for each scenario are shown in Table 7-46.

No Project Alternative

Any measurable changes (+1 dBA or more) are attributable exclusively to continued land use intensification of the Mid-City area under the no project alternative. Project-related traffic noise level changes are inconsequential.

Alternative A (Wilton/Arlington/Pico)

Maximum increases in traffic noise compared to the no-project alternative are +0.2 dBA CNEL. Such changes are well below the +1 dBA CNEL increase needed to support a finding of a significant impact.

Table 7-46
Traffic Noise Impact Analysis (Year 2020)
(CNEL in dBA at 50 feet from roadway centerline)

Location	Existing	Future		
		No Project	Alternatives A and B	Alternative C
Wilshire Boulevard				
West of Crenshaw Bl.	70.4	71.2	71.2	71.2
Crenshaw Bl. - Wilton Place	69.2	70.5	70.5	70.5
Wilton Place - Western Ave.	68.4	69.8	69.8	69.8
East of Western Ave.	68.9	69.6	69.6	69.6
Olympic Boulevard				
West of Crenshaw Bl.	69.9	71.0	71.1	71.2
Crenshaw Bl. - Wilton Place	70.3	71.8	71.8	71.8
Wilton Place - Western Ave.	70.2	72.3	72.3	72.3
East of Western Ave.	69.9	72.4	72.4	72.4
Pico Boulevard				
West of La Brea Ave.	68.4	69.1	69.3	69.3
La Brea Ave. - San Vicente Bl.	68.1	68.9	69.1	69.0
San Vicente Bl. - Crenshaw Bl.	68.7	69.7	69.9	69.9
Crenshaw Bl. - Arlington Ave.	67.8	69.2	69.3	69.3
Arlington Ave. - Western Ave.	67.3	69.1	69.1	69.1
East of Western Ave.	66.7	68.7	68.7	68.7
Venice Boulevard				
West of La Brea Ave.	69.4	69.7	69.7	69.7
La Brea Ave. - San Vicente Bl.	68.5	69.7	69.7	69.7
San Vicente Bl. - Crenshaw Bl.	70.4	72.7	72.7	72.7
East of Crenshaw Bl.	69.5	71.9	71.8	71.8

Table 7-46
Traffic Noise Impact Analysis (Year 2020)
(CNEL in dBA at 50 feet from roadway centerline)

Location	Existing	Future		
		No Project	Alternatives A and B	Alternative C
San Vicente Boulevard				
NW of La Brea Ave.	68.9	69.0	69.1	69.1
La Brea Ave. - Pico Bl.	68.3	68.6	68.8	68.8
Pico Bl. - Venice Bl.	67.4	69.1	69.2	69.2
La Brea Avenue				
N of San Vicente Bl.	72.2	72.5	72.6	72.6
San Vicente Bl. - Pico Bl.	72.2	72.6	72.6	72.6
Pico Bl. - Venice Bl.	72.4	72.6	72.7	72.7
S of Venice Bl.	72.2	72.6	72.5	72.5
Crenshaw Boulevard				
Wilshire Bl. - Olympic Bl.	68.8	69.5	69.5	69.6
Olympic Bl. - Pico Bl.	69.5	70.3	70.4	70.4
Pico Bl. - Venice Bl.	70.1	70.8	70.8	70.8
S of Venice Bl.	70.8	71.6	71.6	71.6
Wilton Place/Arlington Avenue				
N of Wilshire Bl.	68.7	69.9	69.9	69.9
Wilshire Bl. - Olympic Bl.	68.7	69.8	69.9	69.8
Olympic Bl. - Pico Bl.	68.5	69.6	69.7	69.7
S of Pico Bl.	67.9	69.0	69.0	69.0
Western Avenue				
N of Wilshire Bl.	69.0	69.9	69.9	69.9
Wilshire Bl. - Olympic Bl.	69.6	70.0	70.0	70.0
Olympic Bl. - Pico Bl.	68.5	70.1	70.1	70.1
S of Pico Bl.	68.7	69.8	69.8	69.8

Source: FHWA-RD-77-108 (Calveno Mod.)

While the project would be expected to reduce traffic overall, some local routes may experience slightly augmented traffic volumes. The route projected to receive the greatest increase in traffic for all ~~four~~ "build" alternatives is along Vineyard Avenue south of Venice Boulevard. Here the project could raise the traffic level by as much as 23 percent. The next greatest increase is along Muirfield Road north of Pico Boulevard where project implementation could raise traffic volumes by as much as 8 percent. For an increase of 23 percent, the change in noise is 0.9 dBA and would not be audible or significant. An 8 percent increase in traffic would raise the noise level by 0.3 dBA. Other access routes would have even lesser increases.

The only perceptible change in traffic noise would occur at the rear lot line of several homes on Arlington Avenue and Westchester Place that are currently protected from Arlington Avenue traffic noise by existing homes. When these homes are removed to create a station plaza for the Olympic/Arlington Station, they would cease to act as a noise barrier. Plaza human activity (shouting, loud radios, etc.) may also be audible at the nearest residences.

Alternative B (Wilton/Arlington/Venice)

The effect is the same as that described for Alternative A above.

Alternative C (Crenshaw/Pico)

The combination of utility relocation and construction of a station plaza would require removal of several buildings on both the northeast and southwest corners of the Crenshaw/Olympic intersection. The buildings that would be removed on the southwest corner include a gas station and two single story structures. Removal of these buildings is not expected to cause more than a marginal change in the noise exposure for any adjacent land uses. The buildings that would be removed on the northeast corner are estimated to currently provided 8 dBA of shielding for the two residences on Bronson Avenue. Existing noise exposure is estimated to be at an Ldn of 57 dBA. Exposure to this level of noise would not create a significant impact on these residences.

Ground-borne Noise and Vibration Impacts

The vibration impact significance standard for sensitive uses is 72 VdB (re: 10^{-6} in/sec) for vibration and 35 dBA for ground-borne noise. However, as per Harris Miller Miller & Hanson, 1995, and the FTA impact criteria previously discussed, it was assumed that vibration is 35 VdB higher than ground-borne noise. A vibration level of 70 VdB (re: 10^{-6} in/sec) is thus equivalent to the 35 dBA ground-borne noise significance standard.

Except for the speed correction, vibration was seen in Figure 7-33 to be approximately "log-linearly proportional" (foreshortened) to the slant distance (D) from the top-of-rail (TOR) to the ground elevation. This can be expressed as follows:

$$\text{Vibration} = a \log (D) + b$$

Solving for the curve used in the vibration analysis, a vibration level of 70 VdB occurs for a slant distance of 49 feet or less for residential use. Highly sensitive vibration/ground-borne noise land uses have a significance standard of 25 dBA for ground-borne noise. In the above expression, the zone of vibration and/or ground-borne noise is 205 feet. Any sensitive uses within a slant distance of 49 feet of TOR, or within 205 feet of TOR for ultra-sensitive uses, would experience a significant impact.

The number of parcels along the proposed alignments who meet the above standard at 10 feet from the edge of their property line are shown in Table 7-47. Because Crenshaw Boulevard has a wider right-of-way and is fronted mainly by commercial uses, fewer sites would likely experience potentially significant vibration impacts for Alternative C.

Table 7-47
Vibration/Ground-borne Noise Impact Summary

Land Uses	Sites Impacted		
	Alternative A	Alternative B	Alternative C
Residences	31	38	16
Commercial Uses	0	0	1
Church	1	1	0
Special Uses			
1. TV/Recording Studios	2	1	0
2. Acupuncturists	2	2	0
Total	36	42	17

Note: Alternative C impacts were calculated with greater information on foundation structure. The Alternative A and/or B analysis used conservative default averages that may require additional analysis to better isolate truly significant impacts.

Alternative A (Wilton/Arlington/Pico)

Almost all impacted sites occur along the "cross-country" transition from Wilshire Boulevard to Wilton Place where the tunnel alignment is directly under approximately 52 properties ~~numerous residences~~ with a tunnel depth of slightly less than 30 feet. A second group of potentially affected units occurs when the tunnel alignment leaves the Wilton Place right-of-way just before trains slow for the Olympic/Arlington Station. On the link between the Olympic/Arlington and Pico/San Vicente Stations, the tunnel depth drops rapidly. Although higher train speeds would occur west of the Olympic/Arlington Station, the alignment is too deep to affect sensitive uses along this segment. Except for one possible recording studio on Pico Boulevard, all vibration and/or ground-borne noise impacts occur between the Wilshire/Western and Olympic/Arlington Stations.

As a worst case scenario, impact significance has been evaluated assuming a vibration-free baseline condition. With buses and trucks traveling on Wilton Place, baseline levels may already exceed significance thresholds. Like increases in noise, an impact's significance is dependent on the background levels. Thus, an adjusted significance threshold based on an increase over existing conditions would generally apply to such situations. Some identified potentially significant impacts may become less than significant when pre-construction geotechnical investigations establish the pre-project baseline that currently actually exists within representative structures along the alignment.

Alternative B1 (Wilton/Arlington/Venice - **Lower Elevation Station at Venice/San Vicente)**

This alternative would experience almost all the same vibration impacts as Alternative A except for near the Venice/San Vicente Station where the track daylights. Since the Venice/San Vicente Lower Elevation Station is a terminus station trains would be traveling at very low speeds within the open air portion of the tracks. The low speeds would reduce the vibration impacts to levels that would not be perceivable to local residents.

Alternative B2 (Wilton/Arlington/Venice - **Higher Elevation Station at Venice/San Vicente)**

At the Venice/San Vicente Station site, Alternative B2 would have a finished elevation that is approximately 15 feet higher than Alternative B1. In addition, the 500 feet of tail tracks would be on support columns beginning immediately west of the station. The vibration effects of this station layout is the same as described for Alternative B1.

Alternative C (Crenshaw/Pico)

This alternative would experience almost all the same vibration impacts as Alternative A.

Almost all impacted sites occur along the "cross-country" transition from Wilshire to Crenshaw Boulevards where the tunnel alignment is directly under numerous residences with a tunnel depth of slightly less than 50 feet. A second group of potentially affected units occurs when the tunnel alignment turns in a westerly direction from Crenshaw Boulevard under residences to align with Pico Boulevard. On the link between the Olympic/Crenshaw and Pico/San Vicente Stations, the tunnel depth drops rapidly. Although higher train speeds would occur south and west of the Olympic/Crenshaw Station, the alignment is too deep to affect sensitive uses along this segment. All vibration and/or ground-borne noise impacts occur between the Wilshire/Western and Olympic/Crenshaw Stations.

Stationary Noise Sources

Alternative A (Wilton/Arlington/Pico)

No air ventilation structures would be constructed in this alternative alignment.

Alternative B (Wilton/Arlington/Venice)

No air ventilation structures would be constructed in this alternative alignment.

Alternative C (Crenshaw/Pico)

One ventilation shaft would be built on the southwest corner of Wilshire Boulevard and Norton Avenue mid-way between the existing Wilshire/Western Station and the Olympic/Crenshaw Station, and a second ventilation shaft would be built on the northwest corner of Pico Boulevard and Victoria Avenue between the Olympic/Crenshaw Station and the Pico/San Vicente Station. Potential noise impacts include train noise radiated out the tunnel, noise from fans used for forced ventilation of the tunnel, and the loss of any acoustical shielding that is provided by the building that would be removed for the vent structure. The vent structures would have a footprint of approximately 10 by 20 feet and be up to 15 feet high.

MTA uses the noise limits based on the design guidelines of the American Public Transit Association to specify the maximum allowable sound levels from fan and vent shafts. The noise limits for "Average-Density Residential" communities are 55 dBA for train noise radiated out of a vent shaft and 45 dBA for noise from a fan shaft. These noise limits are applicable at 50 feet from the shaft outlet or at the setback line of the nearest building or occupied area, which ever is closer.

The City of Los Angeles Municipal Noise Ordinance similarly prohibits generation of noise by mechanical equipment that may annoy any nearby noise-sensitive uses. The City standard, stated in Section 112.04(b) of the Municipal Code, prohibits operation of any mechanical device that increases noise levels at any residential property by more than +5 decibels above ambient. Because ambient noise levels along those portions of any alignment within arterial rights-of-way are above 60 dBA even during quiet periods, meeting the MTA standard would ensure that City standards are met as long as ventilation structures are built in elevated noise baseline environments.

Achieving the MTA noise limits requires careful consideration of how train and fan noise would attenuate as they propagate from the noise source through the vent/fan shaft to the shaft opening. Typical noise control treatments include lining the shaft with acoustical absorption material and installing silencers in the shaft or on the exhaust side of the fans. The need for noise control treatments is determined during the final design phase of the project after the shaft has been designed and the types of fans selected. MTA has used this procedure to successfully mitigate noise from ventilation structures in existing segments of the Red Line.

In addition, because existing structures at the vent structure sites provide only marginal acoustical shielding for noise sensitive receivers, removing the structures would not cause significant changes in noise exposure to surrounding communities.

7.11.3 Cumulative Impacts

7.11.3.1 Construction Impacts

No major construction projects are planned to occur adjacent to and simultaneous with construction of the Metro Red Line Mid-City Segment. The Metro Red Line Western Extension and the Crenshaw-Prairie Line are potential transit lines that would begin or end at the Pico/ or Venice/San Vicente site. Construction of these projects are anticipated to occur after completion of the Metro Red Line Mid-City Segment. The area around the San Vicente Station would be subject to noise impacts for a second duration when the additional transit lines are constructed at the site.

7.11.3.2 Operational Impacts

Potential cumulative impacts may derive from the proposed project along with the effects of general growth and/or specific transit extensions planned for the Pico/or Venice/San Vicente site. It is necessary to use both of these approaches in order to reasonably analyze the proposed project's cumulative impacts. Growth projections indicate overall increases in noise levels anticipated for the community in general; however, because specific transit projects are currently planned for the Pico/ or Venice/San Vicente site, future noise increases at that site in particular may be greater than the overall increases anticipated for the community in general.

- *Red Line Western Extension*: The Western Extension would continue westward from the Pico/ or Venice/San Vicente Station. Since the extension would not change design year train operations ~~or ridership~~ at San Vicente, it would not affect noise or vibration along the Mid-City Segment. The only potential cumulative noise impact would be from increased bus or automobile traffic to the Pico/San Vicente station site. Since the streets that this would effect already carry a high volume of traffic, the percent change in traffic volume is expected to be small enough that the change in noise exposure would be insignificant. An aerial westward departure may create noise/vibration impacts at sensitive receivers along the potential San Vicente Boulevard extension. All other potential westward extensions exiting the terminus station would be underground within the Pico Boulevard right-of-way. Impacts and mitigation at newly affected locations would be analyzed in environmental documentation specific to the Western Extension.

- *Crenshaw/Prairie Line*: The Crenshaw/Prairie Line proposes to have one terminus at the Venice/ San Vicente Station site. This could cause an increase in the general activity and the level of traffic near the Venice/San Vicente Station. Because of the high volumes of existing traffic and the distances to noise-sensitive receptors, no cumulative noise impacts are likely.

- *General Growth*: General traffic volume growth is expected to cause community noise exposure to increase by approximately 1 decibel regardless of whether the Metro Red Line Mid-City Segment is constructed. Changes of +1 dBA, especially when they occur over an extended period of time, are imperceptible to people under ambient conditions. The Mid-City area is sufficiently built out such that any traffic noise changes from limited additional land use intensification would be completely masked by the already elevated existing noise baseline.

7.11.4 Mitigation Measures

Construction Mitigation Measures

Without mitigation, construction noise and vibration would be likely to cause extensive short-term construction noise and vibration impacts. The impacts are referred to as short-term because they are not permanent (that is they would eventually stop), however, the construction activities would continue for a number of years. The FTA Guidance Manual recommends general approaches for controlling construction noise and vibration. Of these approaches, the following are most applicable to this project:

Noise and Vibration Specifications

1. MTA will include in all construction contract documents noise and vibration performance standards. MTA will use noise pollution control specifications developed for its construction contracts consistent with the newest FTA requirements. Noise specifications will include noise limits for individual pieces of equipment, and/or thresholds for acceptable levels at nearby noise-sensitive land uses. MTA vibration specifications will specify limits for damage and/or annoyance at sensitive land uses. The MTA specifications will require the contractor to monitor noise and vibration levels to demonstrate compliance with the specifications.

2. As part of the preparation for construction, during final design of the LPA, the MTA will conduct a survey of sensitive structures. It is recommended that vibration monitoring equipment be installed near sensitive uses to ensure that during construction activity, vibration remains well below the 95 VdB threshold for damage to fragile historic buildings. MTA will fit sensitive structures with geotechnical instrumentation and maintain monitoring during construction. If required, grouting will also be used to minimize the potential for soil settlement around the tunneling. (Same as mitigation measure #4 in section 7-16.)

3. The MTA will purchase two additional structures immediately south of the five structures that will be purchased for the construction staging area for the Olympic/Arlington Station; one on Arlington Avenue and one on Westchester Place. This structures will be retained for use as construction offices. Retaining these two structures will provide a buffer zone between the construction staging area and the residential neighborhood to the south. The two structures in the buffer zone will help dampen noise from the construction staging area.

Operational Restrictions

4. MTA's contractors will carefully schedule noisy activities to minimize noise and vibration impacts. Wherever feasible, noisier activities will be performed during daytime hours in residential areas, while avoiding daytime activities near schools or day care centers. The current City of Los Angeles noise ordinance has severe limits on nighttime construction noise. The effect of these limits are to basically prohibit nighttime construction near residential areas. Certain Metro Rail activities are exempt from the ordinance. Such exemption notwithstanding, time limits will be

imposed on the contractors as environmental clearance conditions regardless of whether they are not required by ordinance.

Site Design

5. Within all construction staging areas, noisy equipment will be kept as far as possible from sensitive land uses by MTA's contractors. It may be possible to arrange the site to provide acoustic shielding from noisier activities at nearby sensitive land uses. Truck routes to and from the site will be arranged by the contractor to minimize passing near sensitive land uses.

6. Muck hauling vibration impacts can be mitigated by modification to the temporary rail-bed, or by limiting hauling hours to less sensitive time periods.

Temporary Sound Barriers or Enclosures

7. Depending upon the configuration of the site and location of nearby sensitive land uses, if possible MTA will require contractors to provide temporary noise barriers to reduce construction noise levels. MTA's contractors will provide enclosures for stationary equipment (such as compressors or generators) if they ~~found to~~ generate noise complaints~~-annoyance~~. MTA's contractors will provide noise barriers ~~that are 12 to 20 feet high~~ around any of the construction sites where they are needed to avoid intrusive noise in residential communities. In particular, contractors will provide a noise barrier to separate the Olympic/Arlington or Olympic/Crenshaw construction and staging areas from the nearest residences. With primarily one-story receiver locations, temporary barrier heights of 10 feet may be adequate. Multiple-story receiver heights may require taller barriers. MTA's contractors will provide finalized barrier location/design based on required knowledge of specific locations for cranes and other noise sources to be developed in subsequent construction planning.

Community Liaison

8. An MTA community liaison staff person will be used to help inform residents of the schedule and extent of planned construction activities and can help work with community members to find the least intrusive times for certain construction activities. Warning residents of unavoidably noisy activities can help them plan around the intrusion.

Potential Temporary Relocation

9. ~~As a last resort measure~~ In the event that construction-related noise or vibration levels cannot be sufficiently reduced, it may be necessary for the MTA to give the affected residents and businesses the option of being temporarily relocated until intrusive construction activities have been completed. Treatments to individual homes, such as double-pane windows, would also be considered on a case-by-case basis, if warranted.

Operational Mitigation Measures

Train Noise/Vibration

Alternatives A and B (Wilton/Arlington)

Noise from Train Operations

10. An 8-10 foot concrete/masonry wall, along with sound absorbing ~~graffiti-reducing~~ landscaping will be constructed to separate the homes abutting the south side of the Olympic/Arlington Station entrance from traffic noise and plaza activities.

All Alternatives

Ground-borne Noise and Vibration

11. Relatively standard mitigation measures will be sufficient to eliminate impacts of only a few dB. It is recommended that MTA require resiliently supported ties or plinth pads and bonded rubber pads be used in the areas where mitigation is required. MTA staff will supply to the engineers/ designers measurement data from operating sections of the Red Line for use in refining the vibration control requirements and optimize the mitigation design. With proper selection of the vibration control measures, it is possible to eliminate the projected vibration impacts.

    The resiliently supported tie system consists of concrete ties supported by rubber pads. The rails are fastened directly to the concrete ties using standard rail clips. Underground rails are also supported on concrete plinth pads which run parallel to the rail. The metal fastener which connects the rail to the plinth pad incorporates bonded rubber pads to dampen noise and vibration. Existing measurements data suggests that resiliently supported ties can be very effective in reducing low-frequency vibration in the 15 to 40 Hz range. This makes them particularly appropriate for transit systems with vibration problems in the 20 to 30 Hz range. With appropriate stiffness pads, this approach will be able to eliminate potential impacts of the project except for the TV studio and possibly the acupuncture offices.

The location where mitigation is required to eliminate potential ground-borne vibration impacts for Alternative A would be from Civil Station 384+50 (Ingraham Street) to 414+50 (Olympic Boulevard) (as shown on Figure 2-1), or a 3,000 foot segment.

Alternatives A and B (Wilton/Arlington)

The television studio has several mitigation options, including the following in order of complexity and cost:

12. Use of a floating slab trackbed for the segment underneath the studio.

13. Construction of a noise- and vibration-isolated studio through a box-within-a-box construction.

14. Determination that existing truck traffic on Olympic Boulevard already causes vibration to exceed 65 VdB (re: 10^{-6} in/sec) or ground-borne noise to exceed 25 VdB, thus reducing or eliminating the need for mitigation.

15. Relocation of the facility.

    Acupuncture has been treated in other Red Line studies as a normal medical facility not affected by vibration levels which humans can generally not even feel (i.e., $\leq$70 VdB). The baseline vibration level may already exceed this threshold during individual events.

16. Baseline vibration monitoring will be conducted by the MTA prior to preliminary design, and the necessity to mitigate to undetectable vibration levels will be established before mitigation for these uses is finalized.

17. MTA staff will determine if a recording studio exists at 4365 Pico Boulevard, based on the name of "Intersound Productions" on the door. If it is a recording studio, MTA will include mitigation measures, such as those described for the TV station.

Alternative B (Wilton/Arlington/Venice)

Air-borne Noise

18. A 6-foot solid wall along the southern track boundary extending from Station 496+50 (immediately west of West Boulevard) to Station 500+00 (the beginning of the Venice/San Vicente Station) (as shown on Figure 2-4) will be required to screen wheel noise from both the inbound stopping and possibly outbound accelerating trains from the nearest residences with back or side yard exposure to Venice Boulevard and the Red Line track.

19. The MTA will set the train's horn to sound at the minimum safe level while in the vicinity of the Venice/San Vicente Station and/or explore other options for alerting passengers that a train is approaching.

20. MTA will monitor existing noise levels immediately before construction begins, and quarterly thereafter to ensure train noise exposure remains below significance threshold levels. The MTA will implement additional mitigation as required to meet standards.

Ground-borne Noise and Vibration

21. MTA will require the engineer/designer to include track modifications within the cut-and-cover segment between Civil Station 480+00 (Victoria Avenue) to 495+00 (West Boulevard) (as shown on Figure 2-4) through the use of resiliently supported ties or plinth pads and bonded rubber pads to reduce impacts to less than significant levels.

Alternative C (Crenshaw/Pico)

Air-borne Noise

22. In those areas where there are multi-story buildings adjacent to the Olympic/Crenshaw Station, MTA will require that physical barriers be erected for noise protection that are high enough to break the source-receiver line of sight. An 8-10 foot concrete/masonry wall, along with sound absorbing ~~graffiti-reducing~~ landscaping will be constructed to separate the homes abutting the Olympic/Crenshaw Station from traffic noise and plaza activities.

Noise Impacts from Ventilation Structures

23. MTA will require that ventilation equipment and structures be tested and certified to meet MTA noise performance standards.

Ground-borne Noise and Vibration

24. MTA will require the engineer/designer to include track modifications from Civil Station 395+50 (Norton Avenue/Wilshire Boulevard) to 408+50 (Crenshaw Boulevard/8th Street) (1,300 feet, as shown on Figure 2-7) and from Station 445+00 (Crenshaw Boulevard) to 460+00 (Pico Boulevard) (1,500 feet, as shown on Figure 2-7) to reduce operational vibration impacts to less than significant levels.

Ground-borne Noise and Vibration (All Alternatives)

25. The MTA will conduct a survey of sensitive structures, and install vibration monitoring equipment near sensitive uses to ensure that during construction activity, vibration remains well below the 95 dBV threshold for damage to fragile historic buildings. MTA will fit sensitive structures with geotechnical instrumentation and maintain monitoring during construction.

Traffic Noise Impacts (All Alternatives)

26. MTA will require the engineer/designer to include a wall 8-10 feet high adjacent to newly exposed one-story unit receivers . For a two-story receiver, a wall height of 15 feet will be necessary to protect upstairs noise-sensitive uses.

7.11.5 Unavoidable Significant Adverse Impacts

Implementation of the mitigation measures will reduce all noise and vibration impacts to less than significant levels.

7.12 AIR QUALITY/ODOR

7.12.1 Environmental Setting

Climate and Meteorology

Regional Climate

The North Pacific high-pressure cell is the dominant climatic influence over the eastern North Pacific Ocean, particularly during the summer. The high-pressure cell produces a predominantly northwesterly flow of maritime air over the California coastal waters. During winter, the Pacific High weakens and moves south, resulting in weaker and less persistent northwesterly winds along the California coast than in the warmer half of the year.

As the air mass approaches the coast of California, this large scale circulation pattern is modified by local influences. The differential heating between the desert and the adjacent Pacific Ocean modifies the predominant flow, enhancing it during the warmer half of the year and weakening it during the colder portion. On a local and sub-regional basis, the air flow in California is channeled by its mountain ranges and valley. The coastal mountain ranges limit the flow of maritime air into the interior of California. This transition from a cool and damp marine environment to a dry and warm continental climate therefore occurs over a fairly short distance.

South Coast Air Basin

The South Coast Air Basin (SCAB) is a 6,600 square mile coastal plain bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto mountains to the north and east. The SCAB includes all of Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino Counties. Basinwide conditions are characterized by warm summers, mild winters, infrequent rainfall, moderate onshore daytime breezes, and moderate humidities.

All seasons generally exhibit onshore flows during the day and offshore flows at night, after the land cools below the temperature of the ocean. The likelihood of strong offshore flows, including Santa Ana winds, is greater during winter than during summer (California Air Resources Board [CARB] 1984).

The topography and climate of southern California combine to produce generally poor air quality in the Air Basin. The combination of low temperature inversion; meteorological conditions such as light winds, shallow vertical mixing, and extensive sunlight; and topographical features such as adjacent mountain ranges hinder dispersion of air pollutants, thus contributing to poor air quality, especially in inland valleys of the basin.

Local Meteorology

In the Mid-City area, winds blow primarily from the southwest (24%) and south (19%), with lower frequencies for adjacent wind sectors (about 11% for west and for southeast, and about 10% for east), and still lower frequencies for opposing wind sectors (7% for northwest, 8% for northeast, and 9% for north). The strongest winds are from the south-southwest [7.1 miles per hour (mph), annual average] and west-southwest (6.6 mph) and the lightest winds are from the northeast (2.3 miles per hour).[1]

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[1]/ Meteorological data are taken from California Department of Water Resources, 1978, Winds in California, Pico/Fairfax SCAQMD Monitoring Station, 1955-71.

Existing Air Quality

Air Pollutant Emissions

Criteria Air Pollutants. The most recent comprehensive air pollutant emissions inventory for the SCAB was prepared for 1993. In 1993, about 7,000 tons per day (TPD) of carbon monoxide (CO); 1,240 TPD of volatile organic compounds (VOC); 1,200 TPD of nitrogen oxides (NO_x); 80 TPD of sulfur oxides (SO_x); and 420 TPD of respirable particulates (PM_{10}) were emitted in SCAB [SCAQMD and Southern California Association of Governments (SCAG) 1996]. About 78% of the CO, about 64% of the NO_x, 31% of the SO_x, and about 50% of the VOC were emitted by vehicular sources. About 60% of all PM_{10} is due to on-road mobile sources, with 53% due to resuspended roadway dust and 7 percent of PM_{10} due to vehicular exhaust. Past studies have shown relatively little seasonal variation in air pollutant emissions. Seasonal variations in meteorology, however, result in marked seasonal differences in atmospheric concentrations of pollutants (SCAQMD and SCAG 1991).

Toxic Air Contaminants. Substantial concentrations of toxic air contaminants (TACs), both carcinogenic and non-carcinogenic, exist in urban areas as a result of emissions from mobile sources such as motor vehicles and aircraft, and stationary sources such as gasoline service stations, automotive repair shops, dry cleaners, various types of manufacturing, and large industrial operations. According to SCAQMD (1988), 1984 emissions of 20 major TAC in SCAB totaled about 9,400 tons. No more recent inventory has been compiled. With numerous TAC emissions control programs implemented within the last decade, current TAC emission levels are likely considerably reduced.

Ambient Air Pollution Concentrations

South Coast Air Quality Management District Monitoring. SCAQMD operates a regional air quality monitoring network that provides information on average concentrations of those air pollutants for which state or federal agencies have established ambient air quality standards. Tables 7-48 and 7-49 are five year summaries of monitoring data for the major air pollutants, collected at SCAQMD's Central Los Angeles and West Los Angeles monitoring stations. These two stations are the nearest monitoring stations to the project alignment and, among SCAQMD's current stations, are the ones most representative of air quality conditions in the project area. Over the last 15 years, air quality in the SCAB has improved substantially. Exceedances of the State and national standards for lead have been completely eliminated. The State and national SO_x standards were met throughout the period. Second-stage smog alerts have disappeared and the number of first-stage alerts has dropped dramatically. Smog episodes are defined in Table 7-49.1. The federal annual standard for nitrogen dioxide (NO_2) is now met almost every year as is the one-hour CO standard. The likelihood of meeting the federal 8-hour CO standard is a realistic expectation in the not-too-distant future. No significant trend can be seen over the limited period for which respirable particulates (PM_{10}) have been monitored.

Criteria Air Pollutants

Ozone. Ozone (O_3) is not emitted directly by any major stationary or mobile air pollutant sources in SCAB. It is a "secondary" air pollutant formed in the atmosphere through a complex series of photochemical reactions involving hydrocarbons and NO_x, primarily nitrogen dioxide. Substantial O_3 formation generally requires a stable atmosphere with strong sunlight.

O_3 is considered a pollutant of regional rather than local concern. Significant progress has been made over the past decade in reducing O_3 concentrations in the SCAB, but O_3 concentrations in the SCAB still exceed the national standards far more frequently than in any other area of the U.S.

Table 7-48
Central Los Angeles Ambient Air Monitoring Data Summary - 1991-1995

Pollutant	Measurements, Averaging Period, and Units of Measure[a]	Federal Standard[b]		California Standard[c]	Station Data by Year[d]				
		Primary	Secondary		1992	1993	1994	1995	1996
Ozone	Highest 1-hour average, ppm	0.12	0.12	0.09[e,f]	0.20	0.16	0.19	0.17	0.14
	No. of excesses of standard (Fed./St.)				23/57	8/34	14/19	5/38	4/24
Carbon Monoxide	Highest 1-hour average, ppm	35	35	20[e]	12	9	11	10	10
	No. of excesses of standard				0	0	0	0	0
	Highest 8-hour average, ppm	9	9	9[e]	9.5	6.8	8.6	8.4	8.4
	No. of excesses of standard				0	0	0	0	0
Nitrogen Dioxide	Highest 1-hour average, ppm	NS	NS	0.25[e]	0.28	0.21	0.22	0.24	0.25
	No. of excesses of standard				1	0	0	0	0
Sulfur Dioxide	Highest 24-hour average, ppm	0.14	NS	0.04[e,g]	0.010	0.007	0.011	0.010	0.010
	No. of excesses of standard				0	0	0	0	0
Suspended Particulates (PM_{10})[h]	Highest 24-hour average, $\mu g/m^3$	150	150	50	137	104	122	141	138
	No. of excesses of standard[i]				1/57 - 31/57	0/61 - 22/61	0/61 - 26/61	0/60 - 14/60	0/60 - 11/60

a. ppm = parts per million; $\mu g/m^3$ = micrograms per cubic meter.
b. National Primary Standards are the levels of air quality necessary to protect the public health with an adequate margin of safety. National Secondary Standards are the levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant. NS = no standard.
c. Standards are expressed in the same units as the measurement; California standards are uniformly more stringent than the corresponding national standards.
d. NA = not available; NM = not monitored.
e. These standards are not to be exceeded.
f. The California ozone standard, 1-hour average, was changed from 0.10 ppm to 0.09 ppm beginning in 1988.
g. The California sulfur dioxide standard, 24-hour average, was changed from 0.05 ppm to 0.04 ppm beginning in 1991.
h. PM_{10} samples collected every six days.
I. Entries shown as ratios = samples exceeding standard/samples taken (Federal exceedances/samples - State exceedances/samples)
Source: South Coast Air Quality Management District, 1991-1995 Air Quality Data Sheets.

Table 7-49
West Los Angeles Ambient Air Monitoring Data Summary - 1991-1995

Pollutant	Measurements, Averaging Period, and Units of Measure[a]	Federal Standard[b]		California Standard[c]	Station Data by Year[d]				
		Primary	Secondary		1992	1993	1994	1995	1996
Ozone	Highest 1-hour average, ppm	0.12	0.12	0.09[e,f]	0.17	0.18	0.16	0.14	0.14
	No. of excesses of standard (Fed./St.)				12/45	7/23	2/15	1/19	1/13
Carbon Monoxide	Highest 1-hour average, ppm	35	35	20[e]	11	9	9	8	7
	No. of excesses of standard				0	0	0	0	0
	Highest 8-hour average, ppm	9	9	9[e]	5.9	5.4	6.0	5.6	4.5
	No. of excesses of standard				0	0	0	0	0
Nitrogen Dioxide	Highest 1-hour average, ppm	NS	NS	0.25[e]	0.30	0.17	0.16	0.20	0.18
	No. of excesses of standard				1	0	0	0	0
Sulfur Dioxide	Highest 24-hour average, ppm	0.14	NS	0.04[e,g]	NM	NM	NM	NM	NM
	No. of excesses of standard				NA	NA	NA	NA	NA
Suspended Particulates (PM_{10})[h]	Highest 24-hour average, $\mu g/m^3$	150	150	50	NM	NM	NM	NM	NM
	No. of excesses of standard				NA	NA	NA	NA	NA

a. ppm = parts per million; $\mu g/m^3$ = micrograms per cubic meter.
b. National Primary Standards are the levels of air quality necessary to protect the public health with an adequate margin of safety. National Secondary Standards are the levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant. NS = no standard.
c. Standards are expressed in the same units as the measurement; California standards are uniformly more stringent than the corresponding national standards.
d. NA = not available; NM = not monitored.
e. These standards are not to be exceeded.
f. The California ozone standard, 1-hour average, was changed from 0.10 ppm to 0.09 ppm beginning in 1988.
g. The California sulfur dioxide standard, 24-hour average, was changed from 0.05 ppm to 0.04 ppm beginning in 1991.
h. TSP samples collected every six days.
Source: South Coast Air Quality Management District, 1991-1995 Air Quality Data Sheets.

Table 7-49.1
Smog Episodes (Alerts) and Pollutant Standards Index Grading

Episode	PSI[a]	Health State	Episode Level and Recommended Protective Action
3rd Stage	400-500	Hazardous	At this hazardous level everyone should remain indoors and minimize physical activity.
2nd Stage	275-400		At this hazardous level everyone should try to avoid outdoor activity. Susceptible persons, especially those with heart or lung disease, should stay indoors.
1st Stage	200-275	Very Unhealthful	At this very unhealthful level everyone, including healthy adults and children, should avoid vigorous outdoor exercise. Susceptible persons, especially those with heart or lung disease, should stay indoors.
Health Advisory	138-200	Unhealthful	At this unhealthful level everyone, including healthy adults and children, should avoid vigorous outdoor exercise. Susceptible persons, especially those with heart or lung disease, should avoid outdoor activity.
Exceeds Federal Clean Air Standard	100-138		At this unhealthful level susceptible persons, especially those with heart or lung disease, should minimize outdoor activity.
No Air Standard Exceedances	50-100	Moderate	No protective action is recommended.
	0-50	Good	No protective action is recommended.

a. PSI (pollutant standard index) is a simplified method of forecasting and reporting air quality conditions on a numerical scale averaging from 0 to 500.

Source: CEQA Air Quality Handbook, page 3-14.

Carbon Monoxide. Carbon monoxide (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 motor vehicles. CO concentrations are influenced by local meteorological conditions, primarily wind speed, topography, and atmospheric stability. Excesses of the State CO standard in the SCAB tend to occur near major motor vehicle traffic corridors when meteorological conditions allow CO to accumulate.

Nitrogen Dioxide. Nitrogen dioxide (NO_2) is a byproduct of fuel combustion. The principle form of NO_2 produced by combustion is NO, but NO reacts quickly to form NO_2, creating the mixture of NO and NO_2 commonly called NO_X. NO_2 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 and three years old) has also been observed at concentrations below 0.3 parts per million (ppm). NO_2 absorbs blue light; in high concentrations the result is a brownish-red cast to the atmosphere and reduced visibility. NO_2 also contributes to the formation of PM_{10}.

Sulfur Dioxide. 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. In the SCAB, no exceedances of federal or state standards occurred in 1996 at any of the seven SCAQMD air monitoring stations that monitor for SO_2 (Final 1997 AQMP, page 2-17).

Respirable Particulate Matter. Respirable particulate matter (PM_{10}) consists of suspended particles 10 microns in diameter or less. 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 for construction; and atmospheric chemical and photochemical reactions. Motor vehicle traffic is the major source of PM_{10} from dust lofted by vehicular turbulence. In 1996, the federal annual standards were not exceeded in Los Angeles or Orange Counties, but they were exceeded in other areas of the SCAB; the more stringent state annual standards were exceeded in all areas of the SCAB (Final 1997 AQMP, page 2-12).

Toxic Air Contaminants. SCAQMD monitors ambient concentrations of TACs, including VOC, in SCAB (SCAQMD 1988). Based on these monitoring data, SCAQMD has estimated an overall public health risk from breathing the air in Los Angeles of about 900 chances of cancer for every million individuals exposed (i.e., 900 X 10^{-6}) in central Los Angeles (SCAQMD, 1988) over one's lifetime. The cancer risk from all sources is 270,000 per million people. The "excess" risk from breathing urban toxic air contaminants is 900 in 270,000, or 0.0033. Because much of this risk derives from benzene, and strong controls on benzene emissions have been promulgated and are being implemented, TAC inhalation risk for young people will be much less in the next 50 years than for people who have already breathed Los Angeles air for the last 50 years.

Microscale Carbon Monoxide Analysis. Local (microscale) carbon monoxide concentrations at intersections and sensitive receptors expected to be affected by project implementation were modeled to establish a baseline against which to evaluate project effects. Sixteen intersections in the project area were evaluated using California Department of Transportation's USEPA-certified CALINE4 Gaussian dispersion model. The results of this analysis are presented in Table 7-50. As shown in Table 7-50 (exceedances of the State standard are shaded; exceedances of the federal standard are bolded), the State and federal one-hour CO standards are violated at 14 intersections and 2 intersections, respectively. The State and federal eight-hour standard is violated at all 16 intersections.

Sensitive Receptors

Some land uses are considered more sensitive to air pollution than other uses due to their occupants, activities, or resources. Land uses such as schools, playgrounds, child care centers, retirement homes, convalescent homes, hospitals, and clinics are considered sensitive to poor air quality because the individuals who typically occupy these sites (children, the elderly, and the ill) are especially sensitive to the effects of air pollutants.

Residential areas also are considered sensitive to air pollution because residents include sensitive sub-groups such as children and the elderly, and because residents are exposed to pollutants for extended periods. Industrial and commercial areas are considered to be the land uses least sensitive to air pollution because workers are considered to be the healthiest segment of the general population and because occupational exposure durations are relatively short.

Recreational areas are considered moderately sensitive to air pollution. Although exposure periods are relatively short, exercise places a high demand on the human respiratory system, which can be impaired by air pollution. Noticeable air pollution can also detract from the enjoyment of outdoor recreation. Native plants and animals may be sensitive to certain air pollutants, and cultural resources may be sensitive to damage from acid rain and fog, and ozone.

Table 7-50
Baseline CO Concentrations at Intersections

Intersection	CO Concentrations[a,b]	
	One-Hour Average	Eight-Hour Average[c]
Crenshaw Boulevard/Wilshire Boulevard	25.3	**17.7**
Crenshaw Boulevard/8th Street	23.4	**16.3**
Country Club Drive/Olympic Boulevard	25.8	**18.0**
Crenshaw Boulevard/Olympic Boulevard	30.9	**21.6**
Arlington Avenue/Olympic Boulevard	29.0	**20.3**
Crenshaw Boulevard/Country Club Drive	20.9	**14.6**
La Brea Avenue/San Vicente Boulevard	31.3	**21.9**
La Brea Avenue/Pico Boulevard	32.1	**22.4**
San Vicente Boulevard/Pico Boulevard	20.5	**14.3**
Rimpau Boulevard/Pico Boulevard	20.2	**14.0**
Mullen Avenue/Pico Boulevard	17.4	**12.1**
West Boulevard/Pico Boulevard	17.2	**12.0**
Crenshaw Boulevard/Pico Boulevard	34.4	**24.0**
La Brea Avenue/Venice Boulevard	**41.2**	**28.8**
San Vicente Boulevard/Venice Boulevard	23.4	**16.3**
Crenshaw Boulevard/Venice Boulevard	**43.2**	**30.2**

NOTES: Shaded cells indicate an exceedance of a State standard; bold numerals indicate an exceedance of a national standard.
a: Based on traffic volumes presented in Section 3-2, and emissions factors and modeling assumptions provided in the Appendix.
b: Receptors are located in accordance with USEPA 1992.
c: Based on 1-hr avg concentrations and a persistence factor (used to derive 8-hr avg from 1-hr avg) of 0.7.

Source: Enviro-Rail, 1995.

For this project, sensitive receptors include ~~residential~~ schools and parks (see Figure 7-22), and residential areas. The project area is primarily residential, with commercial development along several of the major boulevards. Schools within one-quarter mile of the project alignment include Wilton Place School at Wilton Place and 8th Street, a private elementary school at 6th Street and Norton, St. Gregory School at Olympic Boulevard and Norton, and Queen Anne School at Queen Anne and 11th Street. Additional schools in the project vicinity include Los Angeles High School, Burroughs Junior High School, Wilshire Crest School, Mount Vernon Junior High School, and Alta Loma School. Parks in the vicinity of the project alignment include L.A. High Memorial Park at Olympic Boulevard and Muirfield, Henry Park at Francis and 9th Street, Queen Anne Recreation Center at Queen Anne and 12th Street, and Charles Park on St. Charles Place. These sensitive land uses currently are exposed to high levels of air pollution. See Figure 7-22 for the location of these facilities.

Air Quality Planning and Regulatory Environment

Regulatory Agencies

Federal Agencies. Regulatory control over air quality relative to meeting federal clean air standards rests with the U.S. Environmental Protection Agency (EPA). EPA derives its authority from the federal Clean Air Act.

The original federal Clean Air Act (CAA), enacted in 1970, was extensively revised in 1977. The 1977 CAA Amendments revised National Ambient Air Quality Standards (NAAQS) designed to protect public health and welfare. Standards were established for criteria air pollutants, O_3, CO, NO_2, SO_2, and total suspended particulates (TSP). In later years, the TSP standard was revised to address PM_{10}, and a lead standard was established.

The 1977 CAA Amendments (CAAA) required each state to prepare a State Implementation Plan (SIP) describing its plans for attaining compliance with federal air quality goals. The 1977 CAAA also classified air basins as either "attainment" or "non-attainment" areas for each criteria air pollutant, based on whether or not the established standards have been achieved. The 1990 CAAA's reflect revised requirements and deadlines for attainment of NAAQS.

Conformity Regulations

Other federal agencies are prohibited from participating in any project that would interfere with the attainment schedule in a SIP. "Participation" may be through funding, through granting of required permits, or through actual implementation of the project. EPA has published extensive guidelines on establishing project conformity with the applicable SIP. Conformity requires that a project has gone through adequate planning and pre-approval, and that it improve or not measurably worsen air quality. Major transit projects generally easily meet the conformity requirements because they have very long planning lead times and they usually are air quality positive in providing lower pollution alternatives to the single occupant automobile.

State Agencies. The California Air Resources Board (ARB) is responsible for state air quality programs. The ARB may delegate a portion of its responsibilities to local or sub-regional jurisdictions. The ARB generally retains authority over statewide programs such as motor vehicle emission standards while air quality monitoring, stationary source permitting and enforcement, or basinwide air quality planning are subordinated to local air pollution control districts (APCD) or air quality management districts (AQMD).

State Ambient Air Quality Standards (SAAQS) predate the establishment of NAAQS by several years. These standards are designed to protect those people most sensitive to adverse air pollution exposure (called "sensitive receptors"). Existing state and federal AAQS are shown in Table 7-51. The CAAA of 1990 required that EPA consider revising standards if health information warrants. Revisions to the national ozone standard and establishing a standard for ultra-small diameter particulates are currently under discussion. Adoption of new/revised NAAQS is possible by the second half of 1997. SAAQS are generally equal, or normally more stringent thanNAAQS. If federal standards are revised, some modification of state standards may follow suit.

Local Agencies

South Coast Air Quality Management District. SCAQMD is the regional agency charged with meeting state and federal air quality goals. SCAQMD has authority for reducing emissions from stationary sources and has limited authority over mobile sources and consumer products. In 1987, State Senate Bill 151 gave SCAQMD substantial new authority to develop transportation control measures and rules for indirect sources of air pollutants,

Table 7-51
Ambient Air Quality Standards

Air Pollutant	State Standard	Federal Primary Standard	Most Relevant Effects
	Concentration/Averaging Time[a]	Concentration/ Averaging Time[a]	
Ozone (O_3)	0.09 ppm, 1-hour avg.>	0.12 ppm, 1-hour avg>	(a) Short-term exposures: (1) Pulmonary function decreases and localized lung edema in humans and animals, (2) Risk to public health impled by alterations in pulmonary morphology and host defense in animals; (b) Long-term exposures: risk to public health implied by altered connective tissue metabolism and altered pulmonary morphology in animals after long-term exposures and pulmonary function decrements in chronically exposed humans; (c) vegetation damage; (d) property damage.
Carbon Monoxide (CO)	9.0 ppm, 8-hour avg.> 20 ppm, 1-hour avg.>	9 ppm, 8-hour avg.> 35 ppm, 1-hour avg.>	(a) aggravation of angina pectoris and other aspects of coronary heart disease; (b) decreased exercise tolerance in persons with peripheral vascular disease and lung disease; (c) impairment of central nervous system functions; (d) possible increased risk to fetuses
Nitrogen Dioxide (NO_2)	0.25 ppm, 1-hour avg.>	0.053 ppm, annual avg >	(a) potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups; (b) risk to public health implied by pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes; (c) contribution to atmospheric discoloration.
Sulfur Dioxide (SO_2)	0.04 ppm, 24-hour avg.> 0.25 ppm, 1-hour avg.>	0.03 ppm, annual avg.> 0.14 ppm, 24-hour avg >	(a) bronchoconstriction accompanied by symptoms which may include wheezing, shortness of breath and chest tightness, during exercise or physical activity in persons with asthma.
Suspended Particulate Matter (PM_{10})	30 $\mu g/m^3$, annual Geometric mean > 50 $\mu g/m^3$, 24 hour average >	50 $\mu g/m^3$, annual arithmetic mean > 150 $\mu g/m^3$, 24-hour avg.>	(a) excess deaths from short-term exposures and exacerbation of symptoms in sensitive patients with respiratory disease; (b) excess seasonal declines in pulmonary function, especially in children.

Table 7-51
Ambient Air Quality Standards

Air Pollutant	State Standard	Federal Primary Standard	Most Relevant Effects
	Concentration/Averaging Time[a]	Concentration/ Averaging Time[a]	
Sulfates (SO_4)	25 $\mu g/m^3$, 24 hour average>=	No Federal Standard	(a) decrease in ventilatory function; (b) aggravation of asthmatic symptoms; (c) aggravation of cardio-pulmonary disease; (d) vegetation damage; (e) degradation of visibility; (f) property damage.
Lead (Pb)	1.5 $\mu g/m^3$, 30 day average>=	1.5 $\mu g/m^3$, calendar quarter >	(a) increased body burden; (b) impairment of blood formation and nerve conduction.
Visibility-reducing Particles	In sufficient amount to reduce the visual range to less than 10 miles at relative humidity less than 70 percent, 8-hour average (10 am - 6 pm)	No Federal Standard	Visibility impairment on days when relative humidity is less than 70 percent.

Source: Final 1997 AQMP, Table 2-1, page 2-2.
a. $\mu g/m^3$ = Micrograms per cubic meter; ppm = parts per million.

such as shopping centers, stadiums, and other facilities that attract large volumes of motor vehicles. SCAQMD also is required to develop additional programs and regulations for increasing commuter ridesharing and limiting heavy truck traffic on urban freeways during peak commute hours.

SCAQMD is required to prepare an Air Quality Management Plan (AQMP) that addresses attaining and maintaining compliance with NAAQS and SAAQS in SCAB. SCAQMD adopted a 1994 AQMP (SCAQMD and SCAG 1994) in September 1994. The 1994 AQMP contains air pollution control measures for stationary sources and on- and off-road mobile sources that could apply to the project. The 1994 AQMP was finally approved by EPA in 1996 as part of the SIP. An evaluation of project conformity will be relative to the currently approved SIP.

The CAAA requires that clean air plans be updated periodically for all non-attainment areas. The California Clean Air Act (CCAA; Sher-AB-2595) similarly requires development and periodic revision of a plan to meet SAAQS. A revised AQMP for federal standards was prepared in February, 1997. The CCAA plan update is due at the end of 1997. The revised AQMP prepared early in 1997, ~~and~~ contain~~ing~~ an attainment plan for PM_{10} for the first time and ~~ever~~, is designed to meet both federal and state planning requirements. If and when the EPA approves the 1997 submittal, it will become the operative SIP. Air quality modeling in support of the 1997 submittal suggests that air pollution reductions needed to meet federal AAQS are less stringent than previously anticipated. There is no strong consensus in the technical community that the assumptions used to support this finding are completely valid. Because the air quality planning process is affected by political and socioeconomic pressures in addition to scientific principles, these forces may inhibit ~~sometimes intermingle that precludes~~ basing the planning process on technical merits alone.

As part of the AQMP, SCAQMD structures most of its pollution control programs through its <u>Rules and Regulations</u>. SCAQMD's <u>Rules and Regulations</u> include rules that apply to project construction or operation. Rules that may apply to the proposed project include: Rule 401 - Visible Emissions; Rule 402 - Nuisance Emissions; Rule 403 - Fugitive Dust; and Rule 1166: Volatile Emissions from Soil Decontamination.

Southern California Association of Governments. SCAG is responsible for adopting the annual Regional Transportation Improvement Program (RTIP), and local governments are responsible for implementing suggested transportation and land use measures including transportation control measures. SCAG's Regional Comprehensive Plan (SCAG 1994) is thus directly linked to the AQMP. SCAG's Carbon Monoxide Transportation Project Protocol (1992) provides guidance for preparing CO analyses for transportation projects within its jurisdiction. A project's presence in the RTIP is a necessary indication that it has been incorporated into the regional transportation plan as a basis for a finding of conformity with the AQMP/SIP.

7.12.2 <u>Project Impacts</u>

<u>Thresholds of Significance Criteria</u>

Direct project effects on air quality could include short-term impacts during construction or long-term impacts from operation of project facilities.

<u>Construction</u>

Construction activity impacts to air quality could result from emissions of criteria air pollutants or TACs or the generation of odor. Primary effects could include short-term degradation of air quality during construction. Secondary effects could include creating the potential for an accidental release of hazardous materials or conflicts with regional plans. The significance criteria and thresholds described below address these potential effects.

Criteria Air Pollutants

Federal and State air quality management agencies have developed ambient air quality standards suitable for use as thresholds of significance during project construction. SCAQMD is charged with enforcing both State and federal standards, rules, and regulations. Construction of the project would be considered to have a significant impact on air quality if it caused or contributed to a projected exceedance of one of these standards, or if it causes a measurable worsening of an existing violation. "Measurable worsening" for regional pollutants such as photochemical smog can typically not be explicitly calculated on a single project basis. The South Coast Air Quality Management District (SCAQMD 1993) therefore has developed significance criteria and thresholds for air emissions based on the volume of emissions alone even if the actual resulting ambient air quality can not be explicitly calculated. The SCAQMD thresholds for construction activities are:

- 2.5 tons per quarter or 75 pounds per day of reactive organic compounds (ROC);
- 2.5 tons per quarter or 100 pounds per day of nitrogen oxides (NO_x);
- 24.75 tons per quarter or 550 pounds per day of carbon monoxide (CO);
- 6.75 tons per quarter or 160 pounds per day of suspended particulate (PM_{10}); and
- 6.75 tons per quarter or 150 pounds per day of sulfur oxides (SO_x).

Odor

The odor threshold for H_2S varies with individual sensitivity, but is generally given to be between 0.003 and 0.02 ppm. Based on historical records of odor complaints received for other public works projects in Los Angeles County, however, a significance threshold of 0.01 ppm has been established by MTA (Engineering Management Consultant, 1995). This threshold is substantially more stringent than the State public health threshold of 0.03 ppm.

Release of Toxic Air Contaminants from Hazardous Material

TACs are compounds which are known to adversely affect the health of individuals exposed to certain concentrations for certain periods. The potential health effects of these TACs include cancer, chronic non-cancer effects on various organs of the body, and acute non-cancer effects. Added or excess cancer risk is the significance criterion for the human health risk analysis.

State CEQA Guidelines, Section 15065(d) considers the environmental effects of a project to be significant when the project "... will cause substantial adverse effects on human beings, either directly or indirectly." *State CEQA Guidelines*, Appendix G, draws particular attention to those project which will "... create a potential public health hazard." To evaluate the significance of a potential risk to public health or safety, *State CEQA Guidelines*, Section 15064(I) states that, "if an air emission ... meets the existing standard for a particular pollutant, the Lead Agency may presume that the emission or discharge of the pollutant will not be a significant effect on the environment."

Operation and Maintenance

Air quality impacts are theoretically directly linked to AAQS which characterize the pollution level of the air breathed by basin residents. Unfortunately, many air pollutants require additional transformation after release into the air until they reach their most unhealthful form. This may require several hours or even days to complete the conversion process. By the time this process is completed, emissions from any single source of air pollution will be miles away and will have been diluted to an undetectably small increment. It is, however, the cumulative effect of thousands of such small increments that leads to the degraded (but steadily improving) air quality found in the SCAB. The SCAQMD has therefore developed advisory significance thresholds based only on the quantity of emissions that it recommends be considered by a Lead Agency in evaluating project impact. These surrogate, emissions-based thresholds are based, in part, on the emissions level used by federal agencies in defining a de minimis emissions increase in areas with "extreme air quality non-attainment." Operational project-related air quality impacts analyzed in this SEIS/SEIR are considered significant if the significance thresholds for any of the criteria described below are exceeded.

Criteria Air Pollutants

Direct Indicators. SCAQMD is the local agency charged with enforcement of both federal and state air quality standards and goals. SCAQMD (1993) has developed the following significance thresholds applicable to total operational project emissions:

- 55 pounds/day of volatile organic compounds (VOC);
- 55 pounds/day of nitrogen oxides (NO_x);
- 550 pounds/day of carbon monoxide (CO);
- 150 pounds/day of respirable particulate (PM_{10}); and
- 150 pounds/day of sulfur oxides (SO_x)

In addition to the emissions thresholds of significance presented above, SCAQMD has established ambient concentration thresholds of significance for those pollutants whose impact can be established in terms of an actual ambient level (see Table 7-52).

Table 7-52
Ambient Concentration Significance Threshold Increments

Pollutant	Averaging Period	"Significant" Change in Ambient Concentration
Nitrogen Oxides	1-hour annual	1.0 pphm 0.05 pphm
Carbon Monoxide	1-hour 8-hour	1.0 ppm 0.45 ppm
Respirable Particulate	24-hour annual	2.5μg/m³ 1.0μg/m³
Sulfate	24-hour	1μg/m³

Source: South Coast Air Quality Management District, Rule 1303, Table A-2.
Note: Modeling for VOC and SO_x is not required; ppm = parts per million; pphm = parts per hundred million; μg/m³ = micrograms per cubic meter.

Indirect Indicators. In addition to direct indicators (emissions or ambient air quality increments), the SCAQMD has developed indirect criteria that would further indicate a potentially significant air quality impact. SCAQMD (1993) has identified the following four indirect indicators of potential air quality impacts (secondary effects) that may pertain to any of the project alternatives:

- Interference with attainment of the NAAQS or SAAQS by either violating or contributing to an existing or projected air quality violation;

- Projects that are inconsistent with the AQMP/SIP;
- Vehicle trips that create a carbon monoxide hot spot;
- the potential to subject a sensitive receptor to an objectionable odor; and
- Effects from TACs including: an accidental release of TACs or acutely hazardous materials emissions; emissions of TACs regulated by SCAQMD Rules, or that are on federal or State TAC lists; and emissions of TACs that adversely affect sensitive receptors, or cause calculated risk levels to exceed the maximum individual cancer risk of 10 excess cases of cancer in one million lifetime exposures.

Odor

Odor is generated by a variety of volatile substances, mostly by organic compounds. The odorous compound most likely to be emitted by the project is hydrogen sulfide (H_2S), so H_2S is being used as an indicator for odor. The significance criteria for odor is detectable odors for a sustained period or intermittently over a long period. The odor threshold varies with individual sensitivity, but generally is in the range of 0.003 to 0.02 ppm.[2] Odor nuisance is subjective, and often odor strengths are not quantifiable except through qualitative means. Odor strength is generally characterized by the number of times an air sample must be diluted ~~of dilutions~~ with "clean" ~~unodorized~~ air ~~required until less than one-half of all people can detect a given odor~~ before the odor is no longer detectable to an average adult with average odor sensitivity. The number of dilutions needed to reach this threshold level is referred to as a ~~"odor units" or~~ "dilution-to-threshold" (D/T) factor. An odor with a D/T of 2 (2 parts of clean air to one part of odorous air) becomes faintly detectable to almost all receptors ~~is a measure of odor intensity, but does not necessarily incorporate any possible sense of unpleasantness~~.

The SCAQMD (1993) acknowledges that at 5 D/T, an unpleasant odor is clearly noticeable to most people. At 10 D/T, an unpleasant odor evokes a noticeable rise in public complaint. The SCAQMD Handbook thus recommends a 10 D/T level as an odor significance threshold. For H_2S as the primary project-related odorant, 1 D/T is approximately 0.003 ppm. A significance threshold for odor detection of 0.03 ppm; i.e., 10 D/T, is being used for this analysis. This threshold is equal to the State's odor based public health threshold (one-hour average) of 0.03 ppm. While the SAAQS is for one hour, a short-term, project-related H_2S level of 0.03 ppm, regardless of exposure duration, is considered significant.

Toxic Air Contaminants

Project-related traffic would emit trace amounts of TACs into the atmosphere. These include benzene, butadiene, formaldehyde, chromium, and products of incomplete combustion (PICs). These TACs would be emitted in insignificant quantities, and thus were not quantitatively estimated. They would presumably occur in even greater amounts if the project did not divert vehicular traffic into more pollution-efficient mass transit.

Regulatory Consistency and Conformity

Conformity with the federal Clean Air Act is a requirement for major transportation projects funded by a federal agency. Substantial conflict of an alternative with existing regulations, plans, and policies would normally constitute a significant impact, according to Appendix G of the *State CEQA Guidelines*. Regional plans to consider for project consistency include SCAG's *Growth Management Plan* and *Regional Mobility Plan*, and SCAQMD's AQMP. Specific regulations to be considered include SCAQMD Rules.

[2]/ Amanda Elioff, EMC Team, Memo R82-MC-DE480/PD400 of September 27, 1995 to Robert Weiss, Team Project Manager, Segment 3.

7.12.2.1 Construction

No Project Alternative

Under this alternative, the predicted effects of project construction on air quality would not occur.

Alternatives A, B1, B2, and C

Air quality impacts from the project would result from utility relocation, site clearing, tunneling, and cut-and-cover construction activities. Emissions would derive from on-site equipment exhaust, off-site truck emissions, and from fugitive dust generated during demolition and surface disturbance. Impact significance has been evaluated relative to the emissions-based thresholds from the SCAQMD Handbook because most emissions are either too variable in space and time, or require complex transformations, before reaching their most unhealthful state.

The one construction pollutant that might lead itself to reasonable ambient air quality impact quantification would be particulates. Particulates may exist as large diameter material that redeposits close to the source, or as fine particulates that remain suspended in the air semi-indefinitely. Impacts to schools and other sensitive uses can be approximately determined. There was no explicit particulate impact calculation prepared for several reasons, however, as follows:

1. Particles larger than 100μ (microns) in diameter fall out within 20-30 feet of their release, while even particles down to 30μ in diameter have a trajectory that only carries 200-300 feet (EPA, AP-42, p. 13.2-2).

2. Recent research has shown that most adverse health effects derive from particles smaller than 2.5μ in diameter. Almost all particles generated by construction, except for equipment exhaust soot, are larger than 2.5μ. SCAQMD monitoring shows that only one percent of all sub-2.5μ diameter particulate matter (called PM-2.5) is from soil materials.

3. Most sensitive daytime receptors, especially the nearest LAUSD schools, are already, or will be, air-conditioned by the time project construction begins.

Particulate matter impacts were therefore evaluated only relative to their total contribution to the regional emissions burden.

An ~~additional~~ assessment has been performed to determine whether there would be ~~are new~~ significant impacts that would result from the use of either Earth Pressure Balance (EPB) tunnel boring machines (TBM) ~~compared to~~ or the conventional tunneling technology evaluated in this section ~~document~~ as the worst case scenario. ~~The air quality assessment of the conventional tunneling technology indicated that there would be significant construction impacts relative to PM_{10} in terms of the pounds of emissions per day.~~

Criteria Air Pollutant Emissions

Utility Relocation

Project construction would require the relocation of some storm drains and sewer lines in the project area. (Please refer to Section 7-13, Utilities, for a complete description of utility relocations.) Air pollutants would be emitted during: a) demolition, b) excavation, c) earth-moving operations; and d) use of powered construction equipment at the construction sites. Off-site (away from where the utility facility construction area) emissions of air pollutants would result from transport of construction materials to and from the construction sites, and construction worker commute trips. During active periods of construction, all equipment assigned to utility relocation is assumed (worst case) to be in operation - on the average - for 10 hours per day.

Equipment exhaust emissions from a representative construction fleet for similar projects were calculated by combining operating hours with equipment emission factors to produce a daily emissions burden shown in Table 7-53. Criteria air pollutant emissions from utility relocation presented in Table 7-53 would exceed SCAQMD's applicable significance threshold. Assumptions on hours of operations under load are likely overly conservative. However, the SCAQMD thresholds are exceeded by a very wide margin, especially for NO_x. Any limited modification in equipment use assumptions would not change any conclusions regarding temporary impact significance.

As shown in Figure 4-1 (Estimated Construction Schedule), utility relocations would last approximately one-year for Alternatives A and B, and two years for Alternative C. While on a daily basis, the amount of air pollutants emitted by each alternative would be approximately the same, Alternative C would produce twice the total amount because of their extended construction schedule.

Site Clearing/Preparation

The project would require demolition of existing uses to establish construction staging areas at the intermediate and terminus station sites. The main construction staging areas for Alternatives A and B would be located within the block bounded by Pico, San Vicente, Venice, and West Boulevards; a second construction staging area would be located on the southwest corner of Olympic Boulevard and Arlington Avenue. Alternative C would locate its main construction staging area at the same location as Alternatives A and B; another one would be located on the west side of Crenshaw Boulevard between Wilshire Boulevard and 8th Street, and the third one would be located on the northeast and southwest corners of Olympic and Crenshaw Boulevards. In addition, Alternative C would have two mid-tunnel vent structures; one would be located on the southwest corner of Norton Avenue and Wilshire Boulevard, and the other on the northwest corner of Pico Boulevard and Victoria Avenue.

Depending upon a decision on the disposition of the tunnel boring machines (TBMs) once they reach the existing Wilshire/Western Station connection point, an excavation for TBM extraction may also be necessary. Air pollutants would be emitted during: demolition and removal of existing structures; and use of powered construction equipment at the construction sites. Sources of off-site emissions of air pollutants from site clearing would be similar to those from utility relocation. Assumptions regarding the use of construction equipment would be similar to those assumptions made for utility relocation. Criteria air pollutant emissions from site clearing/ preparation presented in Table 7-53 would individually exceed SCAQMD significance thresholds for CO and NO_x.

Tunneling

The proposed project would generate air pollutant emissions from: excavation of the access shaft; excavation of soils from the tunnel; and stockpiling of excavated soils at the construction staging areas. Off-site emissions of air pollutants would result from transport of excavated materials from the construction sites and construction worker commute trips. During active periods of construction, tunneling equipment would be operating 24 hours per day (worst-case assumption). Trucking of excavated material would be restricted to daytime hours. Criteria air pollutant emissions from tunneling, presented in Table 7-53, would exceed SCAQMD's applicable significance threshold for all five pollutants analyzed.

Cut-and-Cover and Station Construction

The project would require cut-and-cover construction for stations and shallow tunneling. The Olympic/Arlington Station (Alternatives A, B1, and B2) or the Olympic/Crenshaw Station (Alternative C) would be constructed with cut-and-cover construction methods. The Pico/San Vicente Underground Station (Alternatives A and C) would also be constructed with cut-and-cover construction methods. Both Venice/San Vicente Station options (Alternative B1, open air lower elevation, and Alternative B2, open air higher elevation) would require grading, but they would remain open to the air. Shallow sections of the twin tunnels that would require cut-and-cover construction methods include: Pico Boulevard between Victoria Avenue and the Pico/San Vicente Station (Alternatives A and C); Venice Boulevard between Victoria Avenue and the Venice/San Vicente Station (Alternatives B1 and B2); and Crenshaw Boulevard between 8th Street and a point 1,100 feet south of the Country Club Drive (Alternative C).

Air pollutants would be emitted during: installation of soldier piles; deck placement over the street~~ areas to be disturbed~~; installation of tunnel support and excavation of the tunnel interior; construction of line segments and stations; and street restoration. Off-site emissions of air pollutants would result from transport of excavated materials from the construction sites and construction worker commute trips. During active periods of construction, all equipment assigned to cut-and-cover or station construction activities would be in operation -- on the average -- 10 hours per day (worst-case assumption). Criteria air pollutant emissions from surface-based excavation activities, presented in Table 7-53, would exceed SCAQMD's applicable significance threshold.

Odor

For this project, sensitive receptors include uses adjacent to the project alignment and uses adjacent to potential construction staging sites. Emissions of criteria air pollutants, identified in Table 7-53, would not result in a significant odor impact on sensitive receptors. Project design features which would be implemented to reduce potential effects of H_2S on sensitive receptors include location of the project alignment at an elevation above soils containing high concentrations of H_2S and the use of pre-venting during project construction, as needed. In addition, standby or intermittent air injection would be installed prior to construction at station areas and sections of the tunnels where higher H_2S readings have historically been found. Probe holes also would be tested ahead of tunnels; where probes indicate higher gas levels than predicted, additional measures would be taken such as activation of gas extraction, slowing construction advance, or increasing ventilation rates. With implementation of these design features and measures, H_2S gas emissions would not exceed the State public health threshold for H_2S of 0.03 ppm as a one-hour average. Odors within the immediate construction environment could intermittently exceed the odor detection threshold. Possible public exposure would be confined to the Olympic/Crenshaw Station (Alternative C) or Pico/San Vicente Station (Alternatives A and C) areas. If odor were detectable in significant amounts, use of the odor control measures noted above would be accelerated. Thus, under Alternatives A and C, potential impacts to sensitive receptors from H_2S odors could be a significant adverse impact of the project.

H_2S was not detected in the borings immediately around the Olympic/Arlington Station (Alternatives A, B1, and B2).

Toxic Air Contaminant Release from Hazardous Materials

Hazardous materials (e.g., solvents) routinely used during construction would be stockpiled in limited quantities, and their containers would be regularly checked for leaks by construction personnel. In the event of an accidental release of air toxic emissions from these hazardous materials, standard industry practices would be implemented to reduce the severity of the release on public health. Thus, the potential threat to public health and safety from such a release would not be significant.

Table 7-53
Construction Air Pollutant Emissions

Project Element	Emissions (pounds/day)				
	CO	ROC	NO_x	SO_x	PM_{10}
1. Utility Relocation[a]	1,412	292	2,892	263	341
2. Site Clearing/Preparation[b]	532	73	994	85	142
3. Tunneling[c]	2,865	668	6,415	587	675
4. Cut-and-Cover Tunnels, Station, Construction (Alternatives A and B)	1,412	292	2,892	262	341
5. Cut-and-Cover Tunnels, Station, Construction (Alternative C)[d]	2,824	584	5,783	525	682
SCAQMD Significance Threshold	550	75	100	150	150
Peak Day: Elements 1 and 2	1,944	365	3,886	348	483
Peak Day: Elements 1, 2 and 4	3,356	657	6,778	610	824
Peak Day: Elements 1, 2 and 5	4,768	949	9,669	873	1,165
Peak Day: Elements 3 and 4	4,277	960	9,307	849	1,016
Peak Day: Elements 3 and 5	5,689	1,252	12,198	1,112	1,357

a. Assumes one at a time.
b. Each site cleared and prepared at a different time.
c. Assumes one twin-bore tunnel segment at a time for Alternative C.
d. Assumes cut-and-cover would occur in Pico and Crenshaw Boulevards simultaneously.

Notes: Emissions estimates presented in this table are based on the methods described in Appendix 9 of CEQA Air Quality Handbook (SCAQMD, 1993). Subtotals and totals may no add exactly due to rounding of individual entries. All peak day values exceed the applicable significance threshold.

Source: Enviro-Rail, 1995 (Alternative C); Ultrasystems Environmental Incorporated, 1997 (Alternatives A and B)

Site clearing for construction staging areas would require that some buildings be demolished. These buildings could contain asbestos which -- although not a TAC -- could pose health risks to exposed workers. A State-certified asbestos abatement contractor would survey the buildings and remove the asbestos prior to demolition, to reduce this potential effect to a level of insignificance.

Emissions Characteristics of EPB Technologies[3]

Based on available engineering information, it is projected that the EPB technologies will have a tunnel drive rate of approximately 40 feet per day. This is approximately 60 feet per day less than what would be ~~was~~ estimated for the conventional tunneling technology. This fact alone indicates that the daily emissions from excavation would ~~will~~, in general, be 60 percent less than those for the conventional method ~~estimated in the FEDS~~ because of the slower daily rate of construction. ~~Given that the total amount of excavated material remains unchanged, the total emissions from excavation would remain the same.~~ The daily emissions would be reduced while the duration of emissions would be longer.

~~In addition to the excavation rate difference, other aspects of the proposed EPB tunneling technologies were investigated to determine if there were any new emissions sources that would need to be disclosed, and whether these new emissions sources would result in emissions impacts greater than those discussed in the FEDS.~~ As discussed in the project description of this assessment, there are two alternate technologies for EPB tunnel boring. One technology may incorporate a foaming additive, under certain soil conditions, to improve the cohesiveness of the soil during tunnel boring; and the other technology uses a slurry to improve soil cohesiveness during tunnel boring and during excavation of the debris from the machine face.

The foam EPB tunnel boring technology, from an air quality perspective, is similar to conventional tunneling. Excavated debris is transported to the surface via muck cars or conveyor, stock piled, then hauled away. The foaming additive is pressurized in a reaction chamber and is injected at the tunnel face. The foam breaks down relatively quickly, and appears not to have any air quality emissions. The slurry EPB technology does make use of a clay mineral called bentonite as a key ingredient of the slurry mix. Bentonite is commonly referred to in the petroleum industry as "drilling mud," and is non-reactive and non-toxic. When mixed with water, the bentonite clay can expand five to fifty times in volume. Bentonite's ability to attract and retain water molecules helps to lubricate cutting wheels and its colloidal characteristic helps to improve soil stability and the cohesiveness of the muck for removal. The transport and mixing of bentonite in the slurry process would be the primary source of PM_{10} emissions. The extent of the PM_{10} emissions is dependent on a number of factors that are discussed below:

Transport. Bentonite clay comes in several forms including powder, granules, pellets, and biodegradable gel. Powder bentonite (assumed to be the worst case for air quality analysis) is deliverable in bags or in bulk quantities. Industry standards for bulk shipments utilize closed shipping containers that load and unload dry bentonite pneumatically. This shipping method can significantly reduce PM_{10} emissions. Bags however, are deliverable in haul truck, in this regard, an uncovered haul truck (as a worst case scenario) could be a source of PM_{10} emissions.

Batching/Mixing. Although the slurry mixture is highly dependent on geology and soil conditions encountered in tunneling, the generally accepted proportion of bentonite, from discussion with experts in the micro-tunneling industry, is six percent of the water weight (one cubic foot of water weighs 62.4 pounds). This mixture is typically prepared at the ground surface. In this process, the transfer of bentonite from storage or haul truck into water could also be a source of PM_{10} emissions. PM_{10} emissions during this process could be significant unless mitigated.

Quantities Required. A final factor that affects potential emissions is the quantities of bentonite that may be used. The amount of bentonite used would be the greatest at tunnel startup; bentonite used would then drop off to that amount not recycled. In general, it is estimated that 600 gallons of slurry are needed to excavate one ton of earth. Based on the six percent ratio, a 600 gallons slurry mix would contain approximately 300 pounds of bentonite.

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[3]/ Information in this section was obtained from the Modified Initial Study/Environmental Assessment for the Proposed Modifications to the Metro Red Line East Side Extension from Union Station to First/Lorena, March 1997.

Under these circumstances, the bentonite slurry is pumped to the EPB TBM, and then via 12-18 inch pipes, the bentonite slurry conveys excavated debris to the surface where the debris is screened off. It is then centrifuged and the bentonite slurry is recycled. The amount of bentonite slurry that is recycled is dependent on the soil conditions encountered and the amount of bentonite slurry used at the EPB TBM face. Industry sources expect that 80 percent of the bentonite in the slurry can be recycled under typical circumstances. If this is not possible due to site specific conditions, then emissions related to transport and mixing of bentonite at the surface would increase. This would be a significant impact unless mitigated.

Estimate of Bentonite Emissions

Based on the excavation rate of 40 feet per day per TBM, it is estimated with two TBMs in operation that approximately 1,620 tons of debris would be excavated each day. Assuming that the bentonite can be recycled with a 20 percent loss, this would require approximately 49 tons of bentonite per day.[4] The estimated bentonite emissions from the mixing and transportation of 49 tons of bentonite per day would range from 23 to 47 pounds per day, assuming a material transfer PM_{10} emissions rate similar to concrete batching (best case scenario) and coal ore transfers (worst case scenario) plus the PM_{10} emissions from vehicle movement on 200 feet of unpaved roads.[5]

Table 7-54 summaries projected PM_{10} emissions with one, two, or three TBMs in operation. For all of these conditions, PM_{10} emissions would be below SCAQMD thresholds. If bentonite loss is significant or if none can be recycled, the presumed excavation rate would require 244 tons of bentonite per day (300 lbs of bentonite x 1,620 tons of soil/2,000 pounds) with resulting PM_{10} emissions ranging from 77 to 194 pounds per day (see Table 7-55). The PM_{10} emissions under the worst case scenario and without the recycling process would exceed SCAQMD daily emissions threshold criteria by 44 pounds if two TBMs were in operation. This would be a significant impact unless mitigated.

Based on the discussion of the worst case scenario, PM_{10} impacts from the use of powder bentonite can be minimized through applying the best available control technology method or using alternative forms of bentonite such as pellets, granules, or biodegradable gel. If bentonite is to be used in its powder form, it would be necessary to implement additional mitigation measures to ensure that PM_{10} emissions are minimized.

7.12.2.2 Operations and Maintenance

Source of Emissions

No Project Alternative

Under the No Project Alternative, the operational emissions of the project would not be generated. Travel in the project area would continue to be primarily via private automobile and bus. Whereas bus travel on a per-capita basis is relatively efficient and per-capita emissions or air pollutants are minor, air pollutant emissions from automobile travel, especially single-occupant vehicles, is the largest single source of air pollutants in SCAB. Under the No Project Alternative, air quality benefits associated with reduced automobile travel would not be realized.

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[4]/ 300 pounds of bentonite at start-up for each TBM; add 60 pounds for each additional ton of excavated soil ([{300 lbs + 300 lbs} + {60 lbs x 1,618 tons}]/2,000 lbs).

[5]/ USEPA Compilation of Air Pollutant Emissions Factors and Control of Open Fugitive Dust Sources (AP-42); 0.27 lbs/ton for concrete batching; 0.75 lbs/ton for coal ore transferring; and 0.86 lbs/VMT on unpaved roads.

Table 7-54
Bentonite Consumption and Emissions With Recycling

TBM (Operation)	Soil Excavation (tons/day)	Bentonite Used (tons/day)	VMT[a] on Unpaved Roads (UR) (miles)	SCAQMD PM_{10} Emissions Thresholds (lbs/day)	PM_{10} Emissions[b] From Use of Bentonite (.75 lbs/day)	PM_{10} Emissions[c] From VMT on UR (.86 lbs/mile)	Total PM_{10} Emissions (lbs/day)
1 TBM in operation	810	24.5	6	150	5	18	23
2 TBMs in operation	1,620	49.0	11	150	10	37	47
3 TBMs in operation	2,430	73.5	17	150	15	55	70

a. VMT (vehicle miles traveled) on unpaved roads is based on vehicle traffic on construction site.
b. Projection was based on a worst case scenario using coal ore transferring PM_{10} emission factors from the USEPA Compilation of Air Pollutant Emissions Factors (AP-42).
c. Emission factors for unpaved roads were calculated from using USEPA Control of Open Fugitive Dust Sources (AP-42).
Source: Modified Initial Study/Environmental Assessment for the Proposed Modifications to the Metro Red Line East Side Extension from Union Station to First/Lorena, March 1997.

Table 7-55
Bentonite Consumption and Emissions Without Recycling

TBM (Operation)	Soil Excavation (tons/day)	Bentonite Used (tons/day)	VMT[a] on Unpaved Roads (UR) (miles)	SCAQMD PM_{10} Emissions Thresholds (lbs/day)	PM_{10} Emissions[b] From Use of Bentonite (.75 lbs/day)	PM_{10} Emissions[c] From VMT on UR (.86 lbs/mile)	Total PM_{10} Emissions (lbs/day)
1 TBM in operation	810	122	6	150	92	6	98
2 TBMs in operation	1,620	244	13	150	183	11	194
3 TBMs in operation	2,430	366	19	150	275	17	292

a. VMT (vehicle miles traveled) on unpaved roads is based on vehicle traffic on construction site.
b. Projection was based on a worst case scenario using coal ore transferring PM_{10} emission factors from the USEPA Compilation of Air Pollutant Emissions Factors (AP-42).
c. Emission factors for unpaved roads were calculated from using USEPA Control of Open Fugitive Dust Sources (AP-42).
Source: Modified Initial Study/Environmental Assessment for the Proposed Modifications to the Metro Red Line East Side Extension from Union Station to First/Lorena, March 1997.

Future emissions levels are expected to decrease relative to existing levels due to mandated improvements in vehicular efficiency.

Alternatives A, B1, B2, and C

Project emissions of air pollutants can be categorized as stationary (e.g., vent shafts) or mobile (e.g., automobiles. Emissions sources may be point sources (e.g., vent shafts [Alternative C only]), line sources (e.g., roadway links) or area sources (e.g., parking lots). Emissions can be a direct result of project activities (e.g., project-generated traffic) or an indirect effect (e.g., increased demand on regional power plants). Off-site emissions (e.g., employee trips) are distinguished from on-site emissions (e.g., parking lot emissions). While these emissions sources are described and their effects quantified separately below, operational air pollutant emissions are combined for the purpose of determining their significance.

Stationary Sources. On-site stationary sources of air pollutants associated with the project would include: station operations; water treatment systems; vent shafts; park-and-ride, kiss-and-ride, and bus transfer facilities. Off-site stationary sources include regional power plants. Both criteria air pollutants and trace amounts of TACs would be emitted by the various elements of the project.

- **Stations**. Operation of the two proposed stations would require the consumption of electricity generated by regional power plants. This power consumption is addressed below under Regional Power Plant Emissions.

- **Water Treatment System** (Alternatives A and C). A water treatment system may be required to remove H_2S or dissolved organic gases from any groundwater ~~elemental water~~ leaking into the underground stations and tunnels. The water would be treated by oxidizing the H_2S to sulfur and by adsorption of the dissolved organic compounds with activated carbon. Hydrogen peroxide (H_2O_2) would be used to nearly fully oxidize the H_2S. Most remaining H_2S would be removed by adding caustic soda (lye) to the water to increase its alkalinity. Additional system components could include an oil/water separator, granulated activated carbon units, filters, piping, valves, and instrumentation associated with the system. The storage of hydrogen peroxide and caustic soda in conjunction with operation of the treatment plant is not considered to constitute a hazardous condition with regard to SCAQMD criteria for indirect air quality impacts.

  Operation of the water treatment system would consume electricity for pumps and water treatment processes. Emissions from this use of power are addressed below under Regional Power Plant Emissions.

- **Ventilation Shafts (Alternative C only)**. The stations and tunnels would be ventilated via shafts located along the alignment. The ventilation shafts are proposed to be located on the northwestern corner of Victoria Avenue and Pico Boulevard and the southwest corner of Norton Avenue and Wilshire Boulevard. Ventilation air could include low concentrations of H_2S diffusing into the tunnels and stations from the surrounding subsurface. Project design features implemented to reduce potential H_2S concentrations in tunnels and stations would keep H_2S below the State's public health threshold of 0.03 ppm, but H_2S concentrations could occasionally exceed the odor detection threshold of 0.01 ppm. Vented air would contain essentially the same concentrations of H_2S as found in the tunnels and stations, so the project could occasionally generate odors in the vicinity of the vent structures (odors would be rapidly diluted in the ambient air to concentrations below the odor threshold). Because H_2S concentrations resulting from the air ventilation shafts would not be detectable for sustained periods and occasional odors from H_2S are not expected to occur regularly over a long period of time, significant odor impacts are not expected.

In saturated zones, H_2S would be trapped in ground water and would first need to be converted to a gaseous state. The water treatment would strip H_2S or other odorous gases before they escape ~~evolve~~ into the air in any significant concentrations. The water would be treated by oxidizing the H_2S to sulfur and by adsorption of the dissolved organic compounds with activated carbon. Hydrogen peroxide (H_2O_2) would be used to nearly fully oxidize the H_2S; the water's alkalinity would be adjusted from pH 7 to pH 10, which is expected to convert 50% - 90% of any remaining H_2S to a non-volatile ion, (HS^-). Additional system components could include an oil/water separator, granulated activated carbon units, bag or pressure filters and piping, valves, and instrumentation associated with the system. The storage of hydrogen peroxide and caustic (typically sodium hydroxide) in conjunction with operation of the water treatment plant is not considered to constitute a hazardous condition with regard to SCAQMD criteria for indirect air quality impacts.

Gaseous infiltration into the tunnel or stations may occur near the Pico/San Vicente Underground Station where the Lakewood formation is not always saturated. Higher concentration vapors may create a detectable odor. Odor reduction would occur through increasing the ventilation rate and/or by adsorption of odorant on activated charcoal filters. The creation of odors at levels considered offensive by people of normal sensitivity is a violation of SCAQMD rules. If odorous gas infiltration into the system occurs, control systems would be in place to maintain levels to a less than significant impact.

The movement of large volumes of air would require large fans which, in turn, would consume electricity on a continuing basis. Air pollutant emissions from this use of power is addressed below under Regional Power Plants.

- **Park-and-Ride**. Park-and-Ride emissions would include low-speed emissions from vehicles searching for ~~a~~ parking spaces, cold and hot start emissions[6], hot soak emissions from vehicles after parking,[7] and diurnal emissions while parked in the lot.[8] According to the traffic analysis prepared for the project, no trips would be generated on a daily basis at the Olympic/Arlington Station, and 2,145 trips would be generated on a daily basis (206 during both the AM and PM peak hours) at the Pico/ or Venice/San Vicente Station (Alternatives A and B, see Table 7-7). For Alternative C, no trips would be generated on a daily basis at the Olympic/Crenshaw Station, and 2,038 trips would be generated on a daily basis (195 during the AM and PM peak hours) at the Pico/San Vicente Station (see Table 7-8). Because a very large portion of a trip's emissions occur in the first 1-2 miles while vehicles are most pollution inefficient, use of park-and-ride to divert traffic to mass transit creates only limited air quality benefits as compared to leaving a vehicle at home and not driving at all. Any vehicular emissions impacts from park-and-ride activities are incorporated into the microscale and regional impact analyses for mobile source emissions. CO emissions from this element of the project are estimated in Table 7-56.

  Parking structures may experience elevated levels of air pollution in areas of poor ventilation and heavy vehicle traffic. Parking structures are not considered "ambient environments" for purposes of evaluating impact significance. In-structure air quality is evaluated relative to health and safety standards (OSHA) for lot attendants, security or other MTA personnel. The OSHA standard for CO as the principal vehicular

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6/ A cold start means starting a car that has not been operated in that last hour; a hot start means starting a car that has been operated in the last hour.

7/ Emissions from a car immediately after it has been turned-off.

8/ Emissions from a car that has not been operated in for more than an hour.

pollutant is 50 ppm for 8 hours compared to an ambient standard of 9 ppm for the same time period. The Building Code requires that a structure either be adequately naturally ventilated, or that supplemental ventilation be provided in any unventilated space. New construction requires installation of CO sensors that trigger the ventilation system when in-structure levels exceed certain thresholds. Code compliance would keep CO within the structure ~~maintain chronic worker exposure and temporary public exposure~~ at less than significant air pollution levels ~~within the structure~~. CO emissions from this element of the project are estimated in Table 7-56.

- **Kiss-and-Ride**. Kiss-and-Ride emissions would include idling and low-speed emissions from patron drop-offs and pick-ups. According to the traffic study for the project, approximately 700 trips would be generated on a daily basis (66 during the AM and PM peak hours) at the Olympic/Arlington Station, and 3,004 trips would be generated on a daily basis (288 during the AM and PM peak hours) at the Pico/ or Venice/San Vicente Station (Alternatives A and B, see Table 7-7). For Alternative C, approximately 1,332 trips would be generated on a daily basis (122 during the AM and PM peak hours) at the Olympic/ Crenshaw Station, and 2,852 trips would be generated on a daily basis (274 during the AM and PM peak hours) at the Pico/San Vicente Station (see Table 7-8). ~~Kiss-and-ride trips are less pollution efficient than even park-and-ride because they entail one "cold-start" trip at drop-off and another cold-start trip on pick-up.~~ Vehicular emissions impacts from these trips on a local and regional scale are included in the mobile source impact assessment. CO emissions from this element of the project are estimated in Table 7-56.

Table 7-56
Summary of Project Carbon Monoxide Emissions

Element	Emissions (pounds/day)		
	Alternative A	Alternative B	Alternative C
MTA Worker Commute[a]	3.4	3.4	3.4
Park-and-Ride	17.8	17.8	17.0
Kiss-and-Ride	30.8	30.8	34.8
Existing Uses[b]	-26.2	-26.2	-26.2
On-Site Bus Operations[a]	51.6	51.6	51.6
Regional Power Plant[a]	Negligible	Negligible	Negligible
TOTAL	77.4	77.4	80.6

a. Source: Enviro-rail, 1995.
b. Existing uses at the station sites would be displaced by the project.
Note: Significance threshold is 550 pounds/day; the impact for all alternatives is negligible.

- **Bus Service**. Bus emissions would include idling and low-speed emissions from bus operations through the stations. Alternatives A or B would generate 118 daily bus trips at the Olympic/Arlington Station with 489 trips at the Pico/ or Venice/San Vicente Station. Alternative C would have slightly fewer daily bus trips at the Olympic/Crenshaw Station, but identical daily volumes at the Pico/San Vicente Station. Bus emissions would create localized accumulations of air pollution near idling coaches, as well as contribute to the regional air pollution burden. Regional bus pollution differences for the No Project Alternative could not be reliably quantified because bus route projections for the year 2020 are not available at this time. Table 7-56 summarizes CO emissions for the Olympic/Arlington and Olympic/Crenshaw Stations (40 trips during evening peak hour), and for the Pico/ or Venice/San Vicente Stations (85 trips during evening peak hour).

The MTA is in the process of converting their bus fleet from diesel powered buses to other less polluting types of buses that are powered by cleaner burning fuels.

Emissions Impacts

Mobile Sources

Regional Emissions. Project implementation would reduce regional vehicular emissions by diverting traffic from low-occupancy~~, pollution-inefficient~~ automobiles to ~~efficient~~ mass transit. With continued improvement in vehicle emissions characteristics, and with anticipated strong market penetration of electric commuting vehicles in the first or second decades of the 21st Century, the air quality advantage of heavy rail mass transit would slowly disappear. Even as far out as 2020, however, it can be demonstrated that project implementation would cause a ~~significant~~ reduction in commuting activity emissions despite the improvement in commuting fleet emissions characteristics.

The project-related air pollution benefit was estimated by assuming that Park-and-Ride and Kiss-and-Ride trips to/from Mid-City stations would displace trips that normally would continue to downtown Los Angeles or some similarly distant destination. For bus arrivals, only a fraction of bus users would likely have driven their own vehicle. For bus arrivals/departures, it was assumed that forty (40) percent of bus patrons would have driven their cars under the No Project Alternative.

A large fraction of vehicular emissions occur in the first few miles of travel. Pollution "savings" by park-and-ride or kiss-and-ride users are therefore only from a reduction in their "hot stabilized" mode when cars are most efficient. The bulk of any project benefit thus derives mostly from those patrons who do not use their car at all. Travel reduction for various modes of station access/egress are shown on Table 7-57.

Although there are small ~~inter-alternative~~ differences between alternatives in trip and/or vehicle miles traveled (VMT) allocations, all alternatives would divert essentially identical amounts of travel. The regional emissions benefit was calculated by combining the predicted average "per mile" emissions from light duty autos in Los Angeles County for running and for total exhaust emissions with the VMT reductions above. Vehicular emissions data were derived from the EMFAC7G current California emissions computer model. The calculated air quality benefit is shown in Table 7-58.

Although there is a noticeable erosion in the project's regional air quality benefit from 2010 to 2020, the CO and NO_x savings even by 2020 continue to exceed the SCAQMD significance threshold. A significant regional pollution savings would thus accompany the proposed extension at least in the first ten years of project existence.

Microscale Impacts. Microscale air quality impacts would manifest themselves principally through those vehicular emissions that are released in their already most unhealthful form not requiring further chemical transformation. For vehicular exhaust, the one pollutant meeting this criterion is carbon monoxide (CO). Localized violations of CO standards near congested intersections or other traffic stagnation points are called "hot spots."

Potential hot spot formation has been steadily declining within the last decade, even around heavily congested intersections. Background CO levels throughout the basin have declined steadily as the airshed progresses towards

Table 7-57
Travel Reduction by Park-and-ride or Kiss-and-Ride Users

Alternative/Station	Cold Start Miles	Hot-Stabilized Miles
Alternatives A/B		
Olympic/Arlington	16,488	2,100
Pico/Venice/San Vicente	68,424	31,316
TOTAL	84,912	33,416
Alternative C		
Olympic/Crenshaw	13,422	3,996
Pico/San Vicente	68,576	29,772
TOTAL	82,008	33,768

Table 7-58
Project-related Mobile Source Emissions Reductions
(pounds/day)

Source	ROG	CO	NO_x	PM_{10}
Opening Year (2009)				
Alternative A/B				
Cold-Start	59.9	735.7	82.4	3.7
Engine Running	5.2	192.3	22.1	0.4
TOTAL	65.1	928.0	104.5	4.1
Alternative C				
Cold-Start	57.8	710.5	79.5	3.6
Engine Running	5.2	194.3	22.3	0.4
TOTAL	63.0	904.9	101.8	4.0
HORIZON YEAR (2020)				
Alternatives A/B				
Cold-Start	28.1	505.4	59.9	3.7
Engine Running	2.2	139.2	15.5	0.4
TOTAL	30.3	644.6	75.4	4.1
Alternative C				
Cold-Start	27.1	488.1	57.9	3.6
Engine Running	2.2	140.7	15.6	0.4
TOTAL	29.3	628.8	73.5	4.0
SCAQMD's Thresholds of Significance	55.0	550.0	55.0	150.0

attainment. Peak hour CO levels in downtown Los Angeles, for example, have declined by almost 50 percent since 1990, and are forecasted to continue to decline in the future. It takes progressively greater amounts of local CO contributions to combine with the background to violate standards. Concurrent with an improving background condition, CO emissions per individual vehicle are decreasing. By 2010, it will require three automobiles to generate as much CO as one vehicle in 1997. By 2020, each car will be four times cleaner than in 1997.

For existing traffic, a detailed computerized vehicular dispersion model called CALINE4 was run based upon specific lane geometrics, stopping distances, acceleration time and other intersection performance characteristics. For the year 2020, SCAQMD staff (S. Smith, 1997) concurred that the combination of declining background and improving vehicular emissions would likely obviate the need for a highly detailed modeling analysis. SCAQMD staff recommended use of a Caltrans screening procedure based upon CALINE4 to determine if explicit model runs were necessary.

Table 7-59 summarizes the microscale air quality impacts from project implementation. For existing conditions, the California one-hour standard of 20 ppm would be exceeded at 12 intersections with the less stringent federal standard of 35 ppm exceeded at two locations. The eight-hour state and federal CO standard would be exceeded for existing conditions at every intersection analyzed. For future (2020) conditions, the maximum theoretical one-hour CO exposure would be less than even the eight-hour standard by a considerable margin of safety. However, the proposed project's contribution (from project related station ingress/egress traffic) is no more than 0.3-0.4 ppm. Implementing any of the proposed "build" alternatives would have a minimal (non-significant) affect on microscale air quality impacts.

Stationary Source Emissions

Regional Power Plant Emissions. SCAQMD recommends including in the air emissions analysis the indirect emissions from regional power plants resulting from project-related use of electricity.

According to the energy analysis for MTA's rail system presented in Los Angeles Rail Rapid Transit Project (Southern California Rapid Transit District 1983), Year-2000 "No Project" conditions (i.e., no Metro Rail system) would generate regional energy demand of 552 trillion British thermal units (Btu), as compared to 550 trillion Btu for With-Project conditions. The With-Project scenario requires less combustion of fossil fuel than for the No Project Alternative. Power plant fuel combustion is much more efficient than in individual automobiles, and a substantial portion of basin electrical resources are outside the SCAB. The net air emissions from combined mobile plus stationary (power plant) sources are therefore still less with Metro Rail than without the transit project.

Water Treatment Plant (Alternatives A and C). Groundwater infiltration into tunnels and underground stations would be captured through a sump system and treated prior to discharge. Sulfur compounds (H_2S)would be oxidized and converted to elemental sulfur or to a non-volatile (HS) ion. VOCs may be stripped by treatment process and off-gas[9] from the water. Off-gas would be evacuated through an activated carbon filtration system. Spent carbon replacement would be on a schedule that exceeds the loading rate with an adequate margin of safety to accommodate seasonal fluctuations in system loading. Activated carbon adsorption of most air contaminants is 99+ percent. Atmospheric release of water treatment plant emissions as a basis for odor or other air contaminant impact from a properly engineered and maintained system is negligible.

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[9]/ Off-gas is gas released, usually in trace amounts, during the treatment process.

Table 7-59
Microscale Air Quality Impact Analysis
(CO Concentrations [ppm] on sidewalk adjacent to each roadway link)

Intersection	Existing		No Project	Alts A/B	Alt C
	1-Hr	8-Hr	Base	Future (2020)	Future (2020)
Crenshaw Blvd. @ Wilshire Blvd.	25.3	17.7	5.4	5.4	5.4
Arlington Ave./Wilton Pl. @ Wilshire Blvd.	—	—	5.5	5.5	5.5
Western Ave. @ Wilshire Blvd.	—	—	3.9	3.9	3.9
Crenshaw Blvd. @ 8th Street	23.4	16.3	3.9	3.9	3.9
Arlington Ave./Wilton Pl. @ 8th Street	—	—	4.7	4.7	4.7
Western Ave. @ 8th Street	—	—	3.9	3.9	3.9
Crenshaw Blvd. @ Olympic Blvd.	30.9	21.6	6.1	6.1	6.1
Arlington Ave./Wilton Pl. @ Olympic Blvd.	29.0	20.3	6.7	6.7	6.7
Western Ave. @ Olympic Blvd.	—	—	6.7	6.7	6.7
La Brea Ave. @ San Vicente Blvd.	31.3	21.9	5.5	5.5	5.5
La Brea Ave. @ Pico Blvd.	32.1	22.4	6.8	6.8	6.8
San Vicente Blvd. at Pico Blvd.	20.5	14.3	4.3	4.7	4.7
Rimpau Blvd. @ Pico Blvd.	20.2	14.0	5.2	5.2	5.2
Mullen Ave. @ Pico Blvd.	17.4	12.1	3.9	3.9	3.9
Muirfield Rd. @ Pico Blvd.	—	—	4.7	4.7	4.7
West Blvd. @ Pico Blvd.	17.2	12.0	5.2	5.2	5.2
Crenshaw Blvd. @ Pico Blvd.	34.4	24.0	5.5	5.5	5.5
Arlington Ave. @ Pico Blvd.	—	—	4.2	4.5	4.5
Western Ave. @ Pico Blvd.	—	—	4.5	4.5	4.5
La Brea Ave. @ Venice Blvd.	41.2	28.8	5.6	5.6	5.6
San Vicente Blvd./Vinyard Ave. @ Venice Blvd.	23.4	16.3	7.3	7.3	7.3
Crenshaw Blvd. @ Venice Blvd.	43.2	30.2	6.8	6.8	6.8

Source: Existing = CALINE4 Air Quality Model, Enviro-rail (1995). Future = Caltrans Air Quality Technical Analysis Notes (AQTAN, 1988) [CALINE4-based].

Ventilation Shafts (Alternative C only). The stations and tunnels would be ventilated via shafts located along the alignment. The ventilation shafts are proposed to be located on the northwestern corner of Victoria and Pico Boulevard and the southwest corner of Norton Avenue and Wilshire Boulevard. Ventilation air could include low concentrations of H_2S diffusing into the tunnels and stations from the surrounding subsurface. Project design features implemented to reduce potential H_2S concentrations in tunnels and stations would keep H_2S below the State's public health threshold of 0.03 ppm, but H_2S concentrations could occasionally exceed the odor detection threshold of 0.01 ppm. Vented air would contain essentially the same concentrations of H_2S as found in the tunnels and stations, so the project could occasionally generate odors in the vicinity of the vent structures (odors would be rapidly diluted in the ambient air to concentrations below the odor threshold). Because H_2S concentrations resulting from the air ventilation shafts would not be detectable for sustained periods and occasional odors from H_2S are not expected to occur regularly over a long period of time, significant odor impacts are not expected.

In saturated zones, H_2S would be trapped in ground water and would first need to convert to a gaseous state. The water treatment would strip H_2S or other odorous gases before they evolve into the air in any significant concentrations.

Gaseous infiltration into the tunnel or stations may occur near the Pico/San Vicente Underground Station where the Lakewood formation is not always saturated. Higher concentration vapors may create a detectable odor. Odor reduction would occur through increasing the ventilation rate and/or by adsorption of odorant on activated charcoal filters. The creation of odors at levels considered offensive by people of normal sensitivity is a violation of SCAQMD rules. If odorous gas infiltration into the system occurs, control systems would be in place to maintain a less than significant impact.

Odor (Alternatives A and C). Odor impact potential by virtue of alignment selection to avoid the San Pedro Formation or unsaturated sections of the Lakewood Formation is minimized. Although no adverse odor potential is anticipated, tunnel vent systems are designed to accommodate an add-on activated carbon adsorption system if subsurface gas migration patterns were to unexpectedly change in the future. Creation of an odor nuisance is expressly prohibited by SCAQMD Rule 402. If future geotechnical or geohydrological parameters were to change from their current design values, a simple and effective treatment system using standard proven technologies would be implemented to maintain compliance with air quality regulations.

Conformity and Consistency

No Project Alternative

Under the No Project Alternative, residents and workers in the project area would continue to travel primarily by bus or by private automobile. This situation would not further local or federal air pollution goals, which generally identify mass transit as a desirable alternative to the private automobile.

Alternatives A, B1, B2, and C

Federal Conformity Determination. Based upon conformity criteria promulgated by responsible agencies and implementation of the mitigation measures listed below, the Metro Red Line Mid-City Segment is in conformance with federal Clean Air Act requirements. Conformity with Section 176(c) of the Clean Air Act Amendments of 1990 is demonstrated as follows:

- The project is included in the current Regional Transportation Improvement Plan (RTIP), which has been found to conform with the Clean Air Act (November 1991). The USEPA conformity guidance (1993) requires that projects that are included in a conforming RTIP must not have changed design concept or scope since the RTIP from which they were derived was found to conform. The Metro Red Line Mid-City project definition is not expected to change with respect to its effects on local and regional transportation systems from the definition in the current RTIP. It therefore conforms with the federal Clean Air Act.

- The assumptions used in the traffic modeling and microscale carbon monoxide analysis are derived from SCAG's most recently adopted estimates of population, employment, travel, and congestion. Travel forecasts have been based on adopted growth assumptions for 2010 and interim forecasts to 2020.

- All emissions estimates are based upon EMFAC7G, the most recent version of CARB's emissions estimating model.

- SCAG is expected, as the Metropolitan Planning Organization (MPO) for Clean Air Act conformity, to make a positive conformity determination for the project.

- The Metro Red Line Mid-City Segment is included in the most recent RTIP, which has been found to conform with the federal Clean Air Act.

- The microscale carbon monoxide analysis demonstrates that the project would not cause or contribute to new violations of the federal carbon monoxide standards.

Air Quality Management Plan Consistency. Consistency is different from conformity; consistency is a CEQA requirement. Section 15125 of the State CEQA Guidelines requires EIRs to analyze and discuss any inconsistencies between a proposed project and applicable regional plans such as the AQMP. Inconsistency of a project with the AQMP could interfere with the region's ability to comply with federal and state air quality standards.

The Metro Red Line Mid-City project is found to be consistent with the AQMP because:

- It is consistent with SCAG's Regional Comprehensive Plan which relates to air quality and provides some of the input assumptions to the AQMP, and it would not cause exceedances of the assumptions in the AQMP for 2010;

- The air quality impacts of the project were analyzed as recommended in SCAQMD's 1993 Air Quality Handbook using standard methods, assumptions, and significance criteria;

- Mass transit is specifically mentioned in the AQMP as a "Transportation Control Measure;" and,

- With the incorporation of mitigation measures the project would not increase the frequency or severity of existing air quality violations, cause or contribute to new violations, or delay timely attainment of air quality standards or the interim reductions specified in the AQMP.

7.12.3 Cumulative Impacts

7.12.3.1 Construction

As indicated in the environmental setting section above, existing air quality in the SCAB is poor. Cumulative air pollutant impacts, region-wide, are presented in the future scenario discussed in SCAQMD's AQMP. Local cumulative impacts are reflected in the traffic volumes for the future base case; emissions from building demolition, site clearing, and architectural coatings are not included therein. Substantial efforts have been made by SCAQMD, SCAG, USEPA, and other agencies to achieve SAAQS and NAAQS in the near future. In this context, emissions of CO, ROC, NO_x, and PM_{10} from project construction would temporarily and incrementally add to air quality impacts from cumulative development planned for the project area. Because emission levels from construction activities would individually exceed significance thresholds, they are~~, by definition,~~ also cumulatively significant.

7.12.3.2 Operation and Maintenance

Cumulative air quality impacts comprise operational emissions from the project, plus emissions (principally from automobile travel) resulting from regional growth and planned major developments in the vicinity of the project. For this analysis, cumulative traffic projections were based on SCAG's assumptions and methodologies for 2010 projected to the year 2020, based on interim growth forecasts for post-2010 conditions. The Western Extension of the Red Line is not included in the patronage projections used to estimate traffic generation around station sites. The project's operational emissions of criteria air pollutants and TACs would be insignificant. Year 2020 emissions levels are expected to decrease relative to existing levels due to mandated improvements in vehicular efficiency. Thus regional cumulative air quality impacts would be insignificant.

7.12.4 Mitigation Measures

Construction

H_2S gas emissions during project construction would not exceed the State public health threshold of 0.03 ppm, but could occasionally exceed the odor detection threshold of 0.01 ppm. Project design features and other measures would be implemented to reduce potential odor impacts to the extent feasible. Each phase of project construction would temporarily generate significant amounts of criteria air pollutant emissions. The following measures, suggested in CEQA Air Quality Handbook (SCAQMD 1993), shall apply to each phase of construction and shall be implemented ~~where feasible~~ by MTA for the duration of construction to reduce criteria air pollutant emissions:

Criteria Air Pollutants

1. The MTA will require their contractors to schedule materials deliveries during off-peak traffic periods to avoid contributing to peak-hour traffic congestion. This measure would reduce emissions of criteria air pollutants by an unknown, but minor, amount.

~~2. The MTA will require their contractors to develop a trip reduction plan for construction workers to achieve an Average Vehicle Ridership of 1.5 individuals, if feasible. This measure would reduce emissions of ROC by about two percent, and emissions of other criteria air pollutants by about three percent.~~

2. The MTA will require their contractors to use electricity provided by temporary power poles, rather than operate diesel- or gasoline-powered generators at construction sites. This measure would reduce project emissions of ROC from this equipment by about 99 percent, of CO by about 98 percent, of NO_X by about 97 percent, and of PM_{10} by about 98 percent.

3. The MTA will require their contractors to use electric, methane, natural gas, or propane-powered construction equipment and vehicles, rather than gasoline- or diesel-powered equipment or vehicles, where feasible. The contractor will provide a list of equipment and vehicles to MTA that will use non-gasoline or diesel fuel. This measure would reduce project emissions of ROC from this equipment by about 54 percent, of CO by about 25 percent, and of PM_{10} by about 95 percent. This measure would increase emissions of NO_X by about 29 percent.

Reactive Organic Compounds

4. The MTA will require their contractors to use temporary traffic control (e.g., flag persons) where construction traffic accessing construction sites or construction staging sites have the potential to create

substantial traffic congestion or delays, where stipulated in the Worksite Trtaffic Control Plan (see Section 7.2, Traffic). This measure would reduce emissions of ROC by an unknown, but minor, amount.

~~6. The MTA will require their contractors to the extent consistent with community safety, route construction traffic on the less-congested streets in the local road network. This measure would reduce ROC emissions by an unknown, but small, amount. Depending upon the route selected, this measure could annoy local residents; routing plans shall be sensitive to such potential effects.~~

5. The MTA will require their contractors to prohibit trucks and equipment at construction sites and at construction staging sites from idling for more than two minutes when not in active use, when it is safe to do so. This measure would reduce emissions of ROC by an unknown, but minor, amount.

6. The MTA will require their contractors to suspend use of all ~~powered~~ construction equipment or construction vehicles during second-stage smog alerts. This measure would reduce emissions of ROC by an unknown, but minor, amount.

Nitrogen Oxides

7. The MTA will require their contractors to maintain construction vehicles and equipment in proper tune, and retard diesel engine timing. This measure would reduce NO_x emissions from construction vehicles and equipment by about five percent.

Particulates

8. The MTA will require their contractors to comply with SCAQMD's Rule 403, as revised, and choose from the following measures, among others, to control particulates:

   8a. ~~The MTA will require their~~ Contractors to suspend excavation, grading, or other particulate-generating activities when winds (peak 10-second gusts) exceed 25 miles per hour. This measure would reduce the amount of dust generated by wind erosion by an unknown, but substantial, amount.

   8b. ~~The MTA will require their~~ Contractors to cover dirt and sediment haul trucks~~, or leave a minimum of two feet of freeboard for uncovered truck loads~~. This measure would reduce the amount of dust generated by wind erosion by an unknown, but substantial, amount.

   8c. ~~The MTA will require their~~ Contractors to wet down active construction sites at least two times per day, and more if necessary. This measure would increase the average moisture content of loose soils being worked or disturbed on construction sites, reducing fugitive dust emissions from soil disturbance by about 50 percent.

   8d. ~~The MTA will require their~~ Contractors to apply approved chemical soil stabilizers according to manufacturers' specifications to all inactive construction sites (previously graded areas inactive for four days or more). This measure would reduce the amount of dust generated by wind erosion by about 30-65 percent.

   8e. ~~The MTA will require their~~ Contractors to replace ground cover in disturbed areas as quickly as possible. This measure would reduce the amount of dust generated by wind erosion by about 15-49 percent.

8f. ~~The MTA will require their~~ Contractors to enclose, cover, water twice daily, or apply approved soil binders according to manufacturers' specifications to exposed materials piles (i.e., sand, gravel, dirt). Excavated material will be transported off-site as soon as possible and properly disposed of. The height and bulk of excavated material will be controlled to minimize neighborhood impacts to the satisfaction of the MTA and the City of Los Angeles. This measure would reduce the amount of dust generated by wind erosion by about 30-74 percent.

9. ~~The MTA will require their~~ Contractors will sweep streets at the end of each work day, if visible soil material is carried over to adjacent roads. This measure would reduce PM_{10} emissions from loose soils by about 25-60 percent.

10. ~~The MTA will require their~~ Contractors will operate wheel washers in wet weather where vehicles enter and exit unpaved areas of construction sites onto paved roads. This measure would reduce PM_{10} emissions from vehicle wheels by about 40-70 percent.

11. ~~The MTA will require their~~ Contractors will apply water twice daily, or approved chemical soil stabilizers according to manufacturers' specifications, to all unpaved parking or staging sites, or unpaved road surfaces. This measure would reduce the amount of dust generated by wind erosion by about 45-85 percent.

12. ~~The MTA will require their~~ Contractors will maintain traffic speeds on all unpaved roads at 15 miles per hour or less. This measure would reduce PM_{10} emissions from off-road vehicle travel by about 40-70 percent.

13. ~~The MTA will require their~~ Contractors will pave construction roads that have a traffic volume of more than 50 daily trips by construction equipment, or more than 150 total daily trips for all vehicles. This measure would reduce PM_{10} emissions from off-road vehicle travel by 100 percent.

14. ~~The MTA will require their~~ Contractors will pave construction access roads at least 100 feet onto the site from the main road. This measure would reduce PM_{10} emissions from off-road vehicle travel by 100 percent.

~~21. The MTA will contract with a State-certified asbestos abatement contractor with the resposibility to would survey the buildings and remove the asbestos prior to demolition to the satisfaction of the MTA and the City of Los Angeles. This measure would reduce asbestos emissions from building demolition by 100 percent.~~

~~22. The MTA will consult with the LAUSD regarding additional measures beyond the requirements of Rule 403 to reduce construction-related particulate emissions at the station excavation sites (source) as well as effects in school classrooms or other interior facilities at the public school site (receptor) during the period of construction.~~

15. The MTA will consult with local homeowners associations regarding additional measures beyond the requirements of Rule 403 to reduce construction-related particulate emissions at the station excavation sites (source) as well as effects in their neighborhoods (receptor) during the period of construction.

16. The MTA will require their contractors to transport powder bentonite clay in bulk using pneumatic or enclosed trucks.

17. The MTA will require their contractors to use enclosed handling and storage; unload bentonite clay pneumatically or using enclosed conveyors and chutes, and enclose any stored or stock piled bentonite in structures or silo equipped with fabric filters.

18. The MTA will require their contractors to use a slurry batch plant with a mixer that is equipped with a pneumatic loader and a fabric filter or a mixer in an enclosed structure equipped with fabric filters at all ventilation openings.

Operation and Maintenance

19. **(Alternatives A and C).** The MTA will ensure project design features will be implemented to reduce potential effects of H_2S on sensitive receptors including:
    - ~~Location of the project alignment at an elevation above soils containing high concentrations of H_2S and the use of pre-venting and other treatments during project construction, as needed.~~
    - Standby or intermittent air injection will be installed prior to construction at station areas and sections of the tunnels where higher H_2S readings have historically been found.
    - Probe holes also will be tested ahead of tunnels; where probes indicate higher gas levels than predicted, additional measures will be taken such as activation of gas extraction, slowing construction advance, or increasing ventilation rates.
    - ~~If odors are detectable in significant amounts, use of the odor control measures noted above will be accelerated.~~

7.12.5 Unavoidable Significant Adverse Impacts

Construction

Although implementing the mitigation measures described above would reduce air quality impacts of CO, ROC, NO_X, and SO_X, project related emissions would remain an unavoidable significant adverse impact of constructing any of the ~~four~~ "build" alternatives.

Implementation of the mitigation measures described above would reduce PM_{10} impacts to a level of less than significant.

Operation

Under the No Project Alternative air quality benefits associated with reduced automobile travel would not be realized. ~~Future emissions levels are expected to decrease relative to existing levels due to mandated improvements in vehicular efficiency.~~ The loss of this benefit is not considered a significant adverse impact.

~~Under Alternatives A and C, potential impacts to sensitive receptors from H_2S odors could be a significant adverse impact of the project.~~

No unavoidable significant adverse air quality impacts would occur as a result of the Mid-City Red Line Extension to Pico/ or Venice/San Vicente for any of the ~~four~~ "build" alternatives analyzed.

7.13 UTILITIES

7.13.1 Environmental Setting

One of the first steps in the construction process is the relocation of utility lines which are in conflict with the proposed alignment. Utility lines located near, but not in direct conflict with, the alignment would remain during construction. Affected utilities include: a) storm drains, b) sanitary sewers, c) water lines, d) electrical cables, e) gas lines, and f) telephone lines near sites where tunneling and other construction activities would occur. The location of existing storm drains and sewer lines are displayed later in this section in Figures 7-34 through 7-39.

7.13.2 Project Impacts

7.13.2.1 Construction[1]

Potential utility impacts that would result from implementing any of the ~~four~~ "build" alternatives include disruption of service to users as well as impacts created by the construction process. Disruption of utility service impacts are not considered significant because they would be very short-term; that is, they would generally last less than one-half day. Utility service would only be disrupted when a relocated utility line (or drain) is physically connected to the original utility line. Once the connection is made, full service is restored. Accidental damage to functioning utility lines is also not considered a significant impact because great care is given to secure utility lines during construction activities to prevent such accidents, and if a utility line is accidentally damaged it is repaired immediately.

In the course of developing alignments and extension alternatives, various constraining factors were analyzed, among which was the presence of major utilities underlying crossing streets in the proposed Metro Red Line Mid-City Segment area. Conflicts to the alignments presented by major storm drains and sanitary sewers were investigated, and the engineering solutions to avoid extensive relocation of major storm drains and sewers were evaluated.

To relocate the sanitary sewers, which are smaller in diameter than the storm drains, generally a trench would be dug, the new sewers would be placed in the trenches, the trenches would be backfilled, and the street/ground surface restored. This would typically involve double lane closures within the affected streets. To minimize traffic disturbances, these trenches would be covered with steel plates when construction activity is not occurring.

The larger storm drain structures would involve cut-and-cover construction similar to the proposed subway tunnels. Street closures would be required while initial support, excavation, and decking activities occur. Once street decking is in place, construction of the utility lines would occur below ground and street disturbances would be minimized. All proposed improvements to storm drains and sewers would require the approval of the City of Los Angeles, Department of Public Works, Bureau of Engineering and the County of Los Angeles, Department of Public Works, Hydrologic and Water Conservation Division.

New storm drains and/or sewer lines would also be required beneath existing private properties. Construction of the relocated utilities using cut-and-cover methods would require acquisition of private properties along portions of the proposed relocation routes. For a discussion of property acquisition and displacement, refer to Section 7.6 within this document.

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[1]/ Refer to Table 4-1 for the construction schedule.

Other utilities that would need to be accommodated during construction include telephone lines, cable lines, water mains, and natural gas lines which are generally found within several feet of the street surface. These utilities would be temporarily removed from the cut-and-cover area and replaced in essentially their original locations during final backfilling above the shallow tunnels.

Another potential impact associated with utility removal and relocation/construction would be temporary disruptions in access to businesses and residences fronting along working utility easements. While construction activities would require the temporary closure of roadways and access points, these closures would be limited to working hours, with temporary access being restored at the end of the day. For a discussion of businesses that would be disrupted during utility relocation, refer to Section 7.7 within this document.

Following is a discussion of specific utility impacts for each of the five alternatives being analyzed.

No Project Alternative

No significant impacts to utilities would occur with the implementation of the No Project Alternative. However, it should be mentioned that several of the utility infrastructure relocations associated with the ~~four~~ "build" alternatives would replace aging existing utility infrastructure that ~~is in~~ needs to ~~of~~ ~~being~~ replaced ~~because they are very old and are not in the best of shape~~. In this sense, the No Project Alternative would put-off until some time in the future the identified ~~prevent some~~ necessary improvements to the utility systems ~~from being made~~.

Alternative A (Wilton/Arlington/Pico)

Alternative A would require that two storm drains and one sanitary sewer be relocated to allow for the Pico/San Vicente Underground Station and the twin-bore tunnels. Two storm drains, one in Pico Boulevard and one that crosses Pico Boulevard, and a sanitary sewer in Crenshaw Boulevard would have to be relocated. All three of the utility relocations would occur between Crenshaw and San Vicente Boulevards.

There is a major 11 foot x 9.5 foot double box storm drain currently crossing the Pico/San Vicente site. This storm drain extends in a southwest/northeast direction within the project area, and is owned, operated and maintained by the City of Los Angeles, Department of Public Works, Bureau of Engineering. This storm drain would conflict with the station box and would have to be rerouted. The existing storm drain would be abandoned between Queen Anne Place and a point immediately south of the Pico/San Vicente Underground Station. A new storm drain would intercept the existing storm drain at its intersection with Queen Anne Place. The new storm drain would be constructed underneath Queen Anne Place. The new storm drain would connect to the existing storm drain on-site immediately south of the Pico/San Vicente Underground Station. See Figures 7-34 and 7-34.1 for ~~a~~ graphic displays of this relocation. As shown in this figure, the relocation of this storm drain would occur mainly in Queen Anne Place. However, it would disrupt Pico Boulevard when it passes through it (see Section 7.2 for a discussion of this traffic impact), and it would require that the property on the southeast corner of Pico and West Boulevards be acquired (see Section 7.6 for a discussion of this acquisition). The existing storm drain would be abandoned in place between Queen Anne Place and the south side of Pico Boulevard where it would be sealed. That portion of the existing storm drain that would interfere with the construction of the underground station box would be removed. The length and size of the relocated storm drain includes:

- 3,000 feet of 11 foot x 9.5 foot double box storm drain (depth = 16 to 50 feet),
- 200 feet of 12 foot x 7 foot triple box storm drain (depth = 60 feet), and
- 1,400 feet of 12 foot x 10 foot double box storm drain (depth = 16 to 50 feet).

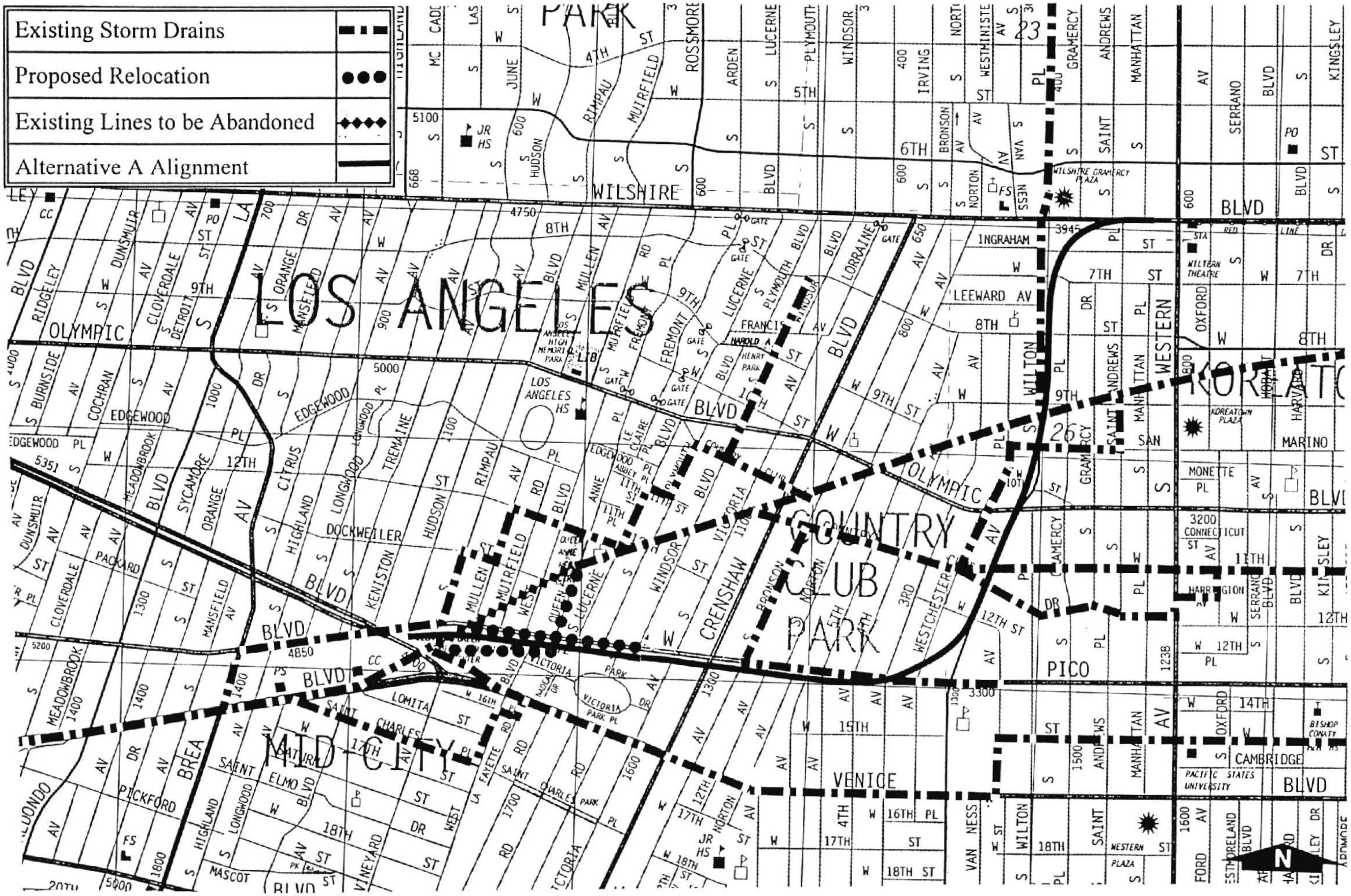

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FIGURE 7-34
STORM DRAIN RELOCATIONS - ALTERNATIVE A

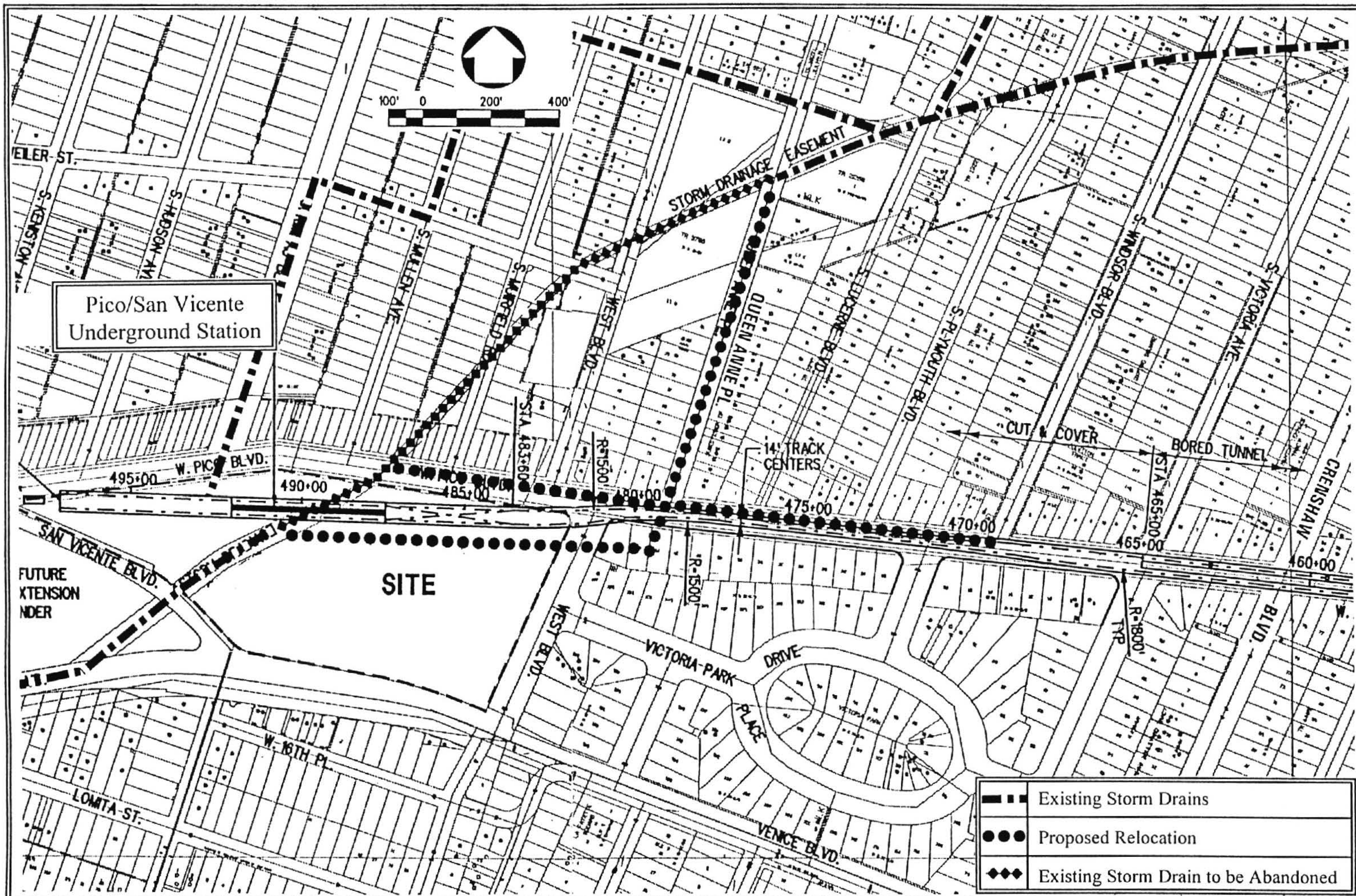

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FIGURE 7-34.1
STORM DRAIN RELOCATIONS AROUND THE PICO/SAN VICENTE STATION SITE - ALTERNATIVE A

The local storm drain that carries runoff from Pico Boulevard between Windsor Boulevard and Mullen Avenue would have to be relocated to make room for the twin concrete box tunnels that would be constructed by a cut-and-cover method within Pico Boulevard between the Pico/San Vicente Underground Station and Victoria Avenue. The length and size of the relocated storm drain includes:

- 800 feet of 36 inch storm drain (depth = 10 to 30 feet), and
- 1,000 feet of 27 inch storm drain (depth = 8 to 10 feet).

As excavation of the twin-bore tunnels begins to move in an easterly direction from Victoria Avenue the they would have to pass under a 42 inch sanitary sewer that runs in a north/south direction within Crenshaw Boulevard. This is a very old and potentially fragile brick sewer line that could potentially collapse when the tunnels are bored beneath it. To prevent collapse, this sewer would have to be replaced before the tunnels are bored beneath it. See Figure 7-35 for a display of the location of this sewer replacement. The length and size of the replaced sanitary sewer includes:

- 200 feet of 42 inch sanitary sewer within Crenshaw Boulevard (depth = 50 feet).

For the other utilities located along the Alternative A alignment that would not require relocation, the project would be designed to hold these utility lines in-place, securing them for the duration of construction. Refer to Section 4.0 of this document for a detailed discussion of utility support methods during project construction.

Major utility relocation would not be required for the construction of the Olympic/Arlington Station site.

Alternative B1 (Wilton/Arlington/Venice)

For Alternative B1, the existing 18 foot x 13.6 foot County major storm drain located underneath the north side of Venice Boulevard would be abandoned from Crenshaw Boulevard westerly to Fayette Road and would be replaced with a new, larger storm drain underneath the south side of Venice Boulevard. In addition, this alternative would require relocation and section modification of the existing 11 foot x 9.5 foot City of Los Angeles double box storm drain that currently crosses underneath the Venice/San Vicente Station site. Relocation of this storm drain would occur either within the street right-of-way or on the Venice/San Vicente Station site and would not require the acquisition of private property. That portion of the existing storm drain that would interfere with the construction of the open air lower elevation station would be removed. See Figures 7-36 and 7-36.1 for ~~a~~ displays of these relocations.

As in Alternative A, the twin-bore tunnels for Alternative B1 would be under the 42 inch sanitary sewer within Crenshaw Boulevard, and approximately 200 feet of this line would need to be replaced to prevent collapse. Replacement would occur during the initial stages of construction. For those utilities located along the Alternative B1 alignment that would not require relocation, the project would be designed to hold these utility lines in-place, securing them for the duration of construction. See Figure 7-37 for a display of the location of this sewer replacement. Refer to section 4.0 of this document for a detailed discussion of utility support methods during project construction. The summary of utility construction requirements for Alternative B1 is listed below:

- 200 feet of 42 inch sanitary sewer at Crenshaw Boulevard (depth = 50 feet),
- 1,500 feet of 18 foot x 13.6 foot storm drain along Venice Boulevard (depth = 25 feet)
- 800 feet of 33 inch storm drain (depth = 15 feet),
- 500 feet of 12 foot x 7 foot triple box storm drain (depth = 25 feet), and
- 1,000 feet of 11 foot x 9.5 foot double box storm drain (depth = 25 feet).
- ~~1,500 feet of 18 foot x 13.6 foot double box storm drain.~~

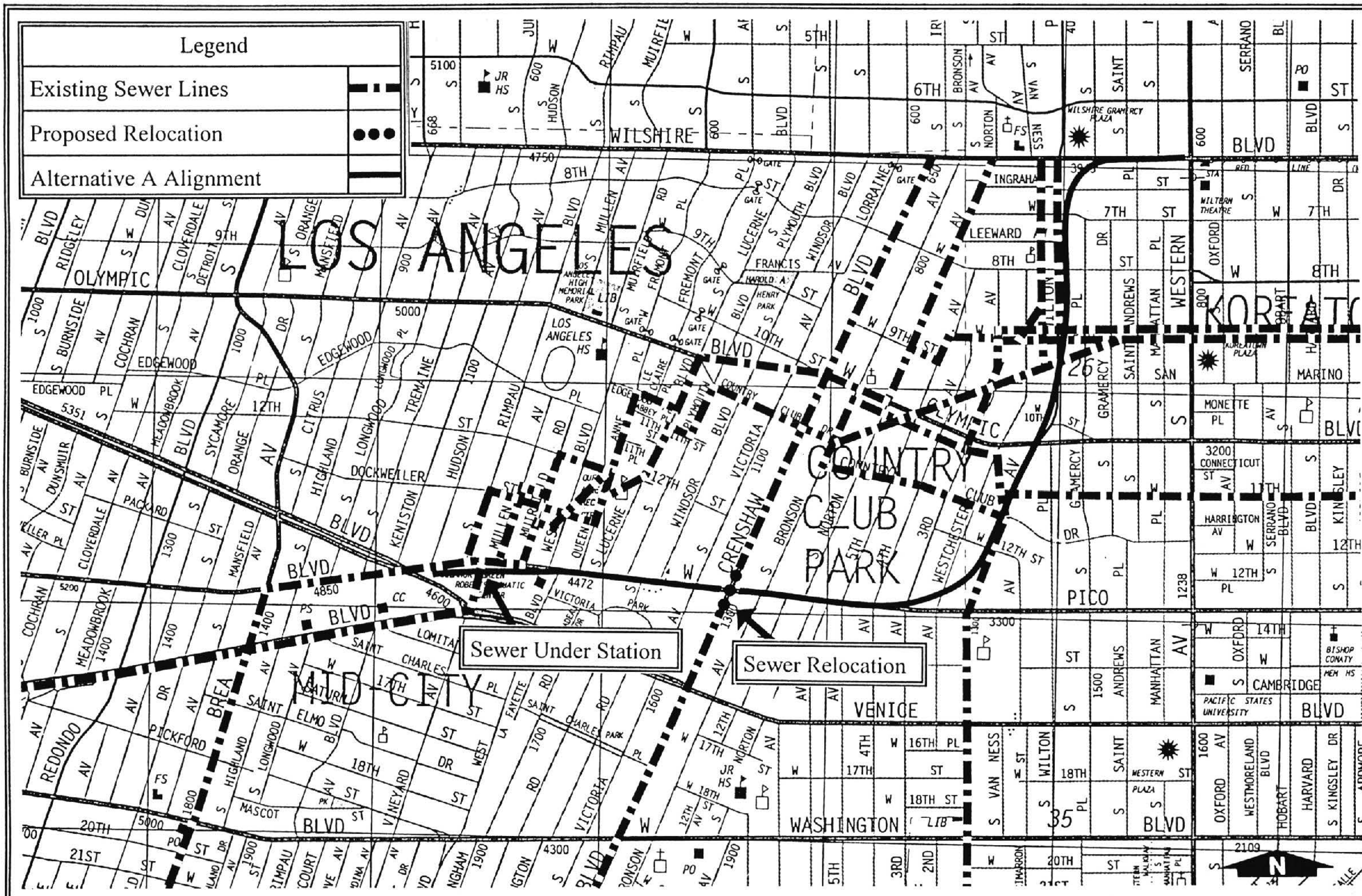

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FIGURE 7-35
SEWER LINE RELOCATIONS - ALTERNATIVE A

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FIGURE 7-36
SEWER LINE RELOCATIONS - ALTERNATIVES B1 & B2

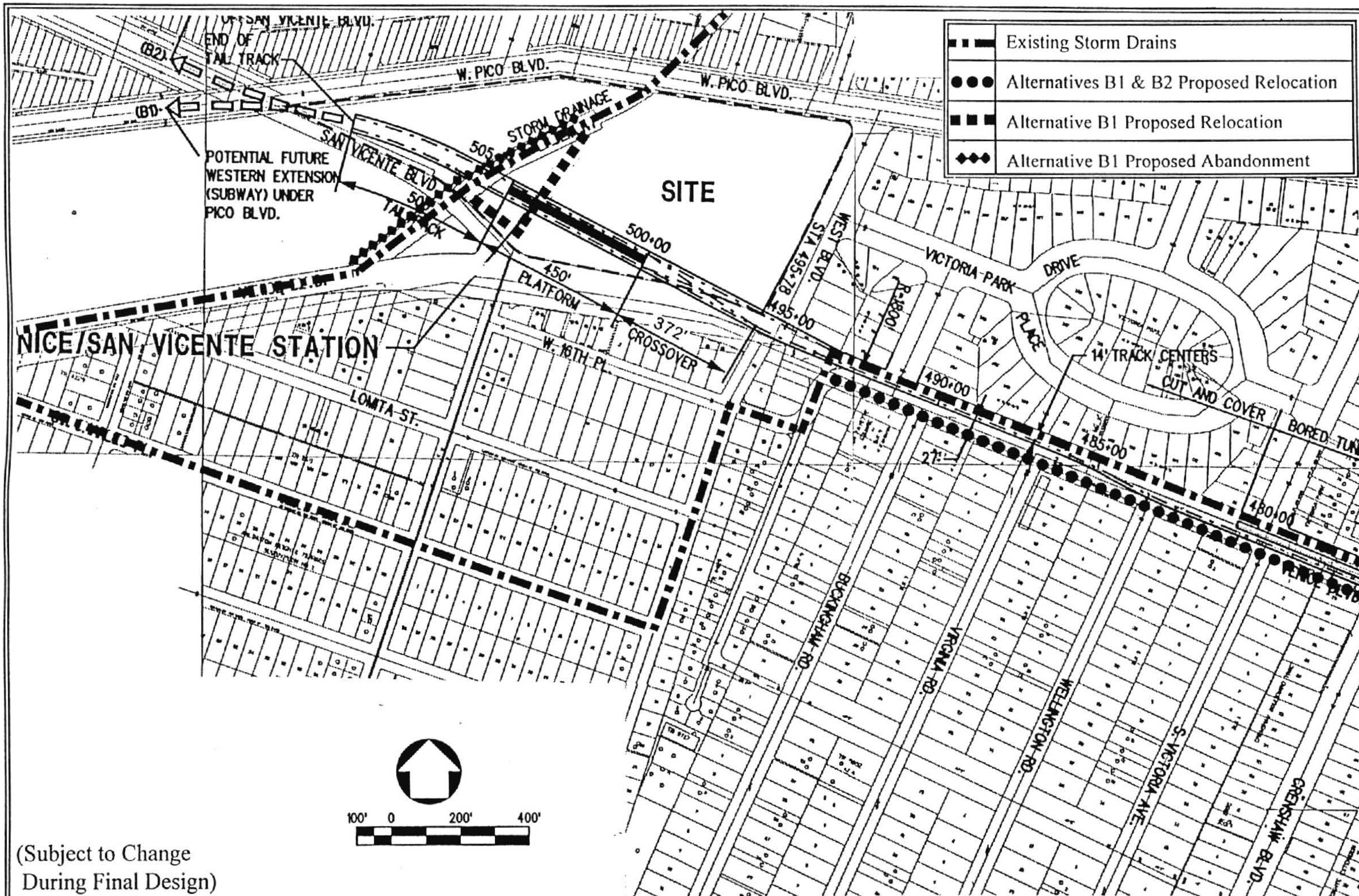

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FIGURE 7-36.1
STORM DRAIN RELOCATIONS AROUND THE VENICE/SAN VICENTE STATION SITE - ALTERNATIVES B1 & B2

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FIGURE 7-37
SEWER LINE RELOCATIONS - ALTERNATIVES B1 & B2

Major utility relocation would not be required for the construction of the Olympic/Arlington Station site.

Alternative B2 (Wilton/Arlington/Venice)

Impacts resulting from utility relocation for Alternative B2 would be the same as Alternative B1; however, the construction of an open air higher elevation station on the Venice/San Vicente site would not necessitate the relocation of the existing 11 foot by 9.5 foot City storm drain which currently crosses underneath the site.

Major utility relocation would not be required for the construction of the Olympic/Arlington Station site.

Alternative C (Crenshaw/Pico)

Alternative C would conflict with three major sanitary sewer lines, including:

- Wilshire-Hollywood interceptor sewer (WHIS),
- 51-inch sanitary sewer beneath Olympic Boulevard at Crenshaw Boulevard; and
- Wilshire Relief Sewer (WRS), a 45-inch sanitary sewer beneath Country Club Drive at Crenshaw Boulevard.

The shallow cut-and-cover section along Crenshaw Boulevard would conflict with ~~several~~ storm drains at Olympic Boulevard and Country Club Drive. As a prerequisite to construction of Alternative C, the storm drains that conflict with the area of the alignment would have to be relocated. This storm drain relocation effort would require:

- Construction of a 12 foot x 13 foot storm drain beginning west of 3rd Avenue ~~Westchester Place~~ and extending underneath 9th Street in a northwesterly direction until reaching Victoria Avenue.

- The 9th Street storm drain would link with another new 12 foot x 13 foot storm drain in Victoria Avenue that would ~~start underneath~~ run between 9th Street and Country Club Drive ~~extend north until connecting with the other new storm drain described above~~.

- A smaller storm drain segment would be constructed underneath Olympic Boulevard between Crenshaw Boulevard and Victoria Avenue.

- From the eastern terminus of the abandoned storm drain (described below), a new storm drain would be constructed underneath Bronson Avenue southerly of Country Club Drive to a point north of 12th Street. From here, this new storm drain would extend westerly as a 11 foot x 10 foot double box channel until linking with the existing City of Los Angeles 11 foot x 9.5 double box storm drain west of Victoria Avenue.

Alternative C would require the partial abandonment of a 12 foot x 15.6 foot County storm drain located underneath Country Club Drive, west of Bronson Avenue and east of Victoria Avenue. This storm drain is owned, operated and maintained by the County of Los Angeles, Department of Public Works, Hydrologic and Water Conservation Division. ~~From the eastern terminus of the abandoned storm drain, a new storm drain would be constructed underneath Bronson Avenue southerly of Country Club Drive to a point north of 12th Street. From here, this new storm drain would extend westerly as a 11 foot x 10 foot double box channel until linking with the existing City of Los Angeles 11 foot x 9.5 double box storm drain west of Victoria Avenue.~~

The proposed new storm drains would allow for increased queuing capacity over existing conditions. See Figure 7-38 for a graphic display of these storm drain relocations.

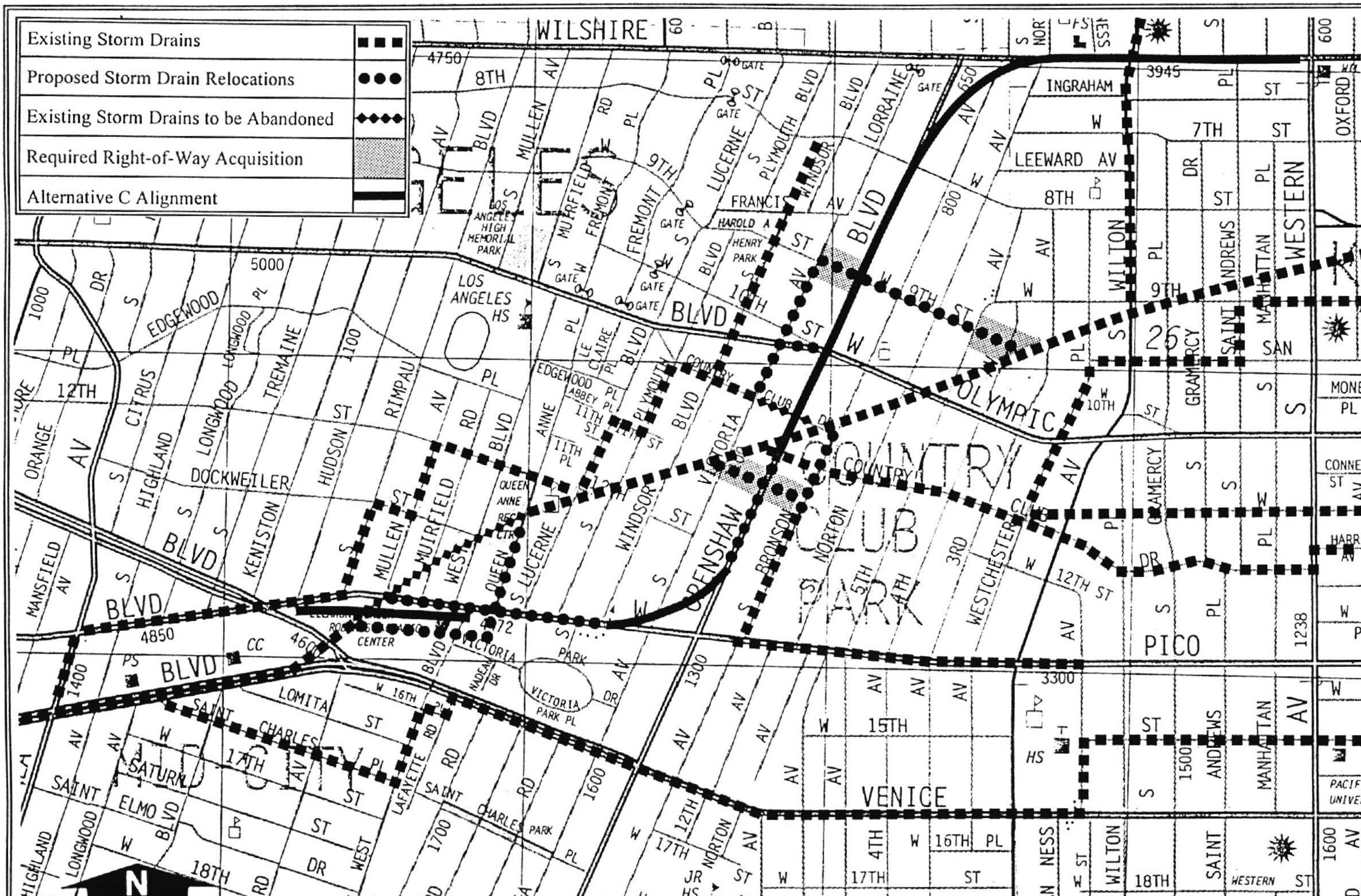

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FIGURE 7-38
STORM DRAIN RELOCATIONS - ALTERNATIVE C

Storm drain abandonment and relocation for the Pico/San Vicente Underground Station would be the same as described above for Alternative A.

Relocation of conflicting sanitary sewers ~~and/or storm drains~~ would involve construction of new sewers ~~and/or storm drains~~ within local streets, as well as several segments between these streets located on private property, including:

- Ninth Street between 5th Avenue and Crenshaw Boulevard;
- Victoria Avenue between Ninth Street and Country Club Drive;
- Bronson Avenue south of Country Club Drive;
- Crenshaw Boulevard between Country Club Drive and a point 1,100 feet south of Country Club Drive;
- Pico Boulevard between Windsor Boulevard and Mullen Avenue; and
- Queen Anne Place between the Queen Anne Recreation Center and Pico Boulevard.

See Figure 7-39 for a display of these sewer line relocations. Refer to Section 7.6 (Property Acquisition and Displacement) of this document for a discussion of specific private properties that would need to be acquired associated with utility relocation.

There is a high pressure 30 inch gas line that crosses Crenshaw Boulevard north of Olympic Boulevard. Cut and cover construction associated with the Olympic/Crenshaw Station may require the relocation of this gas line.

Access to businesses and residences along any of the above-mentioned streets could be temporarily blocked while construction activities were taking place. These closures would occur only as required, with access being reestablished as soon as possible. All working areas and open trenches would be covered and access restored during non-working hours.

Replacement would occur during the initial stages of construction. For those utilities located along the alignment that would not require relocation, the project shall be designed to hold these utility lines in-place, securing them for the duration of construction. Refer to Section 4.0 of this document for a detailed discussion of utility support methods during project construction.

7.13.2.2 Operation and Maintenance

No Project Alternative

The No Project Alternative would result in a significant impact to local infrastructure (e.g., sewers and storm drains) during the operation and maintenance phase of the project. The existing sewers and storm drains serving the project area are antiquated. Existing local storm drains do not provide sufficient storm water drainage capacity. Under the No Project Alternative, these systems would not be replaced and would continue to serve the project area in the long-term. The proposed project would replace portions of old sewers and storm drains with new sewers and storm drains. New infrastructure would more effectively accommodate local sewage flows and storm water drainage in the long-term.

Alternative A (Wilton/Arlington/Pico)

No significant impacts to utilities would occur during the operation of the proposed Metro Red Line Mid-City Segment.

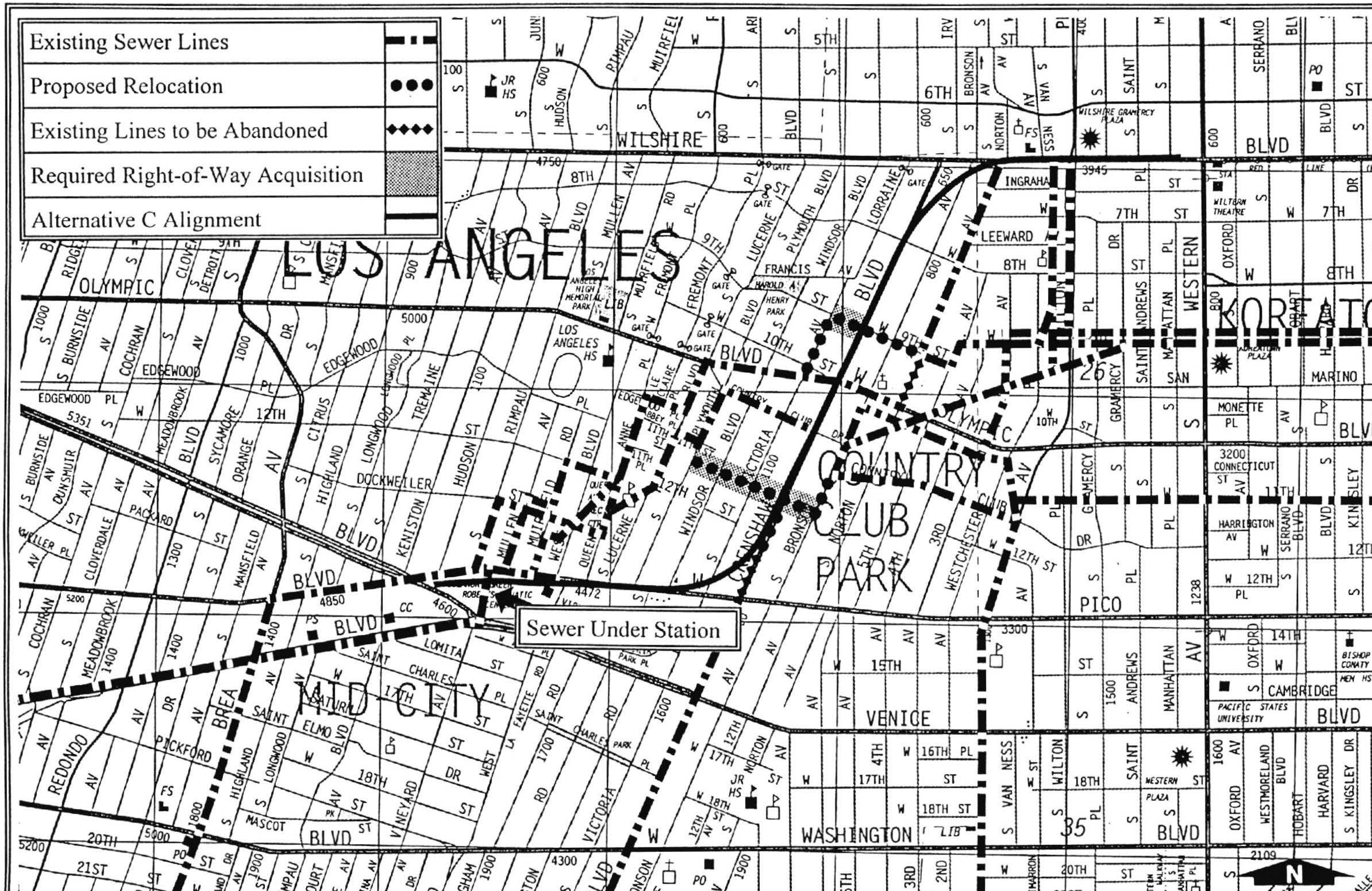

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FIGURE 7-39
SEWER LINE RELOCATIONS - ALTERNATIVE C

Alternative B1 (Wilton/Arlington/Venice)

No significant impacts to utilities would occur during the operation of the proposed Metro Red Line Mid-City Segment.

Alternative B2 (Wilton/Arlington/Venice)

No significant impacts to utilities would occur during the operation of the proposed Metro Red Line Mid-City Segment.

Alternative C (Crenshaw/Pico)

No significant impacts to utilities would occur during the operation of the proposed Metro Red Line Mid-City Segment.

7.13.3 Cumulative Impacts

7.13.3.1 Construction

No Project Alternative

No significant cumulative impacts would occur with the implementation of the No Project Alternative in conjunction with related project development. However, it should be mentioned that several of the utility infrastructure relocations associated with the ~~four~~ "build" alternatives would replace aging existing utility infrastructure that ~~is in~~ needs to ~~of being~~ replaced ~~because they are very old and not in the best of shape~~. It is also expected that any utility infrastructure relocations associated with cumulative projects would also be replacing utility infrastructure that is in need of replacement. In this sense, the No Project Alternative would put-off until some time in the future the identified ~~prevent some~~ necessary improvements to the utility systems ~~from being made~~.

Alternative A (Wilton/Arlington/Pico)

A future western extension of the Red Line from the Pico/San Vicente Underground Station would begin with a cut-and-cover segment within the Pico Boulevard right-of-way. This underground alignment option transitions from cut-and-cover to deep bored tunnels west of La Brea Avenue. There are storm drain and sanitary sewer conflict points at the intersection of Pico and Venice Boulevards and at La Brea Avenue. To accommodate a future Red Line Extension west beyond the Pico/San Vicente Station, it is anticipated that the following changes would have to be made to the existing infrastructure:

- The existing 42 inch sanitary sewer underneath Pico Boulevard would have to be relocated to the south side of Pico Boulevard until it could cross under the Pico/San Vicente Station and intercept the existing sanitary sewer alignment underneath Rimpau Boulevard.

- The existing 13.75 foot x 13 foot storm drain in Pico Boulevard that runs along the north side of the street west of San Vicente Boulevard would have to be relocated to the south side of Pico Boulevard at Highland Avenue ~~from~~ La Brea Avenue. ~~To cross over the cut-and-cover segment tunnel at Highland Avenue to the north side of Pico Boulevard, where it would intercept the existing storm drain alignment along Pico Boulevard at San Vicente Boulevard.~~

A summary of the utility construction requirements between ~~from~~ the intersections of Pico/San Vicente Boulevards and Pico Boulevard/La Brea Avenue for ~~along~~ this westward extension option is as follows:

- 2,500 feet of 42 inch sanitary sewer (depth = 10 to 20 feet),
- 2,500 feet of 13.75 foot x 13 foot storm drain (depth = 15 to 20 feet), and
- 300 feet of 12 foot x 7 foot triple box storm drain (depth = 25 feet).

Potential conflicts with utility infrastructure west of La Brea Avenue for this westward extension option ~~this point~~ has not been studied.

Alternative B1 (Wilton/Arlington/Venice)

A future western extension of the Red Line from the Venice/San Vicente Open Air (Lower Elevation) Station would begin with a cut-and-cover segment within the Pico Boulevard right-of-way at its intersection with San Vicente Boulevard. This underground option transitions from cut-and-cover to deep bored tunnels west of La Brea Avenue. The storm drain and sanitary sewer conflicts are the same as those described for Alternative A.

Alternative B2 (Wilton/Arlington/Venice)

A future western extension of the Red Line from the Venice/San Vicente Open Air (Higher Elevation) Station would begin with an aerial configuration along the median within the San Vicente Boulevard right-of-way. The aerial configuration continues in a northwest direction along San Vicente Boulevard until just west of La Brea Avenue, where it would transition to twin-bored tunnels under the San Vicente Boulevard right-of-way. Storm drain and sanitary sewer conflict points and associated utility construction and relocation that would occur at the intersections of Pico and San Vicente Boulevards and at La Brea Avenue, associated with Alternatives A, B1, and C would be avoided with an aerial alignment west of the Venice/San Vicente Open Air (Higher Elevation) Station.

Alternative C (Crenshaw/Pico)

Cumulative impacts associated with a westward extension of this alternative would be the same as Alternatives A and B1.

7.13.3.2 Operation and Maintenance

No Project Alternative

Cumulative impacts to utilities would not occur with the implementation of the No Project Alternative in conjunction with related project development.

Alternative A (Wilton/Arlington/Pico)

Cumulative impacts to utilities would not occur during the operation of the proposed Metro Red Line Mid-City Segment in combination with related project development. No significant impacts to existing service providers are anticipated during the long-term operation of the proposed project.

Alternative B1 (Wilton/Arlington/Venice)

Cumulative impacts are the same as Alternative A.

Alternative B2 (Wilton/Arlington/Venice)

Cumulative impacts are the same as Alternative A.

Alternative C (Crenshaw/Pico)

Cumulative impacts are the same as Alternative A.

7.13.4 Mitigation Measures

This section discusses the steps that MTA will take prior to and during construction of the Metro Red Line Mid-City Segment to minimize the inconvenience to businesses and residents resulting from temporary street closures and to avoid unanticipated conflicts with utility lines. Also described below are measures that will be taken to assure that any existing leaks in utility lines near the proposed construction area are discovered and remedied prior to construction. Early detection steps include (1) identification of existing utilities in order to prevent unanticipated conflicts and (2) identification and repair of potential leaks that could affect construction of the project.

Commercial/Residential Access

1. The MTA or their contractor will provide 30-day prior notice, including the anticipated dates and times of street/access closures, to all effected properties that front onto or otherwise have access from the streets that will be temporarily closed or otherwise impeded by construction activities. The MTA or their contractor will restore access to all properties during non-working hours.

Early Detection

2. Early in the construction design phase MTA or their contractor will ~~take is~~ coordinate with utility providers. Additionally, affected utility providers will be consulted during the construction phases to minimize interruption in service. Detailed construction plans will be given to utility providers by MTA or their contractor for review and comment. These plans, along with drawings of existing surface and subsurface utilities or structures, will be reviewed with the utility companies to ensure that all potential impacts of subway construction have been identified. Necessary arrangements such as early relocation or utility abandonment will be made. MTA will execute a cooperative agreement with each utility provider prior to construction.

3. After input from the utility providers is obtained and prior to excavation, MTA or their contractor will arrange an investigation of the condition of utilities and will test for existing leaks. All valves and shut-offs will be located and tested; fire hydrants, fire lines, and water utilities larger than a few inches in diameter will be checked for leaks; and for large lines, connections at buildings will be exposed and tested for leaks. Depending on the likelihood of leaks, MTA or their contractor will require development of a sampling program to uncover and analyze potential breaks in service pipes. If required, a sampling program will include digging test pits along the alignment to expose and investigate existing conditions of water service for several buildings in each block along the alignment. If faulty water services were discovered, repair and exploration of services in additional buildings could be required. The MTA or their contractor will be responsible for scheduling all utility company work and for requiring an inspector to document all work performed by utility companies, the MTA or the MTA contractors.

4. As excavation begins, MTA or their contractor will continue to monitor utility conditions. Any leaks that were repaired prior to tunneling will be monitored and the location and condition of utilities ahead of

tunneling will be verified. MTA or their contractor will use soundings to detect leaks and an inspector will be required to document the status of leaks on a regular basis.

Emergency Response

5. The intent of the above measures is to lessen the potential for utility disruption during construction. However, because the risk of utility disruption cannot be completely eliminated, MTA has developed an emergency response plan to assure a quick response and repair of a disrupted utility line. The core of the MTA's emergency response plan is to work closely with ~~require~~ utility companies and to keep them informed of MTA construction activities. If a leak or other infrastructure problems arise at an MTA construction site, the MTA or their contractors will notify the effected utility as soon as possible (no longer than one-hour). ~~stand by "on call" 24 hours per day during construction activities that could affect utilities. Utility crews will be able to respond to leaks within one hour of an emergency.~~

7.13.5 Unavoidable Significant Adverse Impacts

No unavoidable significant adverse impacts to utilities are anticipated after the implementation of mitigation measures.

7.14 SURFACE WATER QUALITY

7.14.1 Environmental Setting

Hydrology

Local Surface Water Bodies

The project area is located about 10 miles east of Santa Monica Bay on the Pacific Ocean, which is the ultimate receiving water body in the region. No other surface water bodies are located near the project area. Santa Monica Bay is recognized by the United States Congress and the State of California as a natural resource of national significance that must be preserved and protected under the National Estuary Program. Santa Monica Bay is a navigable water of the U.S., and is listed as an impaired water body in the federal lists established under the Clean Water Act, Sections 131.11, 303, 304, and 319. The project area is located within the Los Angeles-San Gabriel Hydrologic Unit and more specifically falls within the Ballona Creek Watershed Management Area. Beneficial uses of Ballona Creek include:

- Contact and non-contact water recreation;
- Warm fresh water habitat;
- Wildlife habitat;
- Preservation of rare and endangered species;
- Marine habitat;
- Ocean, commercial, and sport fishing; and
- Saline water habitat.

Local Drainage Patterns

The surface of the project area is substantially impervious (paved), thus the infiltration of surface water into groundwater is currently negligible. Along Crenshaw Boulevard, storm waters flow southwesterly from Wilshire Boulevard and northeasterly from Pico Boulevard towards Country Club Drive. Two storm drains (as shown in Figure 7-35) ~~to the south of the proposed Olympic/Crenshaw Underground Station site, and north and south of the proposed Olympic/Arlington Underground Station site,~~ collect and convey runoff from the Mid-City area to Ballona Creek. The northern most ~~former~~ storm drain is maintained by the Los Angeles County Department of Public Works, Hydrologic and Water Conservation Division; and the southern most storm ~~latter~~ drain is maintained by the City of Los Angeles Department of Public Works, Bureau of Engineering. 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, which is below the 10-year capacity considered by the County to constitute a basic level of flood protection.[1] The

[1]/ John Huang, Los Angeles County Department of Public Works, Flood Control Division, telephone conversation, June 15, 1995.

City storm drain located in the Mid-City area is estimated to provide at least a 10-year level of flood protection.[2] These two storm drains converge into a double 11 foot x 9.5 foot box storm drain crossing the Pico/ or Venice/San Vicente Station site. Other facilities in the project vicinity include storm drains along portions of Windsor Boulevard and Bronson Avenue. In addition, there is an existing 18 foot x 13.6 foot storm drain along Venice Boulevard.

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 in Ballona Creek originate from many sources, including point-source discharges from industrial facilities and storm water. In addition, miscellaneous activities occurring in urban areas produce other minor non-storm water flows, including landscape irrigation runoff, residential car washing, fire-fighting, water line flushing, swimming pool draining, ground dewatering at construction sites, and miscellaneous materials from illegal dumping.

The Federal Emergency Management Agency (FEMA) has prepared flood maps which identify areas in Los Angeles County which would be subject to flooding during 100-year and 500-year storm events. These maps indicate that a portion of the project area would be located inside of these identified flood zones. Figure 7-39.1 shows the 100-year and 500-year flood hazard zone in the Mid-City area.

Existing Water Quality

The *Water Quality Control Plan, Los Angeles Region (Basin Plan)*, prepared by the California Regional Water Quality Control Board, Los Angeles Region (RWQCB), notes that the major contributors to impaired water quality in Ballona Creek are pollutants from industrial and municipal effluent, and urban (non-point) runoff. In addition, untreated sewage overflows discharged into ~~the~~ 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. When it rains ~~During rain events~~, these contaminants enter municipal storm drains, which convey the contaminants to surface waters. In addition, high concentrations of DDT in sediments at the mouth of the creek and in Marina Del Rey provide evidence of past discharges that have resulted in long-term water quality problems.[3] Regulations for controlling storm water discharge in conjunction with regulations for ensuring water quality are discussed below.

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 the base flow waters in Ballona Creek is largely 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 that are located near the project area are located along Ballona Creek at Fairfax Avenue and Sawtelle Boulevard. The Fairfax station collects dry weather flow samples

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[2]/ Jim Corralejo, City of Los Angeles Department of Public Works, Bureau of Engineering, Central District, telephone conversation, June 26, 1995.

[3]/ *Water Quality Control Plan, Los Angeles Region: Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties*, p. 1-18, June 1994.

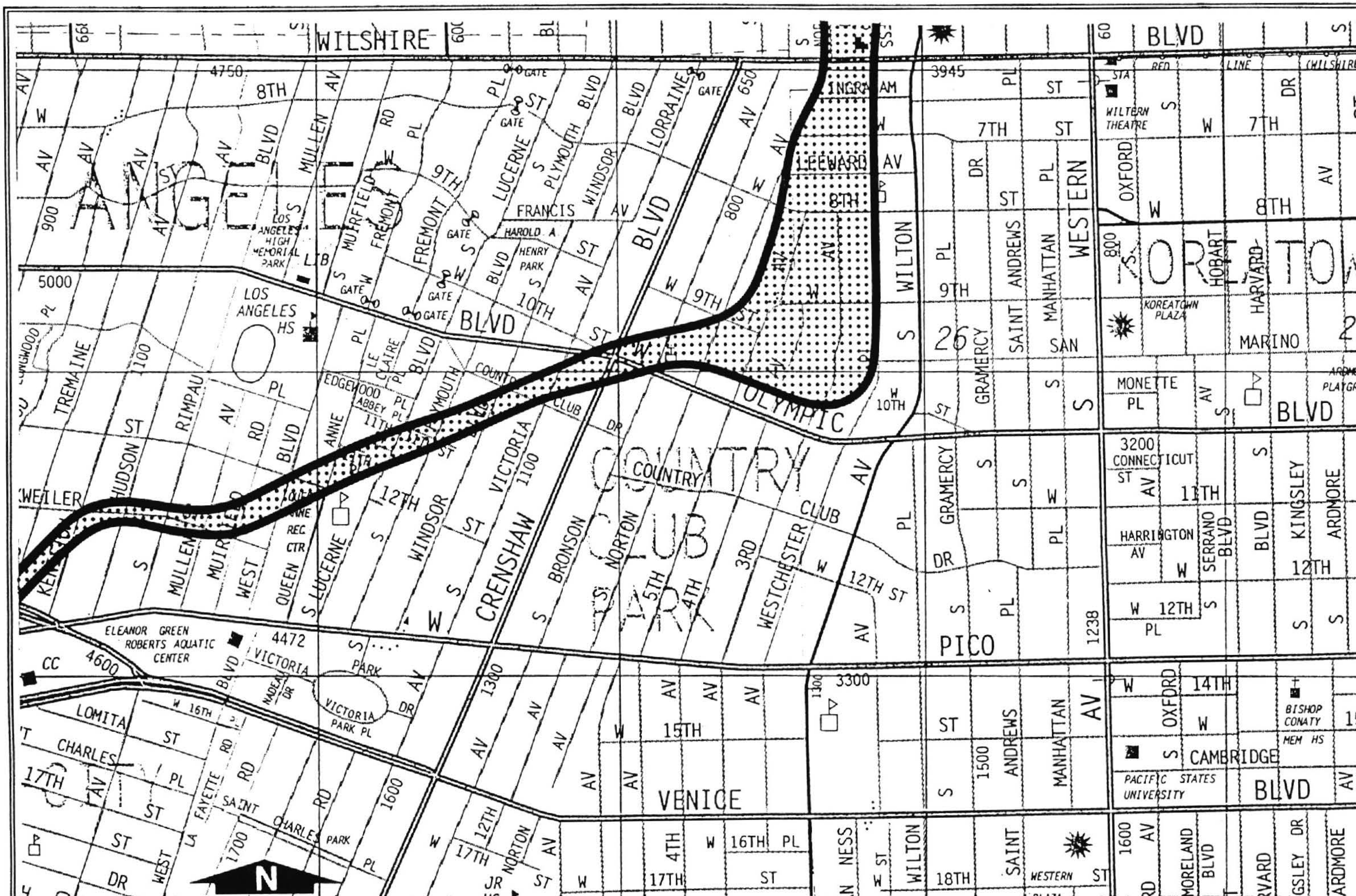

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FIGURE 7-39.1
FLOOD HAZARD ZONE IN THE MID-CITY AREA

only; the Sawtelle station collects dry weather and storm flow samples.[4] Storm water in Ballona Creek presently 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.[5]

The water quality data for storm flows from the Sawtelle station do not indicate a clear trend in mineral concentrations over the past few years; however, some bacteria concentrations have generally increased. 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 stations' dry weather flows 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 amendments to the Clean Water Act added Section 402(p) which require the U.S. Environmental Protection Agency (EPA) to develop regulations for the control of nonpoint 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. 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

The federal storm water regulations require municipalities to obtain NPDES permits for storm water discharges from municipal storm drains to surface waters. In 1990, 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

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4/ Mert Ramos, Los Angeles County Department of Public Works, Flood Control Division, telephone conversation, May 16, 1995.

5/ Carlos Urrunaga, California Regional Water Quality Control Board, Los Angeles Region, Stormwater Unit, telephone conversation, June 6, 1995.

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 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 (i.e., General Industrial Permit and General Construction Permit) are a major attempt to control nonpoint[6] source pollutants in urban runoff that discharges to the local storm drain system and into receiving waters, including Ballona Creek.

State

Porter-Cologne Act

The Porter-Cologne Water Quality Control Act of 1969 (Act) established the principal California program for water quality control. This Act authorizes the State Water Resources Control Board to implement the provisions of the federal Clean Water Act. The Act divided 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 State Water Resources Control Board. The project area is located in RWQCB Region 4.

Regional

Basin Plan

Under the Clean Water Act, the State was originally required to develop comprehensive drainage 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* guides conservation and enhancement of water resources in Region 4. The *Basin Plan* also establishes beneficial uses of inland surface waters, tidal prisms, harbors, and groundwater basins within this area.

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 project.

6/ An example of nonpoint source pollutants is oil that leaks from a car and drips to the road surface.

7.14.2 Project Impacts

Thresholds of Significance Criteria

~~Although the *NEPA Guidelines* do not contain significance thresholds, under~~ The *State CEQA Guidelines*, in Appendix G, states that a ~~the~~ project would create a significant impact to surface water quality if it would substantially degrade water quality or contaminate a public water supply.[7]

The proposed project would create a significant surface water quality effect if it were to discharge water that did not meet ~~would be significant if~~ water quality standards and effluent limitations ~~were exceeded~~ such that beneficial uses of Ballona Creek (the receiving waters) would be ~~were~~ adversely affected. The beneficial uses of Ballona Creek include, but are not limited to, water used for drinking water supply.[8]

~~Although the *NEPA Guidelines* do not contain significance thresholds, under~~ The *State CEQA Guidelines*, in Appendix G, states that a ~~the~~ project would create a significant impact to storm water runoff if it would cause substantial flooding, erosion or siltation.[9]

The proposed project would create a significant hydrology and storm water drainage effect if it were to allow ~~would be significant if~~ construction storm water runoff ~~were~~ to exceed the drainage and flood control capacity of the municipal storm drain system. Quantitative significance thresholds from storm water runoff have not been established by the City of Los Angeles; however, the City's proposed Thresholds Manual would evaluate runoff based on a 50-year frequency storm.[10] If the municipal storm drain system could not accommodate the estimated increase in surface flow and the project did not propose to increase the storm drain system's capacity, then project effects on surface hydrology would be significant.

Surface Water Quality

No Project Alternative

No significant impacts to surface water quality are anticipated with the implementation of the No Project Alternative.

Alternative A (Wilton/Arlington/Pico)

The MTA would apply for a NPDES permit prior to the start of construction. The NPDES would require each construction site to implement a Storm Water Pollution Prevention Plan (SWPPP) to control sediment and other construction-related pollutants from entering the storm drain system. This permit would list receiving water quality

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7/ *State CEQA Guidelines*, Appendix G, p. 284, August 1986.

8/ Op. Cit., *Water Quality Control Plan, Los Angeles Region: Basin Plan fr the Coastal Watersheds of Los Angeles and Ventura Counties*, p. 2-10.

9/ Op. Cit., *State CEQA Guidelines*, Appendix G, p. 284.

10/ Hadar Plafkin, City of Los Angeles Department of City Planning, Environmental Review Section, telephone conversation, May 30, 1995.

standards and effluent limits set forth by the Regional Water Quality Control Board (RWQCB) to protect the beneficial uses of Ballona Creek.

Alternative A would utilize ~~include~~ water treatment systems during construction at both the Olympic/Arlington Underground Station site and the Pico/San Vicente Underground Station site. The water treatment systems would treat collected surface, ~~and~~ ground ~~water as well as~~ and construction cleaning water[11]~~, as required by NPDES permitting~~ prior to discharge into storm drains that empty into Ballona Creek. The treated water (effluent) would be regulated by the RWQCB under MTA's NPDES Permit for the project. Contaminants typically found in storm water runoff include runoff from roads, industrial land uses, and landscaped areas.

Treated water associated with construction activities could also ~~would then~~ be released to the sewer system. Discharge to the City municipal sewer would require an Industrial Wastewater Permit from the City of Los Angeles, Department of Public Works, Bureau of Sanitation, Industrial Waste Management Division. ~~Water treatment would occur during the construction phase of the project.~~ The water treatment system is more thoroughly described in Section 7.15 within this document. ~~The treated water (effluent) would be regulated by RWQCB under MTA's NPDES Permit for the project.~~

The water treatment systems would remove contaminants to a level which meets either the ~~RWQCB's effluent limitations and monitoring~~ NPDES Permit or the Industrial Wastewater Permit requirements. Since construction surface water would be treated prior to ~~and then~~ release to storm drains or the City sewer system, no impacts to the beneficial uses of Ballona Creek are anticipated, and the project's anticipated effects on surface water quality would be less than significant.

Cut-and-cover construction for Alternative A would generate substantial levels of sediment, dust, and other construction-related pollutants, such as building materials~~, litter,~~ and debris. Sources of sediment and dust would include cut-and-cover activities and construction employee parking areas. To reduce these effects to a level of insignificance, MTA would be required to comply with the NPDES Construction Permit. Storm water quality would be monitored to assess the effectiveness of the Best Management Practices (BMPs) employed. In addition, as part of the Construction Permit requirements, annual monitoring reports would be submitted by MTA or their contractor to the RWQCB. With implementation of these BMPs, potential water quality impacts would be less than significant.

During the operational phase of Alternative A, the project would be operated under a General Industrial Permit that has the same discharge requirements as the Construction Permit.

Alternatives B1 and B2 (Wilton/Arlington/Venice)

The potential impacts to surface water quality under Alternative B1 or Alternative B2 would be the same as Alternative A. The same measures would be implemented to ensure that there would be no significant impacts to local or regional surface water quality. Implementation of Alternative B1 or Alternative B2 would include water treatment systems at both the Olympic/Arlington Underground Station site and the Venice/San Vicente Open Air Station site. Since construction surface water would be treated and then released to the City sewer system, no impacts to the beneficial uses of Ballona Creek are anticipated.

[11]/ An example of construction cleaning water is the water used to wash dirt off of haul trucks.

Alternative C (Crenshaw/Pico)

The potential impacts to surface water quality under Alternative C would be the same as Alternatives A and B only they would occur in greater quantities since there would be significantly more cut-and-cover construction for Alternative C along Crenshaw Boulevard. The same measures would be implemented to ensure that there would be no significant impacts to local or regional surface water quality. Implementation of Alternative C would include water treatment systems at both the Olympic/Crenshaw Underground Station site and the Pico/San Vicente Underground Station site. Since construction surface water would be treated and then released to the City sewer system, no impacts to the beneficial uses of Ballona Creek are anticipated.

Storm Water Runoff

No Project Alternative

The No Project Alternative would result in an impact to storm water drainage capacity. The existing storm water drainage system serving the project area is antiquated and does not provide sufficient storm water drainage capacity. Each of the "build" alternatives would replace antiquated storm water drainage systems, and construct new storm drains resulting in new infrastructure with increased queuing capacity to more effectively accommodate local storm water drainage.

Alternative A (Wilton/Arlington/Pico)

Construction of Alternative A, including cut-and-cover, deep-bore tunneling, and station construction for the proposed alignment would require the abandonment of several existing storm drains and the construction of new storm drains (the locations of which are described above in Section 7.13)~~ in different locations~~. The new storm drains would have a larger receiving capacity for the collection of storm water runoff than the existing storm drains. The new storm drains would be constructed using cut-and-cover techniques, which would generate substantial levels of sediment, dust, and other construction-related pollutants. No significant impacts to local and regional storm drain systems are anticipated during project construction. Drainage patterns would not be substantially altered; drainage in the project area would continue to drain into Ballona Creek upon the completion of the new storm drains. No disruption in storm water service capacity would occur. Refer to Section 7.13 of this document for a more thorough discussion of affected storm drains and the mitigation measures that would be employed during project construction to ensure that there would be no disruption in storm drain service or receiving capacity. The storm drain relocation plan described in Section 7.13 would meet the applicable storm drain capacity requirements of the County and City of Los Angeles. Operation of Alternative A would not add to existing areas of impervious surfaces and would not increase the amount of runoff. Thus, the effects of the implementation of Alternative A on current drainage patterns, storm water collection and service would be less than significant.

The project alignment is located within both 100-year and 500-year FEMA designated flood zone areas. During the operation of the Mid-City Segment, flooding impacts on MTA facilities could occur if proper safeguards are not implemented. MTA would implement a flood emergency response plan for the Mid-City Segment area, to reduce this potential impact to a less than significant level.

Alternatives B1 and B2 (Wilton/Arlington/Venice)

Impacts associated with storm water runoff and flooding would be similar to Alternative A. No significant impacts to storm water facility capacity during the construction and operation of either Alternative B1 or B2 are anticipated. In addition, with the implementation of mitigation measures described in Section 7.13 of this document, no significant impacts to storm drains or storm drain service, capacity, or flow are anticipated.

Alternative C (Crenshaw/Pico)

Impacts associated with storm water runoff and flooding would be similar to Alternative A. No significant impacts to storm water facility capacity during the construction and operation of the project are anticipated. In addition, with the implementation of mitigation measures described in Section 7.13 of this document, no significant impacts to storm drains or storm drain service, capacity or flow are anticipated.

7.14.3 Cumulative Impacts

No Project Alternative

No impacts to surface water quality or storm water runoff would occur with the implementation of the No Project Alternative in conjunction with related project development.

Alternative A (Wilton/Arlington/Pico)

No significant cumulative impacts to surface water quality or storm water runoff would occur with the implementation of Alternative A. All cumulative project developments would be subject to NPDES permitting, designed to protect surface water quality. In addition, the County of Los Angeles, Hydrologic and Water Conservation Division and the City of Los Angeles, Department of Public Works, Bureau of Engineering would review cumulative project development applications and require developers to submit design drawings for new storm drains.

Alternative B1 and B2 (Wilton/Arlington/Venice)

The cumulative effects would be the same as those described for Alternative A.

Alternative C (Crenshaw/Pico)

The cumulative effects would be the same as those described for Alternative A.

7.14.4 Mitigation Measures

No Project Alternative

Implementation of any of the "build" alternatives would mitigate the no project impact.

All "Build" Alternatives

1. MTA or their contractor will be required to obtain an NPDES Construction Permit for the proposed project. The NPDES permit requires development and implementation of a Storm Water Pollution and Prevention Plan (SWPPP) emphasizing storm water Best Management Practices (BMPs). The SWPPP has two major objectives: (1) to help identify the sources of pollution that affect the quality of industrial storm water discharges; and (2) to describe and ensure the implementation of practices to reduce pollutants in industrial storm water discharges.

   Required elements of the SWPPP are: (1) source identification; (2) practices to reduce pollutants; (3) an assessment of potential pollution sources; (4) a materials inventory; (5) a preventative maintenance program; (6) spill prevention and response procedures; (7) general storm water management practices; (8)

employee training; (9) record keeping; (10) elimination of unpermitted non-storm water discharges to the industrial storm water system; (11) methods of onsite storage and disposal of significant materials; (12) sediment and erosion prevention; and (13) a topographic map of each job site extending one-quarter mile beyond the property boundaries.

2. The following construction BMPs will be implemented by MTA or their contractor to control sediment and other construction-related pollutants: (1) provide additional catch basin and storm drain channel cleaning when and where needed; (2) increase street sweeping in areas where needed; (3) create or augment a program to eliminate the improper disposal of litter into the street or area where runoff may carry these pollutants to the storm drain system; (4) recycle applicable construction materials (e.g., glass, plastic) to prevent their improper disposal into the storm drain system; (5) properly dispose of construction-related hazardous wastes to prevent their improper disposal into the storm drain system; and (6) properly use and conserve water to minimize runoff from construction areas.

3. ~~Storm~~ Water quality will be monitored by MTA or their contractor to assess the effectiveness of the BMPs and, as part of the NPDES ~~Construction~~ Permit requirements, monthly ~~annual~~ monitoring reports will be submitted to the RWQCB. With implementation of the BMPs stated above, potential water quality impacts would be less than significant.

~~4. Since the project alignment is located within both 100-year and 500-year FEMA designated flood zone areas, the MTA or their contractor will prepare and implement a flood emergency response plan for Mid-City Segment operations that identifies federal, State, regional and local agency coordination roles and responsibilities. This plan will be implemented and coordinated with the U.S. Army Corps of Engineers, the Federal Emergency Management Agency (FEMA), the Regional Water Quality Control Board, Los Angeles Region, County Department of Public Works, County Emergency Operations, County Fire Department and County Sheriff's Department, City Emergency Management Office, City Fire Department and the City Police Department.~~

7.14.5 Unavoidable Significant Adverse Impacts

No unavoidable significant adverse impacts are anticipated for surface water quality or storm water runoff after the implementation of mitigation measures.

7.15 GEOLOGY AND SUBSURFACE CONDITIONS

7.15.1 Environmental Setting

The project area is within the Los Angeles Basin which is located along the convergent boundary between the Pacific and North American crustal plates. The relative motion of the two plates produces north-south compression and nearly continuous deformation along the plate boundary. The deformation is expressed by a complex network of mountain ranges and seismically-active faults, several of which have been historically active. The locations of active and potentially active faults near the project area are shown on Figure 7-40.

The project area is located on the La Brea Plain within the Los Angeles Basin. The Los Angeles Basin is an elongated northwest-southeast-trending alluviated coastal plain (Yerkes et al., 1965), bounded on the north by the Santa Monica Mountains and the Elysian, Repetto, and Puente Hills; on the east and southeast by the Santa Ana Mountains and San Joaquin Hills; and to the west and south by the Pacific Ocean. Surface topography consists of a lowland plain that slopes gently toward the sea to the south, but is interrupted by a line of low hills and mesas extending from Newport Bay northwest to Beverly Hills.

The elevation of the project area along Crenshaw Boulevard ranges from about 200 feet above mean sea level (msl) at the intersection of Wilshire Boulevard and Western Avenue to approximately 135 feet above msl at Pico Boulevard and San Vicente Boulevard.

Soils

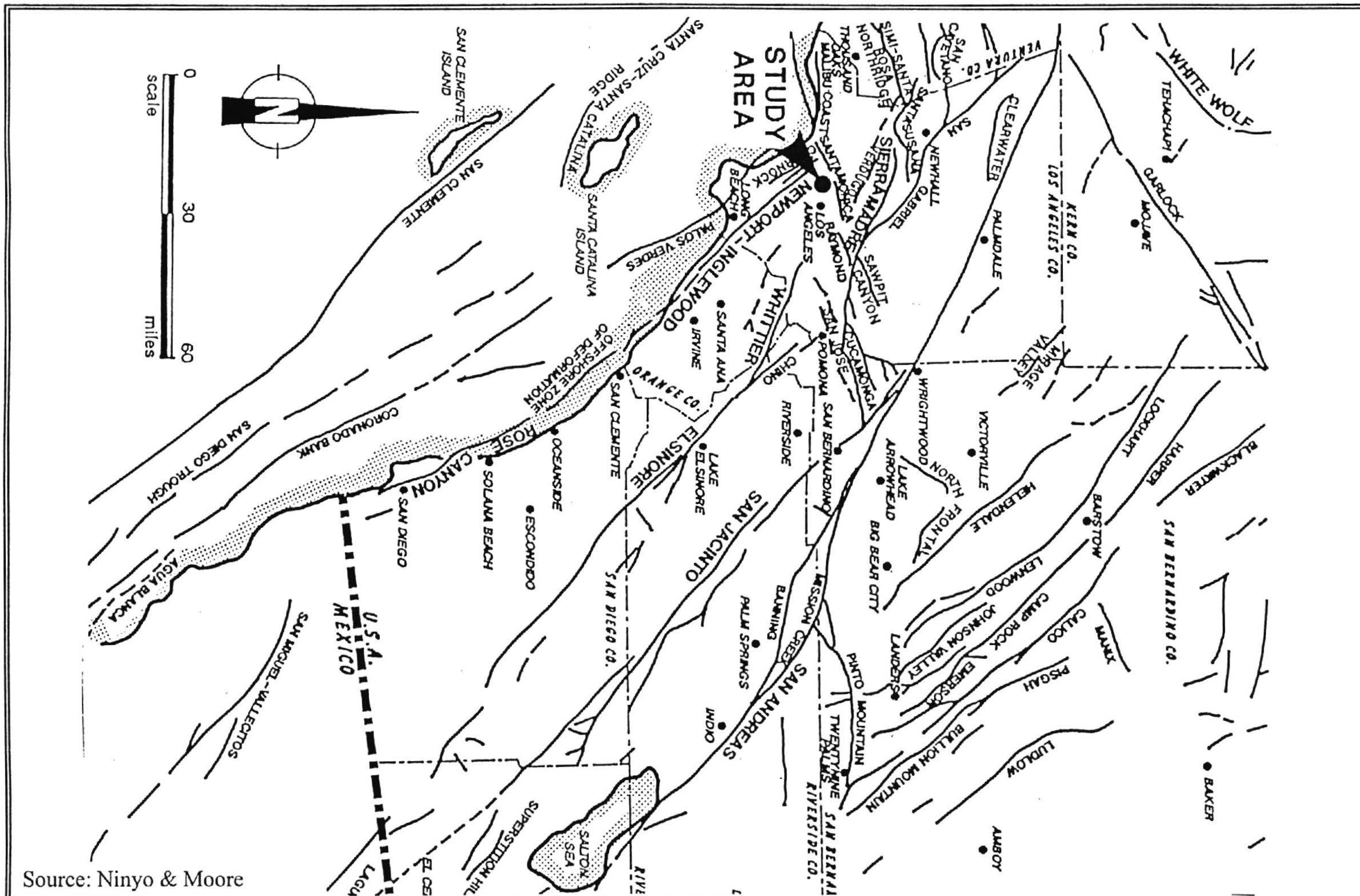
One soil association, the Ramona-Placentia association, reportedly mantles the project area (United States Department of Agriculture, 1969). This soil consists of approximately 18 inches of brown, to reddish-brown heavy loam, loam, or sandy loam underlain by approximately 30 inches of brown to reddish-brown, dense, clay loam or clay. A subsoil of compact clay loam or clay extends to a depth of approximately 5 feet. Because of the extensive urbanization in the study area, most exposures of these soils have likely been disturbed by construction activities, covered or replaced by fills transported from other locations.

Geology

The geologic units which underlie the ~~four~~ "build" alternative alignments of the Mid-City Segment include (from youngest to oldest) artificial fills, younger and older alluvium, the Lakewood Formation, the San Pedro Formation, and the Fernando Formation. The general characteristics of each unit are as follows:

Artificial Fill

Fill has been placed along portions of the alternative alignments as utility trench backfill, structural fill, basement backfill, and street subgrade. Fill materials are typically heterogeneous mixtures of silt, clay, sand, and gravel.



Source: Ninyo & Moore

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FIGURE 7-40
LOCATIONS OF ACTIVE AND POTENTIALLY ACTIVE FAULTS

Younger and Older Alluvium

In the project area, younger and older alluvial deposits of Holocene[1] to late Pleistocene[2] age have been mapped by Dibblee (1991) and have been encountered during subsurface explorations. Younger alluvial deposits consist of homogeneous and heterogeneous layers of sand, silt, clay and local gravel that have been deposited along the Ballona Creek channel and its tributaries. Older alluvial deposits are generally similar in composition to the younger alluvium; however, the surface expression of the older deposits differ, as these deposits typically occur as topographic highs that have been dissected by stream channels. These topographic highs exist along Pico and Venice Boulevards east of San Vicente Boulevard and along Wilshire Boulevard between Crenshaw Boulevard and La Brea Avenue.

The alluvial deposits thicken to the southwest and west of San Vicente Boulevard, with a maximum thickness of approximately 30-50 feet in the vicinity of Wilshire and La Cienega Boulevards.

~~Perched~~ Groundwater has been encountered at various depths within sandy zones of the alluvium. Naturally occurring methane gas has been found in low concentrations (typically less than 10 percent) within the more porous sand layers ~~lenses~~ of the alluvium (Enviro-Rail, 1996a).

Lakewood Formation

Figure 7-40.1 displays the geological formations described in this section in the vicinity of the Olympic/Arlington Station (Alternatives A and B). These geological formations are typical of the entire Mid-City area. The Lakewood Formation is upper Pleistocene in age and unconformably underlies the alluvial deposits. This formation is composed primarily of marine and non-marine silt and silty sand, with minor amounts of clay. Intervals of coarse sand and gravel occur locally within this formation.

The Lakewood Formation ranging in depth from about 10 to 50 feet is present ~~at depths~~ across the project area. The thickness of the Lakewood Formation ranges from approximately 20 feet at Wilshire Boulevard and McCadden Place and at Wilton Place and 8th Street, to greater than 60 feet between Pico and Venice Boulevards.

Perched groundwater is typically present within the Lakewood Formation. The saturated fine-grained sediments of this formation tend to provide a cap to upward gas migration and a barrier to downward groundwater flow. Tar deposits, hydrogen sulfide and methane gases are found locally within the more permeable intervals of the Lakewood Formation, and have been detected at San Vicente Boulevard near the proposed Pico/ or Venice/San Vicente Station site.

San Pedro Formation

The San Pedro Formation is lower Pleistocene in age and underlies the Lakewood Formation. Sediments of the San Pedro Formation consist of dark olive gray, fine- to medium-grained, very dense, typically weakly cemented, silty to clean sand of marine origin. Layers of coarse sand and silt are present locally within this formation (Converse Consultants West, 1992).

1/ The most recent period of geological time, present to 12,000 years ago.

2/ The second most recent period of geological time, 12,000 to 600,000 years ago.

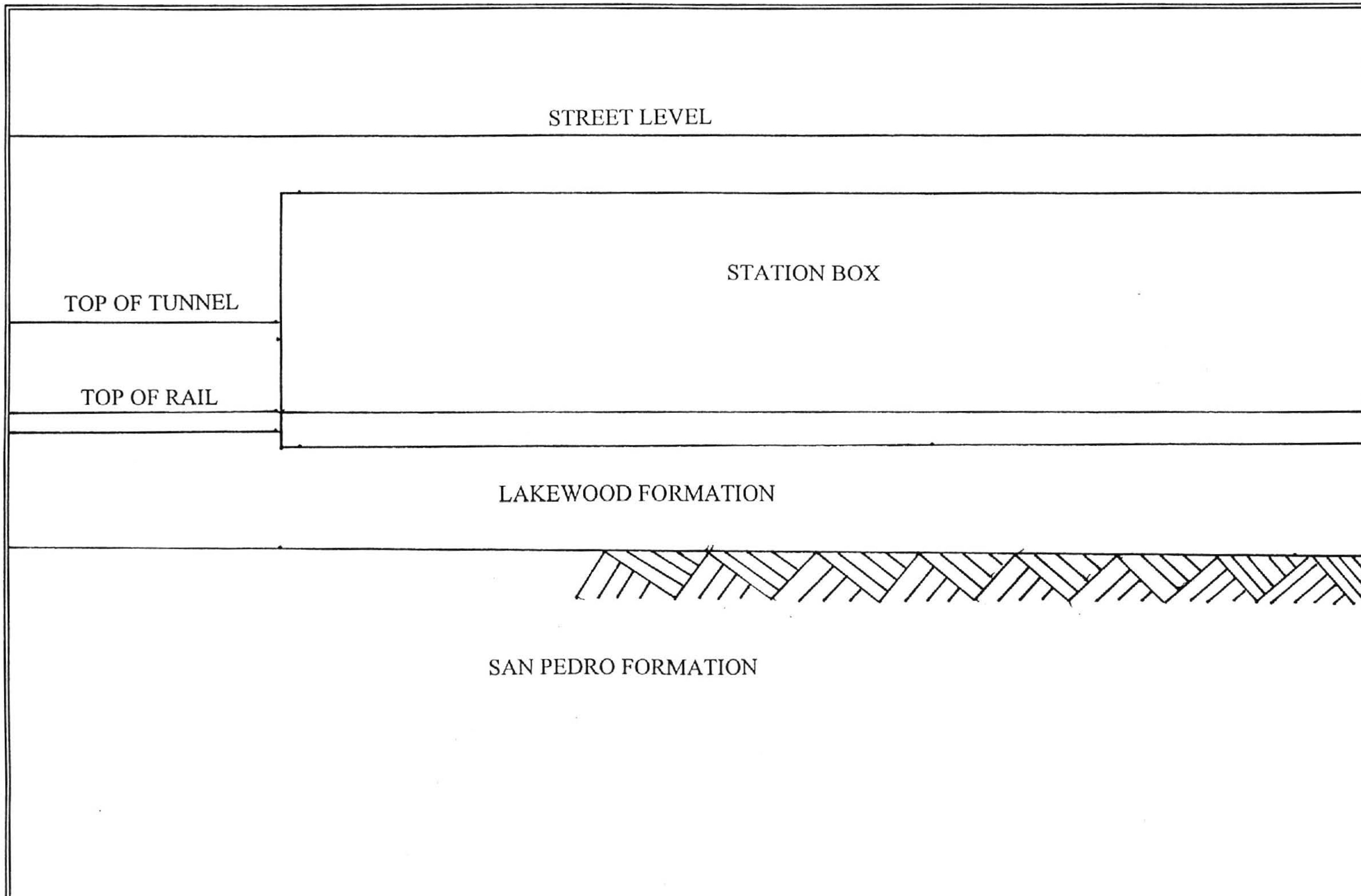

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FIGURE 7-40.1
GEOLOGICAL FORMATIONS IN THE MID-CITY AREA

The upper horizon of the San Pedro Formation is shallowest in the vicinity of Wilshire Boulevard and McCadden Place, where it is approximately 40 feet below ground surface. The upper horizon deepens to greater than 100 feet below ground surface south of Pico Boulevard between Crenshaw Boulevard and Arlington Avenue. Along the alternative alignments, the San Pedro Formation ranges in thickness from approximately 10 feet at Wilton Place and San Marino Place to greater than 80 feet near the intersection of Pico and San Vicente Boulevards.

Within the project area, groundwater occurs within the San Pedro Formation and locally saturates the deposit. Deposits of tar and oil commonly occur, although tar was observed in the project area in just four borings, near the north end of the proposed Wilton/Arlington alignment. Where this formation is not saturated with groundwater, concentrations of methane and hydrogen sulfide gases typically occur. The San Pedro Formation is generally considered to be moderately permeable, although the permeability is significantly reduced where tar and/or oil is present.

Fernando Formation

The Fernando Formation is Pliocene[3] in age and unconformably underlies the San Pedro Formation across the study area. This formation consists of consolidated, gray to greenish-gray claystone and siltstone of marine origin (Lamar, 1970). The Fernando Formation is present at depths greater than approximately 60 feet below ground surface across the project area. The upper horizon of the Fernando Formation is shallowest at the north end of the Wilton/Arlington alignment and deepens to the south to depths in excess of approximately 120 feet below the ground surface.

Tar deposits, hydrogen sulfide gas, and methane are present within fractures and sand lenses of the Fernando Formation in the study area. However, due to the low permeability of this formation, the gases may not be detectable during exploration. The Fernando Formation is not generally considered to be water bearing due to its low permeability.

Geologic Structure

The Pliocene-age and older sediments underlying the project area are folded and faulted, whereas the Pleistocene sediments are broadly folded (Hummon, et al., 1994). The Pliocene-age and older sediments are oil- and gas-bearing, and form oil and/or gas reservoirs where folds and faults trap the hydrocarbons. The Las Cienegas Oil Field and other oil fields were developed to extract these hydrocarbons in the vicinity of the alternatives.

Faults that have been mapped at depth within and near the project area are the Las Cienegas fault (associated with the Las Cienegas Oil Field), and the 3rd Street and 6th Street faults. These faults displace Pliocene-age and older sediments and could act as either barriers to, or conduits for, upward migration of gas and oil. In the Fairfax District west of La Brea Avenue, oil and gas seeps occur between the 6th Street and 3rd Street faults. The area includes the Rancho La Brea Tar Pits.

Pliocene and Holocene sediments appear to be deformed into a broad arch referred to as the Wilshire arch (Hummon, et al., 1994). The Wilshire arch is oriented east-west, roughly coincident with Wilshire Boulevard, and plunges toward the west. Several sources (Wright, et al., 1973; Wright, 1991; Tsutsumi, et al., 1994) suggest that the Wilshire arch is a Quarternary fold that may be associated with similar structures to the southeast. The Whittier Narrows earthquake of October 1987 occurred on the southeastern portion of this structural trend.

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[3]/ The third most recent period of geological time, 600,000 to 10,000,000 years ago.

Potential Geologic Hazards

Ground Shaking

The most significant potential geologic hazard in the project area is seismic shaking. The project area is located within the Los Angeles basin, a seismically active region that is known for having numerous active local faults and relatively frequent earthquakes.

The faults near the project area can be classified as either surface faults or subsurface thrust faults. The latter are often referred to as "blind" thrusts because they are not known to reach the ground surface. Portions of the Los Angeles Basin beneath the project area may be underlain by shallow-dipping blind thrusts which have little or no surface expression (Hauksson 1990). Inferred blind thrusts include the "West Los Angeles Blind Thrust" and the "Las Cienegas Thrust" (based on Hauksson 1990; Shaw 1993; and Wright 1991). The locations and characteristics of most blind thrusts are only approximately known, or are inferred. Recent damaging earthquakes, such as the 1994 M_W (moment magnitude) 6.7 Northridge earthquake and 1987 M_L (local magnitude) 5.9 Whittier Narrows earthquake, occurred on blind thrust faults in the greater Los Angeles area. In both cases, the causative faults had not been identified prior to the earthquake. Additional unrecognized blind thrusts may exist within portions of the Los Angeles Basin, including the project area.

Several active faults in the Los Angeles area are believed to be capable of generating earthquakes which may cause damage to structures in the project area. Among these faults are the San Andreas fault, the Palos Verdes fault, the Simi-Santa Rosa-Northridge Hills fault system, the Verdugo fault, and the Whittier-Elsinore fault system. Known active faults with the greatest potential for causing damage to structures in the project area are the San Fernando-Sierra Madre fault system, the Newport-Inglewood fault, and the Malibu Coast-Santa Monica-Hollywood-Raymond fault system. Figure 7-40 shows the location of the project area with respect to known active or potentially active surface faults in Southern California.

Based on the acceleration attenuation curves[4] described by Mualchin and Jones (1992), the greatest potential for seismic shaking damage in the project area would occur if an earthquake with a maximum credible magnitude of 7.5 were to occur on the Malibu Coast-Santa Monica-Hollywood-Raymond fault system. Such an earthquake could generate a peak horizontal bedrock acceleration[5] of approximately 0.61g in the project area. Peak horizontal bedrock accelerations for maximum credible earthquakes on other faults in the region are less than 0.61g. Table 7-60 lists known active faults within 61 miles of the project area which may cause damaging earthquakes in the Los Angeles area, along with the corresponding peak horizontal bedrock and repeatable ground accelerations in the project area for the maximum credible earthquake on each fault. A site specific probabilistic analysis to include thrust faults will be completed for the Mid-City design to determine design earthquake criteria.

The Northridge Earthquake of January 17, 1994 occurred at 4:30 a.m. under the north-western end of the San Fernando Valley, Los Angeles. A moment magnitude of M_W 6.7 was estimated by the U.C. Berkeley Seismographic Station. The Northridge Earthquake took place in a complex, transitional region of predominant south dipping reverse faults to the west and north dipping structures to the east. It occurred on a south dipping fault, adjacent to the north dipping structures involved in the 1971 San Fernando Earthquake. The focal depth of the epicenter of this earthquake was estimated at 18.4 kilometers. Although this earthquake created substantial

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[4]/ Acceleration attenuation curves predict the movement of bedrock due to gravity during an earthquake.

[5]/ Peak horizontal bedrock acceleration is the maximum horizontal movement of bedrock due to gravity during an earthquake.

Table 7-60
Seismic Parameters for Maximum Credible Earthquakes

Fault	Fault to Site Distance (miles)	Maximum Credible Earthquake Magnitude[1]	Estimated Acceleration (g)	
			Peak Horizontal Bedrock[2]	Repeatable High Ground[3]
Bailey	38	6.5	0.05	0.05
Central Avenue	33	6.5	0.06	0.06
Chatsworth	20	6.3	0.10	0.06
Clamshell-Sawpit Canyon	19	6.5	0.12	0.08
Clearwater	36	6.8	0.07	0.07
Cleghorn-North Frontal	51	7.8	0.11	0.11
Cucamonga-Indian Hill	26	7.0	0.11	0.11
El Modeno	28	6.5	0.07	0.07
Garlock	58	7.8	0.09	0.09
Los Alamitos	17	6.0	0.09	0.06
Malibu Coast-Santa Monica-Raymond	2	7.5	0.61	0.40
Mirage Valley	58	6.5	0.03	0.03
Newport-Inglewood	2	7.0	0.53	0.35
Oak Ridge	35	7.5	0.12	0.12
Offshore Zone of Deformation	58	7.0	0.04	0.04
Palos Verdes	14	7.0	0.22	0.14
Peralta Hills	32	6.5	0.06	0.06
Pitas Point-Ventura	53	7.3	0.05	0.05
Redhill-Etiwanda Avenue	38	7.0	0.07	0.07
Red Mountain	59	7.3	0.04	0.04
Redondo Canyon	17	6.3	0.12	0.08
Rialto-Colton	49	6.8	0.04	0.04
San Andreas (Central Mohave)	34	8.0	0.21	0.21
San Cayetano	36	7.5	0.11	0.11
San Clemente	57	7.3	0.05	0.05
San Fernando-Sierra Madre	12	7.5	0.31	0.20

Table 7-60
Seismic Parameters for Maximum Credible Earthquakes

Fault	Fault to Site Distance (miles)	Maximum Credible Earthquake Magnitude[1]	Estimated Acceleration (g)	
			Peak Horizontal Bedrock[2]	Repeatable High Ground[3]
San Gabriel	15	7.5	0.26	0.17
San Jacinto	47	7.5	0.08	0.08
San Jose	25	6.8	0.11	0.11
Santa Cruz-Santa Catalina Ridge	45	7.5	0.08	0.08
Santa Susana Thrust	20	7.0	0.15	0.10
Santa Ynez	49	7.5	0.08	0.08
Semi-Santa Rosa-Northridge Hills	14	7.5	0.27	0.18
Verdugo	8	6.8	0.29	0.19
Whittier-Elsinore	16	7.5	0.25	0.16

Notes:
1. Mualchin and Jones, 1992; Morton, Miller, and Evans, 1976.
2. Mualchin and Jones, 1992.
3. Ploessel and Slosson, 1974.

structural damage to residential, commercial and industrial facilities and infrastructure, the "in operation" MTA Metro Red Line tunnels and stations performed extremely well during this significant seismic event, with no interruption in service. There was also little or no damage to the Red Line segments under construction at that time or to existing Metrolink tunnels.

Surface Fault Rupture

Hazards from surface fault rupture in California have been documented by the California Division of Mines and Geology (CDMG). CDMG has delineated a series of fault rupture hazard areas which enclose the surface traces of known active and potentially active faults. These areas are known as Alquist-Priolo Earthquake Fault Zones (California Department of Conservation, 1994). The Earthquake Fault Zones define areas within which special geologic site studies are required to be conducted prior to building structures for human occupancy.

There are no known active faults that cross the alternative alignments, and no portion of the alternative alignments fall within a designated Alquist-Priolo Special Studies Zone or Fault Rupture Study Area. The earthquake fault which comes in closest proximity to the study area is the Newport-Inglewood fault, located approximately three miles southwest of the intersection of Pico and San Vicente Boulevards. Because of the distance of the Newport-Inglewood fault from the alternative alignments, surface fault rupture is not considered to be a significant hazard in the project area.

Liquefaction

Liquefaction is a phenomenon in which ground shaking due to an earthquake causes a sudden loss in strength of saturated, cohesionless (predominantly sandy) soils. Liquefaction and lateral spreading failures are types of ground failures that result in severe disruption of near-surface materials. Heavy structures tend to settle or overturn during liquefaction, causing severe structural and foundation distress, while buried tanks or other buoyant facilities may rise to the surface.

Sediment materials most susceptible to liquefaction are medium dense to loose, cohesionless materials (Seed and Idriss, 1982). Sediment generally becomes more resistant to ground failure with increasing age, as natural processes tend to cement, compact, and gradually pre-stress and pre-strain the material. The near surface soils in the project area are typically young, cohesionless alluvial soils, which may be susceptible to liquefaction where groundwater occurs within 30 feet of the surface. Groundwater occurs at depths from approximately 20 to 35 feet below the surface of the ground in the Lakewood Formation.

Leighton and Associates, Inc. (1990) delineated liquefaction susceptibility areas in Los Angeles County as part of its technical work in preparation of the Safety Element of the Los Angeles County General Plan. Portions of the alternative alignments occur within areas delineated by Leighton and Associates as potentially liquefiable. Along all alternative alignments, potentially liquefiable soils occur between approximately the Wilshire Boulevard/Wilton Place intersection and the Wilshire Boulevard/Norton Avenue intersection. Also along Alternative C, potentially liquefiable soils occur on Crenshaw Boulevard between approximately 9th Street and midway between Olympic and Pico Boulevards. For each alternative alignment, potentially liquefiable soils also occur on the western portion of the Pico/ or Venice/San Vicente Station site (see Figure 7-40.2). However, the site specific geotechnical reports have not identified any liquefiable soils in the project area.

Seismically-Induced Flooding

Seismically-induced flooding is the result of the failure of large water retaining structures during an earthquake. Portions of the alternative alignments are located in dam inundation areas, and would be subject to flooding in the event of dam collapse or overtopping (Leighton and Associates, Inc., 1990). Along Alternatives A and B, the area between approximately the Wilton Place/8th Street intersection and the Arlington Avenue/Country Club Drive intersection is located within the inundation area of the Silver Lake Reservoir. Along Alternative C, the area on Crenshaw Boulevard between approximately Olympic Boulevard and 12th Street is located within the inundation area of the Silver Lake Reservoir. For each alternative alignment, the proposed Pico/ or Venice/San Vicente Station site is located within the inundation areas of both the Silver Lake and the Hollywood Reservoirs.

Tsunamis and Seiches

A tsunami is a sea wave generated by a submarine displacement of the sea floor, typically caused by a submarine earthquake, landslide, or volcanic event. Tsunamis are not considered a significant hazard in the project area, because the project area is located sufficiently inland from potential tsunami inundation areas.

A seiche is a seismically-induced oscillation of water in an enclosed or semi-enclosed basin such as a lake or reservoir. There are no large bodies of water or water storage reservoirs within or adjacent to the study area; thus the project facilities would not be subject to damage from a seiche.

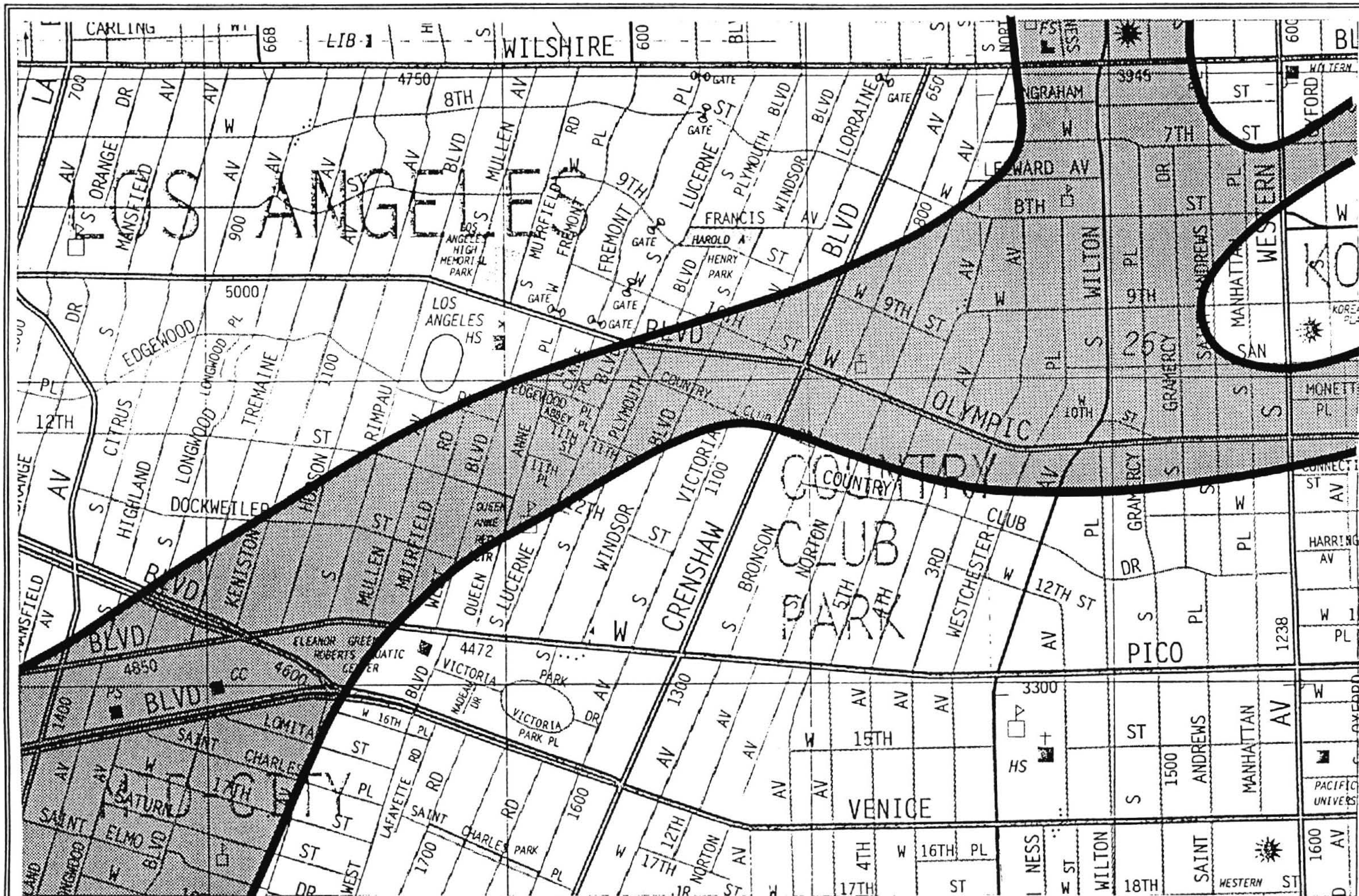

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FIGURE 7-40.2
AREAS SUSCEPTIBLE TO LIQUAFACTION

Landslides and Mudflows

Due to the relatively low topographic relief of the project area, landslides and mudflows are not considered to be substantial geologic hazards along the alternative alignments.

Subsurface Gas

The sediments of the Los Angeles Basin have been found locally to contain hazardous and potentially hazardous levels of naturally occurring hydrogen sulfide and combustible gases (primarily methane). These gases tend to occur in association with accumulations of petroleum, and therefore are most frequently encountered in the sediments overlying oil fields.

The potential for release of hazardous levels of accumulated hydrogen sulfide and other naturally-occurring, combustible/explosive gases (primarily methane) in the oil fields in the Los Angeles Basin, including fields underlying Alternative C, has been documented in the *Mid-City Extension Reassessment Study: Metro Red Line - Segment 3* (Engineering Management Consultant 1994), and *Alignment Reassessment for Metro Red Line Segment 3 Mid-City (R83) and Western Extension (G87)* (Enviro-Rail 1994). Tasks completed for these studies included hydrogen sulfide gas measurements at 40 locations, groundwater samples collected from 23 wells, cone penetrometer testing at 39 locations, soil drilling of 11 borings, and gas recovery testing and monitoring. The presence of combustible gases along Alternative A and B alignments has been documented in the *Mid-City Alternative Alignment Gas Exploration Study* (Enviro-Rail, 1996a) and the *Wilton/Arlington Alignment Engineering Feasibility Study Subsurface Gas Investigation* (Enviro-Rail, 1996c). Tasks completed for these studies included cone penetrometer testing at 16 locations, drilling of 5 borings and inspection of gas monitoring wells, a pumping test and collection of soil-gas and groundwater samples.

History of Subsurface Oil and Gas Deposits

As a result of tectonic faulting and folding, structural "traps" occur within many oil-bearing formations beneath areas of the Los Angeles Basin. These traps can result in the accumulation of oil and gas. Where sufficient oil and gas have accumulated to become commercially exploitable, oil fields have been developed to extract the subsurface fluids. One such field, the Las Cienegas Oil Field, covers approximately six square miles in a band roughly 1.25 miles wide extending from Olympic Boulevard and La Brea Avenue southeast to Adams and Main Streets and occupies a portion of the project area. This oil field has been in continuous production since its discovery in 1961 (California Department of Conservation, Division of Oil and Gas, 1991; California Department of Conservation, Division of Oil, Gas & Geothermal Resources, 1997).

Twenty known oil wells in the Las Cienegas Oil Field are located in the vicinity of the alternative alignments. Seventeen of these wells were drilled directionally from one location near the intersection of Pico Boulevard and Tremaine Avenue. The wells closest to the proposed alignments are the Chevron "Wilton Corehole" (located on the north side of Wilshire Boulevard, approximately 40 feet west of Bronson Avenue), the Union Oil Company of California "Las Cienegas Corehole" (located approximately 50 feet east of Crenshaw Boulevard and 200 feet south of Olympic Boulevard), and the Union Oil Company of California "Las Cienegas Corehole 25" located approximately 200 feet east of Arlington Avenue and 50 feet south of Pico Boulevard (Munger, 1991). Productive wells in the Las Cienegas field produce from complexly folded and faulted Upper Miocene rocks located at depths of approximately 2,500 to 6,000 feet (California Department of Conservation, Division of Oil and Gas, 1991).

Measured Subsurface Gases

Subsurface fluids have been sampled at many locations along the proposed alignments, and the results have been documented in various publications (Engineering Science, 1990; Engineering Science, 1992; Engineering Management Consultant, 1994; Enviro-Rail, 1994; Enviro-Rail, 1996a). Tasks completed for these studies included drilling of test borings, measurement of subsurface hydrogen sulfide and methane gas, groundwater sampling, cone penetrometer testing, and gas recovery testing and monitoring.

For health and safety purposes, the National Institute of Occupational Safety and Health (NIOSH) has classified hydrogen sulfide gas concentrations of greater than 300 parts per million (ppm) as Immediately Dangerous to Life and Health (IDLH), although odors can be recognized at less than 0.02 ppm (State one-hour threshold).[6] At 300 ppm hydrogen sulfide gas can cause the olfactory nerve to lose sensitivity. Hydrogen sulfide gas is not categorized as an explosive gas; it is categorized as a poison gas and a flammable gas. The eminent danger from hydrogen sulfide gas comes from inhaling it rather than from explosion. Methane gas is categorized as an explosive gas; it has a low~~er~~ explosive level ~~(LEL)~~ of 5 percent volume per volume in air (United States Department of Transportation et al., 1992).

Subsurface gases have been measured in the project area (Wilshire/Western to Pico/San Vicente) and in the Western Extension area (Pico/San Vicente to Wilshire Boulevard west of I-405), and along Wilshire Boulevard between Crenshaw Boulevard and La Brea Avenue. Along the Crenshaw Boulevard alignment (Alternative C), hydrogen sulfide gas in the San Pedro Formation has been measured at concentrations in excess of 10,000 ppm, and methane has been measured at concentrations up to 90 percent volume per volume in air. Measurements in unsaturated portions of the San Pedro Formation along the Wilton/Arlington/Pico and Wilton/Arlington/Venice alignments indicated that hydrogen sulfide gas concentrations were 90 ppm or less, with methane concentrations ranging up to 90 percent volume/volume (Enviro-Rail, 1996a). Naturally-occurring liquid hydrocarbons and asphaltic materials have also been encountered during subsurface evaluations along the alternative alignments. The table in Appendix J ~~7-61~~ summarizes the findings of the subsurface gas evaluations and the extent of hydrogen sulfide discovered for the alternative alignments.

More recent analysis was performed in the *Wilton/Arlington Alignment Engineering Feasibility Study Subsurface Gas Investigation* (August 1996). This analysis includes data from both the current study as well as the previous studies mentioned above. Along Wilton Place and Arlington Avenue, hydrogen sulfide gas was detected within the San Pedro Formation at concentrations up to 1,200 ppm at a depth of 95 feet below the ground surface. The highest concentration detected within 80 feet of the ground surface was 90 ppm.

Along Venice Boulevard between Arlington Avenue and San Vicente Boulevard, hydrogen sulfide gas was detected in the San Pedro Formation at a depth of 105 feet below the ground surface at a concentration of 3 ppm. Hydrogen sulfide gas was detected within the San Pedro Formation along Pico Boulevard at concentrations up to 6,600 ppm at a depth of 45 feet below the ground surface. The San Pedro Formation and associated hydrogen sulfide gas occurrences are at a depth of greater than 60 feet from Arlington Avenue west to approximately Muirfield Road. Along Pico Boulevard, the depth to the San Pedro Formation in the area with high hydrogen sulfide gas concentrations ranged from 38 feet to 85 feet. Along San Vicente Boulevard, hydrogen sulfide gas concentrations up to 12,460 ppm were detected at a depth of 53 feet. The depth to the San Pedro Formation ranges from 35 feet to 70 feet along San Vicente Boulevard west of the Pico/San Vicente intersection. The 12,460 concentration along San Vicente is immediately west of the Pico/San Vicente intersection.

6/ For more detailed information on hydrogen sulfide gas please refer to Section 7.12 - Air Quality.

~~Table 7-61~~
~~Summary of Subsurface Gas Reports~~

~~Report~~	~~Date~~	~~Information~~
~~Engineering Science (ES), "Compilation of Monitoring Data on Gas Probes Along Proposed Metro Rail Alignments"~~	~~1986-1992~~	~~H_2S Measurements~~ ~~Boring # — Approx. Location — ppm — Date~~ ~~SV1 — Pico/San Vicente — 200+ — 1986~~ ~~SV1* — Pico/San Vicente — >100 — 1991~~ ~~P-7 — Olympic/Crenshaw — 769 — 1992~~ ~~P-9 — Pico/San Vicente — 743 — 1992~~ ~~P-10 — Pico/San Vicente — 3,300 — 1992~~ ~~* did not open probe head due to H_2S odor~~
~~ES, "Subsurface Gas Investigation Metro Rail Red Line - Mid Cities"~~	~~Final, August 1992~~	~~Six new gas probes, additional monitoring (included above). Three of 14 subsurface probes along project alignment recorded H_2S concentrations above 300 ppm. H_2S odors were noted in other borings completed along the alignment; H_2S was not measured in these borings.~~
~~Converse Consultants West, Preliminary Geotechnical Report~~	~~September 14, 1992~~	~~Abandoned boring MC-6 (near Crenshaw/ Olympic) due to high H_2S odor, measured 240 ppm H_2S at top of boring.~~
~~Converse Environmental West, Environmental Assessment Report~~	~~September 1992~~	~~Focus on contamination, recommended additional H_2S sampling in groundwater.~~
~~Law/Crandall, Final Geotechnical Investigation (Draft) Final Report dated January 1993~~	~~September 1993~~	~~H_2S odor noted during subsurface investigation.~~
~~Enviro-Rail, "Construction Operations for Subsurface Gas Control"~~	~~September 20, 1993~~	~~+10,000 ppm H_2S at locations near Pico/San Vicente, and Crenshaw/Olympic Boulevards.~~
~~Enviro-Rail, "Toxic Gas Phase II Construction Evaluation Report for the Metro Red Line Segment 3 West Extension (R83)"~~	~~September 20, 1993~~	~~Preliminary, time-limited measurements of gas flux at two locations near the proposed stations at Olympic/Crenshaw and Pico/San Vicente suggest rates of approximately 0.3 to 3 cubic feet per minute per square foot of exposed surface area. Recommends more closely spaced monitoring program to better define the subsurface gas field pressures and concentrations.~~
~~Enviro-Rail, "Groundwater/Soils Phase II Construction Assessment Report for the Metro Red Line Segment 3 West Extension (R83)"~~	~~September 20, 1993~~	~~Groundwater to be removed by construction dewatering operations is anticipated to be impacted by (1) dissolved hydrogen sulfide; (2) naturally occurring tar and oil; and (3) three leaking underground gasoline tank sites.~~
~~Law/Crandall, Cone Penetrometer Testing "Supplemental Geotechnical Services" Draft (later combined with Final Geotechnical Investigation)~~	~~January 1994~~	~~Approximately 40 cone penetrometer tests of alluvium and San Pedro sands, confirming the presence of low concentrations of H_2S in alluvium.~~

~~Table 7-61~~
~~Summary of Subsurface Gas Reports~~

~~Report~~	~~Date~~	~~Information~~
~~Enviro-Rail, "Subsurface Gas Control Options Along Metro Red Line Segment 3 West Extension" Draft~~	~~December 17, 1993~~	~~Summarizes extraction and venting tests of San Pedro Formation.~~
~~Enviro-Rail, *Alignment Reassessment for Metro Rail Red Line Segment 3 Mid-City (R83) and Western Extension (G87)*~~	~~June 1994~~	~~In the San Pedro Formation along the Mid-City Segment, the average concentrations ranged from <10-15,000 ppm for H_2S, and from 35-90% volume to volume for combustible gas (primarily methane). The injection of air substantially reduces the concentration of H_2S in the San Pedro Formation. The muck extracted from the San Pedro Formation was not hazardous. The presence of oxidizing agents such as oxygen and hydrogen peroxide was effective in removing H_2S from soil samples.~~
~~Enviro-Rail, *Mid-City Alternative Alignment Gas Exploration Study*~~	~~March 1996~~	~~Wells drilled along the proposed Wilton/Arlington alignment encountered 20 ppm or less of H_2S gas and up to 60.4% volume/volume methane gas from the San Pedro Formation. H_2S gas was not detectible from the Lakewood Formation or alluvium. Methane gas concentrations from the Lakewood Formation and alluvium ranged up to 26.3% volume/volume. During a pumping test, H_2S concentrations as high as 90 ppm and methane concentrations as high as 95% volume/volume were measured from the San Pedro Formation. H_2S and methane appear to migrate in the San Pedro Formation during dewatering of the Lakewood Formation, if gas is present in the San Pedro. Upward migration of H_2S from the San Pedro Formation to the Lakewood Formation was not observed.~~

~~Table 7-61~~
~~Summary of Subsurface Gas Reports~~

~~Report~~	~~Date~~	~~Information~~
~~Enviro-Rail, *Wilton/Arlington Alignment Engineering Feasibility Study Subsurface Gas Investigation*~~	~~August 1996~~	~~Along Venice Boulevard between Arlington Avenue and San Vicente Boulevard, hydrogen sulfide was detected in the San Pedro Formation at a depth of 105 feet below the ground surface at a concentration of 3 ppm. Hydrogen sulfide was detected within the San Pedro Formation along Pico Boulevard at concentrations up to 6,600 ppm at a depth of 45 feet below the ground surface. The San Pedro Formation and associated hydrogen sulfide occurrences are at a depth of greater than 60 feet from Arlington Avenue west to approximately Muirfield Roads. Along Pico Boulevard, the depth to the San Pedro Formation in the area with high hydrogen sulfide concentrations ranged from 38 feet to 85 feet. Along San Vicente Boulevard, hydrogen sulfide concentrations up to 12,460 ppm were detected at a depth of 53 feet. The depth to the San Pedro Formation ranges from 35 feet to 70 feet along San Vicente Boulevard west of the Pico/San Vicente intersection. The 12,460 concentration along San Vicente is immediately west of the Pico/San Vicente intersection.~~
~~Enviro-Rail, *Wilton/Arlington Alignment Engineering Feasibility Study Subsurface Gas Investigation*~~	~~August 1996~~	~~Hydrogen sulfide was detected in the Lakewood Formation at concentrations up to 475 ppm at a depth of 23 feet below the ground surface along San Vicente Boulevard between Pico Boulevard and Tremaine Avenue. Hydrogen sulfide was also detected in the Lakewood Formation at a concentration of 20 ppm at 8th Street and Wilton Place at a depth of 20 feet below the ground surface. However, hydrogen sulfide was not detected in the Lakewood or alluvium along other portions of the alignments.~~
~~Enviro-Rail, *Wilton/Arlington Alignment Engineering Feasibility Study Subsurface Gas Investigation*~~	~~August 1996~~	~~Methane was detected in the San Pedro Formation, along Wilton Place and Arlington Avenue from Wilshire Boulevard south to 8th Street, at concentrations up to 80.5% v/v at a depth of 95 feet below the ground surface. Within the Lakewood Formation, along Venice Boulevard, the maximum methane concentration detected was 2.8% v/v at a depth of 15 feet below the ground surface. Near the proposed Pico/San Vicente Station methane concentrations of up to 50% v/v were detected as shallow as 10 feet below the ground surface.~~

~~**Table 7-61**~~
~~**Summary of Subsurface Gas Reports**~~

~~Report~~	~~Date~~	~~Information~~
~~Enviro-Rail, *Wilton/Arlington Alignment Engineering Feasibility Study Subsurface Gas Investigation*~~	~~August 1996~~	~~For the potential future extension of the Mid-City segment westerly from the Pico/San Vicente Station or the Venice/San Vicente Station, along either Pico Boulevard or San Vicente Boulevard, the San Pedro Formation occurs at a depth less than 60 feet below the ground surface and contains hydrogen sulfide concentrations greater than 1,000 ppm. This would necessitate shallow or above ground tracks. West of La Brea, the San Pedro Formation deepens to greater than 60 feet below the ground surface and conventional deep bore tunnels could be constructed.~~
~~Enviro-Rail, *Wilton/Arlington Alignment Engineering Feasibility Study Subsurface Gas Investigation*~~	~~August 1996~~	~~Ground water samples were collected for MTA in 1994 from 23 wells along the proposed alignment for Alternative C. In 1996, ground water samples were also collected for the proposed alignments for Alternatives A and B. Samples were collected from wells screened within both the alluvium and the San Pedro Formation and were analyzed for dissolved hydrogen sulfide. Hydrogen sulfide concentrations ranged from less that 0.1 ppm to 50 ppm, and were typically about 0.1 to 1.0 ppm. Dissolved hydrogen sulfide concentrations increased to approximately 5 ppm during continuous pumping of two alluvial wells at the proposed Pico/San Vicente station site (Enviro-Rail, 1994). Dissolved hydrogen sulfide was not detected in water pumped from a well at Wilton Place and San Marino Street during pump tests conducted in 1996 (Enviro-Rail, 1996a).~~

~~**Source:** Woodward-Clyde (1995). Enviro-Rail (1996a).~~

Hydrogen sulfide gas was detected in the Lakewood Formation at concentrations up to 475 ppm at a depth of 23 feet below the ground surface along San Vicente Boulevard between Pico Boulevard and Tremaine Avenue. Hydrogen sulfide gas was also detected in the Lakewood Formation at a concentration of 20 ppm at 8th Street and Wilton Place at a depth of 20 feet below the ground surface. However, hydrogen sulfide was not detected in the Lakewood or alluvium along other portions of the alternative alignments.

Methane was detected in the San Pedro Formation, along Wilton Place and Arlington Avenue from Wilshire Boulevard south to 8th Street, at concentrations up to 80.5% v/v at a depth of 95 feet below the ground surface. Within the Lakewood Formation, along Venice Boulevard, the maximum methane concentration detected was 2.8% v/v at a depth of 15 feet below the ground surface. Near the proposed Pico/ or Venice/San Vicente Station site methane concentrations of up to 50% v/v were detected as shallow as 10 feet below the ground surface.

Along either Pico Boulevard or San Vicente Boulevard, west of the Pico/San Vicente Boulevards intersection the San Pedro Formation occurs at a depth less than 60 feet below the ground surface and contains hydrogen sulfide concentrations greater than 1,000 ppm. West of La Brea Avenue, the San Pedro Formation deepens to greater than 60 feet below the ground surface.

Measured Subsurface Gases Dissolved in Ground Water

Ground water samples were collected for MTA in 1994 from 23 wells along the Alternative C alignment. In 1996, ground water samples were also collected for the Alternatives A and B alignments. Samples were collected from wells screened within both the alluvium and the San Pedro Formation and were analyzed for dissolved hydrogen sulfide gas. Hydrogen sulfide gas concentrations ranged from less than 0.1 ppm to 50 ppm, and were typically about 0.1 to 1.0 ppm. Dissolved hydrogen sulfide concentrations increased to approximately 5 ppm during continuous pumping of two alluvial wells at the Pico/ or Venice/San Vicente Station site (Enviro-Rail, 1994). Dissolved hydrogen sulfide gas was not detected in water pumped from a well at Wilton Place and San Marino Street during pump tests conducted in 1996 (Enviro-Rail, 1996a).

Oil-Contaminated Soil and Groundwater

Soil and ground water contamination has been documented in the following areas near the ~~four~~ "build" alternative alignments (Enviro-Rail, 1993):

- Localized hydrocarbon contamination of the groundwater within the San Pedro Sand has occurred near the Olympic/Crenshaw Station area. This contamination is likely associated with the release from the Chevron station.
- The shallow alluvial groundwater in the area of Wilshire Boulevard and Wilton Place has been impacted by a gasoline release from a Unocal station that previously operated on the southwest corner of this intersection. The groundwater at the tunnel elevation within the lower alluvial deposits of the San Pedro Sand has apparently not been impacted by this release.
- The groundwater in the area of Wilshire Boulevard and Manhattan Place has been impacted by hydrocarbon contamination possibly originating from a Texaco station that previously operated on the northwest corner of this intersection. This contamination appears to be primarily confined to the upper alluvial water-bearing zone.

Regulatory Framework

The City of Los Angeles requires a review of the geotechnical investigations and design recommendations of proposed developments within the City limits. Issues examined in this review include susceptibility to landslides, debris flows, potential collapsible or expansive soils, liquefaction and other geologic and seismic hazards or geotechnical design considerations that may influence the future stability of structures to be built in the City. Generally, the City uses an amended version of the 1994 Edition of the Uniform Building Code and the 1995 Edition of the California Building Code as the basis of its reviews. This document is known as the Los Angeles Building Code, and was most recently amended in 1996.

The project area is not located in an Alquist-Priolo Special Studies Zone or Fault Rupture Study Area, so no requirements are imposed by the State of California for special studies to address potential surface fault rupture hazards.

OSHA regulations and policies pertaining to subsurface gases must be followed by the MTA or their contractor during project construction.

7.15.2 Project Impacts

7.15.2.1 Construction

Thresholds of Significance Criteria

Construction of the project could affect existing geologic and soil conditions. Excavation and grading might disrupt natural or existing man-made features that protect against wind and water erosion of on-site soils. The significance of this potential impact depends on the size of the area affected, the types of soils encountered, the degree of exposure to wind and runoff waters, and the time of year and duration of the construction. Significance criteria and thresholds for geologic and soils impacts are listed in Table 7-62.

Subsurface fluids in the project area could present hazards and intermittent odor nuisances to construction workers and the general population during construction of the project. Potentially hazardous subsurface fluids include hydrogen sulfide in air or dissolved in water, methane, or contaminated groundwater. Significance criteria and thresholds for subsurface conditions are listed in Table 7-63. Odor impacts during construction are discussed in Section 7.12.

No Project Alternative

Under this alternative, the effects of the project regarding geology, soils and subsurface conditions would not occur.

Alternative A (Wilton/Arlington/Pico)

Geology

Wind and water erosion are likely to occur locally during construction of the project. The potential for significant wind and water erosion impacts would be limited by measures employed during project construction.

Settlement/Dewatering

Settlement is the shifting of soil that results in a lowering of the ground surface elevation. Increased effective stress, caused by construction dewatering, and loss of ground from tunnel excavation, and cut-and-cover construction~~, and construction dewatering~~ could ~~cause loss of ground that would~~ result in ground subsidence or settlement, which may in turn affect structures above or adjacent to the excavation area. Using the pressure face TBM's, dewatering for tunneling would be limited to special areas such as shaft and possibly crosspassage construction. In areas where there is minimal settlement or where the ground surface settles evenly, structures would tend to suffer minor, if any, damage. Uneven or extraordinary settlement can cause greater damage to structures. Such differential settlement would be more typical for the areas of tunnel boring that would be closest to the land surface, and nearest to areas of cut-and-cover construction. ~~may have greater~~

~~Fewer settlement impacts than are expected in areas where deep bore tunneling would occur, depending on the type of soils encountered, and construction techniques employed. Under the stated thresholds in Table 7-62 above, the potential for settlement and related effects on existing structures would be considered a significant impact.~~ Boring the twin tunnels could potentially cause settlement and related effects to existing structures. However, one of the most important engineering features of the proposed project would be the use of ~~state-of-the-art~~ earth pressure balance ~~face~~ tunnel boring machines (EPB TBMs). These ~~pressure face~~ EPB TBMs are state-of-the-art in that they represent the most advanced engineering technology for reducing settlement impacts during ~~deep-bore~~ tunnel construction~~, especially in tunnel areas close to the land surface~~. These ~~state-of-the-art pressure face~~ EPB TBMs

Table 7-62
Significance Criteria and Thresholds for Evaluating Geologic/Soils Impacts

Geologic Hazard/Resource	Activity	Proposed Criteria/Threshold	
		Geologic/Soils Impacts on Project	Project Impacts on Geology/Soils
Earthquake Damage	Fault Movement	Could the project be substantially adversely affected by movement along local or regional faults (i.e., lateral or vertical shifts)?	Would project development substantially alter the local/regional stress regime and possibly trigger fault movement?
	Liquefaction	Is the project located on deposits that are prone to liquefaction?	Would project development alter subsurface conditions and result in a potential for liquefaction?
	Landslides	Is the project located on deposits that are prone to landsliding in the event of seismic shaking?	Would project development create or induce a potential for landsliding?
	Differential Compaction/Seismic Settlement	Is the project located on deposits that are prone to settlement in the event of seismic shaking, and could this condition lead to a structural collapse or hazardous release?	Would project development alter subsurface conditions and create a potential for settlement during seismic shaking?
	Ground Rupture	Is the project located over a Holocene-active fault?	Would project development alter the local/regional stress regime and possibly trigger fault movement?
	Ground Shaking	Can the project be designed to survive estimated maximum ground acceleration without collapse or hazardous release?	Would project development alter the local/regional stress regime and possibly trigger seismicity?
	Tsunami	Is the project located within a tsunami run-up zone?	Would project development trigger seismicity or increase the tsunami impact area?
	Seiches	Is the project located downstream of a reservoir that could undergo an uncontrolled release as a result of a seiche, or is the project located adjacent to a body of water that could flood the site due to a seiche?	Would project development trigger seismicity or increase the potential seiche impact area?
	Failure of Dams and Levees	Is the project located in the flood zone of a reservoir that could undergo an uncontrolled release in the event of seismic shaking?	Does the project include the construction of a dam or levee that would have the potential to undergo an uncontrolled release as a result of seismic shaking, or would the project alter conditions at an existing reservoir and result in a potential for an uncontrolled release as a result of seismic shaking?
Loss of Mineral Resources	Loss of Access	Not applicable.	Would project development result in the loss of access to a mineral resource?

Table 7-62
Significance Criteria and Thresholds for Evaluating Geologic/Soils Impacts

Geologic Hazard/Resource	Activity	Proposed Criteria/Threshold	
		Geologic/Soils Impacts on Project	Project Impacts on Geology/Soils
Loss of Mineral Resources(Cont.)	Deposits Covered by Changed Land Use Conditions	Not applicable.	Would project development cover an extractable mineral resource?
	Zoning Restrictions	Not applicable.	Is the project located within an area zoned for mineral extraction?
Waste Disposal Problems	Disposal of Excavated Material	Not applicable.	Would project development require the disposal of excavated material at environmentally sensitive areas?
Slope and Foundation Instability	Landslides and Mudflows	Is the project located on or downhill of an area that is prone to landslides or mudflows?	Would project development promote the occurrence of landslides and mudflows?
	Unstable Cut and Fill Slopes	Is the project on or adjacent to unstable cut or fill slopes?	Would project development adversely alter existing cut and/or fill slopes, making them potentially unstable?
	Collapsible and Expansive Soil	Is the project located on collapsible or expansive soil, and could this condition lead to a structural collapse or hazardous release?	Would project development trigger collapse or expansive soil behavior that would lead to a structural collapse or hazardous release?
	Trench-Wall Stability	Is the project located on weak near-surface materials that are prone to failure in trenched excavations?	Would project development adversely alter the condition of subsurface materials and create unstable trench wall conditions?
Erosion, Sedimentation, Flooding	Erosion of Graded Areas	Not applicable.	Would project development expose areas to erosion, and create potential impacts to other areas or projects?
Land Subsidence	Extraction of Groundwater, Oil, Gas, Geothermal Energy	Is the project located in an area subject to damaging subsidence from the extraction of fluids or gas from the subsurface?	Does the project include the extraction of fluids or gas that would induce damaging settlement?
	Hydrocompaction, Peat Oxidation	Is the project located on soils containing significant amounts of peat, or soils that are subject to hydrocollapse?	Would the project induce collapse behavior in peat-bearing soils, or soils subject to hydrocollapse?

Notes:
1. List of geologic hazards and issues is from California Division of Mines and Geology, 1975, Note 46.
2. Drainage and increases in impervious surfaces are addressed under Water Quality.
3. Loss of excavated materials during tunnel excavation also could affect geology and soils by resulting in ground settlement. This effect would be considered "man-made" because it would result from construction activities rather than from unstable soils.

Source: Woodward-Clyde (1995).

Table 7-63
Significance Criteria and Thresholds for Evaluating Subsurface Fluids

Subsurface Hazard	Subsurface Fluid Impact on Project	Project Impact on Subsurface Fluids
H_2S in Air	Are workers exposed to levels of H_2S in excess of the personal exposure limit of 10 ppm established by the Occupational Safety and Health Administration (OSHA)? Is the general population exposed to H_2S gas above the State public health threshold of 0.03 ppm?	Not applicable.
Methane	Are workers or the general population exposed to levels in methane which would exceed the lower explosive limit of 5% volume per volume in air?	Not applicable.
Compounds Dissolved or Suspended in Groundwater	Would groundwater require treatment prior to discharge to reduce concentrations of sulfur compounds, oil and grease, turbidity and hydrocarbon compounds?	Would project dewatering move contaminants into areas or zones presently uncontaminated?
Tar	Would tar seep into tunnel segments and stations?	Not applicable.

Source: Woodward-Clyde (1995).

have been successfully used in other subway projects internationally and have typically resulted in ~~far~~ less settlement impacts when compared to other types of excavation methods ~~TBMs~~. By using this advanced and proven technology (in association with compaction grouting), the settlement impacts of the proposed project would be less than significant.

Urban landscaping would not be significantly affected by construction dewatering. Existing maintenance activities, including watering, would continue during construction. Soils above the water table generally comprise the root zone of urban trees and other vegetation; these soils would retain levels of water sufficient to sustain existing landscaping. Dewatering would also occur within the cut-and-cover segments of the alignment. Water collected during the dewatering process would be treated per the requirements of the NPDES Permit (see Section 7.14 for additional information on the NPDES Permit) and released to the storm water system.

Subsurface Gases

Subsurface hydrogen sulfide gas is likely to be encountered during project construction. To reduce the likelihood of encountering hydrogen sulfide gas, pre-venting by air injection and vapor extraction would be performed where necessary along the project alignment prior to construction. If low concentrations of hydrogen sulfide were encountered after air injection, additional ventilation would be used to dilute concentrations to safe levels. These design features would render the potential effects of subsurface hydrogen sulfide gas on project construction to a less than significant level.

Concentrations of methane gas which exceed the lower explosive limit (LEL) are likely to be encountered during tunnel excavation. In addition to the pre-venting discussed above, to reduce the impact of methane gas during construction, a system consisting of monitoring, ventilation, spark control, gas control, and refuge would be implemented. Monitoring would be conducted through probes, continuous measurement of the air in the work environment, measurements of the ventilation air, with audible and visual signals installed on tunnel boring machines to alert employees to the presence and level of methane gas. Ventilation would be sufficient to preclude a dangerous accumulation of fumes, vapors or gases and would not be less than 200 cfm per worker at a velocity of not less than 30 linear feet per minute. Sources of ignition would be limited to atmospheres containing less than 20 percent of the LEL and under the direct supervision of qualified personnel. These design features would render the potential effects of subsurface methane gas on project construction to a less than significant level.

Groundwater and Other Subsurface Fluids

Dewatering would be performed during cut-and-cover construction activities. Dewatering is the artificial lowering of groundwater levels by means of pumping. Construction activities would be scheduled to include dewatering for excavation at or below the groundwater table. Dewatering is generally accomplished by advancing slotted pipes into the saturated soils and then pumping or allowing water to flow from the pipes, thus lowering the groundwater table locally. Alternatively, groundwater may be removed by pumping from shallow ditches or sumps within an excavation.

Groundwater containing dissolved hydrogen sulfide is present in the project area at concentrations ranging from less than approximately 0.1 ppm to 50 ppm, most typically in a range between 0.1 ppm to 10 ppm (Enviro-Rail, 1994). Two water treatment systems would be installed to treat water produced by dewatering prior to discharge to storm drains. Components of the water treatment systems are described in Section 7.14.2.1.

In addition, techniques such as construction of slurry walls, may be used for segments of the alignment to reduce the potential for movement of dissolved contaminants into areas or zones presently uncontaminated. A slurry wall, also known as a concrete diaphragm wall, is a type of subterranean wall which is built to act as a barrier to groundwater flow. It is constructed in a trench which contains a viscous mud slurry. Concrete is placed through a pipe ~~tube~~ at the bottom of the trench in a process which displaces the mud upward. Reinforcement of the wall is obtained by placement of vertical steel sections, or cages of reinforcing steel. Slurry walls can be designed to achieve a specified degree of stiffness and water-tightness, and can be integrated into the permanent structure (Juran and Elias, 1991). With these construction features in place, the effects of dissolved hydrogen sulfide gas in groundwater would be less than significant.

Hazardous Materials

Unmapped oil and gas wells may be encountered during tunnel excavation. Techniques such as ground penetrating radar may be used to detect wells in the path of the tunnel excavator. Encountered wells would be plugged and abandoned in accordance with the requirements of California Division of Oil, Gas & Geothermal Resources and the California Occupational Safety and Health Administration.

Tar sands are present in the project area. Tar sands can be a concern for the project for two reasons. When tar sands are rapidly unloaded, as would take place during excavation, dissolved hydrogen sulfide gas in the tar comes out of solution, causing the sediment to expand and lose a portion of its strength. Additionally, there is evidence that tar sands may exhibit creep, which can lead to excavation, shoring, and bearing capacity problems (United States Department of Transportation, 1992).

As part of the geotechnical work undertaken for the design of the Olympic/Crenshaw Station, borings were excavated to define the vertical and horizontal extent of the tar sands, and to measure the gas content and geotechnical characteristics (Law/Crandall, Inc., 1994). Among the characteristics measured were shear (lateral deformation produced in a body by external force) strength and deformation (any change in the original form or volume of rock masses by folding or faulting) characteristics at various temperatures, confining pressures, strain rates, and levels (United States Department of Transportation, 1992). Based on these tests, project design criteria would be formulated to maintain the stability of project facilities in tar sand areas. These criteria would include specifications for excavation, shoring and foundation design. Due to the high viscosity (resistance of liquids to instantaneous change of shape, or to instantaneous rearrangement of their parts due to internal friction) of the subsurface tar, design elements constructed to reduce the potential for seepage of water into tunnel segments and stations would also exclude subsurface tar. With these project design features in place, the effects of tar on project construction would be less than significant.

Soils excavated during tunneling and cut-and-cover construction activities generally would consist of clean, unconsolidated silt, sand, and gravel, which are non-hazardous soils. Some of the excavated soils, however, may be contaminated with hydrocarbons or other chemicals which may have leached into the soils from underground storage tanks or other sources along the project alignment. Known locations of underground storage tanks within the project area include a gas station at the southwest corner of Olympic and Crenshaw Boulevards and a gas station near the site of the Olympic/Arlington station. Excavated soils contaminated from these stations may be classified as hazardous. These materials would be removed and safely disposed at a Class I hazardous waste disposal facility.

Excavated Dirt

Excavated dirt from cut-and-cover construction activities or from tunnel excavations would be stored on the construction staging area at Pico/San Vicente. The height of the excavated dirt piles could be a significant effect of the project if they are not properly managed.

Alternative B (Wilton/Arlington/Venice)

Construction impacts to geology, settlement/dewatering, subsurface gases, subsurface fluids/groundwater and hazardous materials would be similar to Alternative A.

Alternative C (Crenshaw/Pico)

Construction impacts to geology, settlement/dewatering, subsurface gases, subsurface fluids/groundwater and hazardous materials would be similar to Alternative A.

7.15.2.2 Operation and Maintenance

Thresholds of Significance Criteria

The geology and soils in the project area could present hazards for the project facilities. Potentially hazardous geologic or soil conditions, such as earthquakes, slope instability, or unstable foundation soils, might cause damage to the project facilities during operation of the project. The potential for these types of hazards depends on the local tectonic setting of the site, its underlying ground conditions, and its topographic relief. Significance criteria and thresholds for geologic and soils impacts are listed in Table 7-62, above.

Subsurface fluids in the project area might present safety hazards and intermittent odor nuisances to the general public during operation of the project. Potentially hazardous subsurface conditions include hydrogen sulfide gas in air or dissolved in water, methane, or contaminated groundwater. Proposed significance criteria and thresholds for subsurface conditions are listed in Tables 7-62 and 7-51, above.

No Project Alternative

No significant impacts would occur with the implementation of the No Project Alternative.

Alternative A (Wilton/Arlington/Pico)

Geology and Soils

The project would not have a significant impact on regional geology or soils. The project does not have the potential to alter the local or regional stress field sufficiently to trigger seismicity or fault movement. The project would not increase susceptibility to seismic settlement or liquefaction. Hazards associated with natural slopes, such as landslides and mudflows, are considered insignificant due to the low topographic relief in the project area.

The geologic characteristics of soils in the project area include a low potential for collapse or expansion. Therefore, these soils would be unlikely to result in structural collapse of project facilities.

The major operational impact of the geology to the project would be the potential for damage from local and regional earthquakes. Effects of earthquakes that could damage project facilities include fault movement, ground rupture, ground shaking, liquefaction, and seismic settlement. The potential effect on the project of each of these seismic hazards is discussed below.

Fault movement could occur in either a vertical or horizontal direction, or both. Because the project alignment would span a length of about 2.3-2.6 miles, the project would be subject to damage caused by regional deformation associated with both surface and subsurface faulting. Typically, ground deformations on the order of inches to feet accompany large earthquakes, even if there is no surface rupture. As discussed previously, ground rupture is not likely to occur in the project area.

Seismic shaking is a significant geologic hazard to the project. The character and strength of ground shaking in the Los Angeles Basin is difficult to predict. However, it is likely that the project area would experience strong ground shaking during the life of the project. Depending on the frequency and amplitude of the ground motions, the tunnels and stations could be subject to failure if not designed to withstand significant seismic shaking. The potential for failure would be increased if liquefaction or settlement occurred in combination with the shaking.

Observations made after the January 17, 1994 Northridge earthquake found that the integrity of the tunnel linings in MTA Red Line Segment 1 was not affected by those earthquake motions. Some spalling (chipping, crumbling) of pre-existing mortar patches and slight opening (less than approximately 1/32 inch) of pre-existing longitudinal and circumferential cracks were observed. New cracks were few and typically formed at the edges of existing cracks and typically were less than two inches long. The rate of water inflows into the tunnels, through pre-existing cracks and holes cored during lining studies prior to the earthquake, decreased to below pre-earthquake levels within nine days after the main shock.

Settlement

~~A portion of the project area is underlain by liquefiable soils. Soil liquefaction in the project area may result in local ground failure, which could damage some project facilities.~~ Seismically-induced settlement may ~~also~~ occur in the project area. The project would not alter the potential for seismically-induced ~~liquefaction or~~ settlement. With incorporation of the current MTA design features regarding tunnel strength, foundation underpinning, soil densification, and dewatering, the effects of ~~liquefaction and~~ seismically-induced settlement on project facilities would be less than significant.

Subsurface Gases

Subsurface gas, most notably hydrogen sulfide and methane, is present along the alignment for Alternative A. The presence of hydrogen sulfide in the tunnels and stations is undesirable because of its unpleasant odor, its toxicity, ~~explosivity~~ and its corrosive effect on materials, especially electronic components. Methane is undesirable because it is explosive. Hydrogen sulfide is also explosive, however, concentrations (percentage in air) to form explosive conditions are well above toxic levels, and therefore toxicity and odor control are the primary concerns. Furthermore, explosive levels of hydrogen sulfide have not been encountered during exploratory boring construction. Minor quantities of these gases could infiltrate the project facilities if the facilities contained cracks or leaks and if air pressures outside the facilities were greater than the internal air pressure. Gases could also enter the tunnels and stations dissolved in infiltrating groundwater.

The tunnel elevation of all four alternative alignments is shallower than was considered in previous NEPA/CEQA documents prepared for the Mid-City Segment. The alternative alignments have been moved closer to the land surface to substantially lessen the possibility of hydrogen sulfide gas intrusion.

Seepage of hydrogen sulfide gas into the tunnel due to a breach caused by a large earthquake would not expose patrons to dangerous levels of hydrogen sulfide gas after the implementation of control measures (United States Department of Transportation, et al., 1996).

Groundwater and Other Subsurface Fluids

MTA has experienced a water infiltration rate of about 0.005 gallons per minute per foot (gpm/ft) to tunnels and stations of Metro Red Line Segments 1 and 2. Seepage for the proposed Mid-City Segment would be reduced by the use of a precast-gasketed tunnel liner type construction, but should groundwater infiltrate, to reduce the effects of water seepage, a water treatment system would be included in the ancillary facilities at the stations, in conformance with NPDES permit requirements. Water would be treated by oxidizing the hydrogen sulfide to sulfur, and by adsorption of dissolved organic compounds with activated carbon. Other components of the treatment system would include equalization and sedimentation tanks, an oil/water separator, granulated activated carbon units, and bag or pressure filters and piping. Treated water would be discharged into the municipal sewer system. Back-up power sources would be available to run equipment. With these project design features in place, the effects of dissolved hydrogen sulfide in ground water would be less than significant.

Methane gas concentrations would be kept low during operation of the project through the use of appropriate tunnel ventilation. The ventilation procedures are described below under Alternative C.

Alternative B (Wilton/Arlington/Venice)

Impacts to geology and soils, settlement, subsurface gases and subsurface fluids/groundwater would be similar to Alternative A.

Alternative C (Crenshaw/Pico)

During operations, Alternative C impacts to geology and soils, settlement, subsurface gases, and subsurface fluids/groundwater would be similar to Alternative A. In addition, during the operation and maintenance of Alternative C, minor amounts of hydrogen sulfide gas (i.e., above odor thresholds) could enter the tunnels and stations. Along the alignment for Alternative C, tunnel air would be vented out through two vent structures, one located on the southwest corner of Wilshire Boulevard and Norton Avenue, and the other on the northwest corner of Victoria Avenue and Pico Boulevard. Immediate dispersion would render the vented air non-hazardous. An automated system of emergency ventilation fans would be activated to further reduce levels of hydrogen sulfide gas in the project facilities. Backup power sources would be available to run fans and other essential equipment in an emergency. Gas detector sensors would be provided within the tunnels and stations. Leak repair teams would be organized and would have procedures in place to immediately respond to gas alerts or alarms.

The continuous ventilation of the tunnels and stations may result in very low hydrogen sulfide gas concentrations being maintained at or near existing conditions outside the station or ventilation shaft areas. The ventilation consists of a combination of natural ventilation, ventilation created by train movements, and a tunnel exhaust system that would operate continuously during revenue service. Additionally, a system of emergency ventilation fans would be provided. This emergency system would be designed so that if increasing levels of gas are not responded to in an appropriate manner by a human operator within 30 seconds, a computerized sequence of events would be initiated to activate fans, blowers, vents, and other ventilation equipment. With the implementation of these measures, the impacts of subsurface gas concentrations would be less than significant.

7.15.3 Cumulative Impacts

7.15.3.1 Construction

No Project Alternative

No cumulatively significant impacts are anticipated with the implementation of the No Project Alternative.

Alternative A (Wilton/Arlington/Pico)

Construction of cumulative development in the project area, consisting primarily of residential and commercial facilities, would increase the potential for local wind and water erosion because more structures under construction would disrupt on-site soils. Measures commonly employed during construction, such as spraying with water and drainage control measures, would limit the potential for significant wind and water erosion impacts from cumulative development.

Alternative B (Wilton/Arlington/Venice)

Cumulative construction impacts, in conjunction with the development of related projects, would be similar to Alternative A.

Alternative C (Crenshaw/Pico)

Cumulative construction impacts, in conjunction with the development of related projects, would be similar to Alternative A.

7.15.3.2 Operation and Maintenance

No Project Alternative

No cumulatively significant impacts are anticipated with the implementation of the No Project Alternative.

Alternative A (Wilton/Arlington/Pico)

Cumulative development would not affect geologic or soils conditions in the project area. Because the project facilities would be located in seismically-active Southern California, the project would add to the overall number of MTA facilities subject to potential seismic shaking. The project would be designed and built to current earthquake design standards. This would reduce the overall risk of failure during a seismic event.

Alternative B (Wilton/Arlington/Venice)

Cumulative operational and maintenance impacts, in conjunction with the buildout of related projects, would be similar to Alternative A.

Alternative C (Crenshaw/Pico)

Cumulative operational and maintenance impacts, in conjunction with the buildout of related projects, would be similar to Alternative A.

7.15.4 Mitigation Measures

1. During cut-and cover activities, mitigation measures will be implemented by MTA or their contractor to reduce the potential for settlement, and address the stability of excavated areas and surrounding properties. These measures will include installation of soldier piles and a timber or shotcrete lagging sheeting system, or other ~~and~~ appropriate excavation and support systems ~~bracing~~ procedures. In addition, adjacent buildings will be monitored for movement.

2. During tunnel excavation, mitigation measures to be implemented by MTA or their contractor will include the use of chemical or compaction grouting, appropriate dewatering system design installation and operational procedures, and use of a pressure face tunnel boring machine. Compaction grouting involves injecting a sand, water and cement mixture into the ground under pressure. Chemical grouting involves injecting a chemical, such as sodium silicate, into the ground and allowing it to migrate and fill the pore openings and thereby increase the ~~density and~~ stability of the soil. The pressure face tunnel boring machine will keep a pressure on the face and install precast concrete segments to support the surrounding earth. These precast bolted gasketed segments form the structural lining system. Ground settlement will be monitored during tunneling. An action level amount of ground settlement (e.g., 1 inch or a maximum angular distortion on a structure) that will trigger remedial action will be specified in construction contracts. Remedial action to be taken if the action level is realized will include measures such as grouting ahead of the tunnel and/or adjusting the face pressure on the TBM.

3. Pressure face tunnel boring machines (TBMs) will be utilized for the Mid-City Segment by MTA or their contractor. The principal technological advantage of the pressure face TBM is a ~~substantial~~ reduction in surface settlement, in comparison with other types of excavation methods ~~tunnel boring machines~~. This is due to the fact that the slurry shield TBMs are extremely well adapted to changing soil conditions. The slurry shield TBMs stabilize the soil by continually injecting a wet slurry into it, while the earth pressure balance shield creates stable soil conditions by keeping the forward section of the machine under constant earth or fluid pressure.

4. Hydrogen sulfide gas impacts will be mitigated by MTA or their contractor by pre-treating such as pre-venting by air injection and vapor extraction where necessary prior to construction and by using the pressure face TBM during construction. To reduce the impact of methane gas during construction, a

system consisting of ~~pre-venting,~~ monitoring, ventilation, spark control and gas control will be implemented. The tunnels will be engineered to minimize gas intrusion during operations. Specifically, the pressure face TBMs in combination with gasketed tunnel liners will minimize water and gas intrusion. Gas detector sensors will be installed within the tunnels and stations, and will be designed to immediately inform MTA personnel of any unsafe concentrations of gas. Leak repair teams will be immediately dispatched to repair any cracks or leaks.

5. Groundwater contaminated with hydrocarbons could be drawn into the project area as a result of dewatering activities associated with the project. Fixed and mobile treatment units will be used by MTA or their contractor to treat groundwater from dewatering, water from seepage into the tunnels and station excavations, stormwater and construction water. The treatment systems will typically consist of the following operations:

   - oxidation of dissolved hydrogen sulfide;
   - flocculation (separation of suspended solids during water treatment by chemical creation of clumps or flocs) and sedimentation of colloidal (finely divided solids which will not settle but may be removed by coagulation or biochemical action or membrane filter) and suspended material;
   - Activated carbon adsorption for removal of dissolved organic compounds;
   - Removal of oil and grease from water generated from construction activities;
   - Use of an equalization tank for stormwater to dampen peak flows.

6. Any hazardous materials encountered during project construction would be safely removed, temporarily stored, and properly transported to a hazardous waste treatment and/or a Class I designated hazardous waste disposal facility.

7. The project's tunnels will be designed by MTA or their contractor in accordance with current MTA design criteria, incorporating the most recent information on potential seismic shaking, seismically induced liquefaction, and hydrogen sulfide gas in the study area. Such design features will include pre-cast reinforced concrete tunnel segments. Emergency systems will provide any additional ventilation required until passengers are evacuated in the event of an earthquake. Upon incorporation of this and other design features, the effects of seismic shaking on the project will be less than significant.

8. To prevent infiltration of both gas and water to the project facilities, MTA or their contractor will add gaskets to tunnel liners, will strengthen conduit seals and collars and caulking of seams and cracks, and will continuously vent the air in tunnels and stations. Gas detector sensors will be provided within the tunnels and stations, rather than using a central analyzer. Leak repair teams will be organized prior to any event and will have procedures in place to immediately respond to gas alerts or alarms. Air sampling tubes will be strategically located in the stations and tunnels to help identify potential sources of gas intrusion. Air samples from the project facilities will be collected and tested at regular intervals to monitor flammable and toxic gases before harmful or explosive concentrations could accumulate. MTA personnel will be trained to appropriately recognize and respond to conditions involving gas infiltration.

9. The overall height of excavated dirt piles stored on a construction staging area will be managed by the MTA contractor in accordance with the direction provided by the MTA construction manager.

7.15.5 Unavoidable Significant Adverse Impacts

Implementation of the mitigation measures will reduce the geology and subsurface effects to a level of less than significant.

7.16 HISTORIC RESOURCES

Introduction

The purpose of this section is to identify significant historic resources within the study area and to evaluate the adverse effects which subway construction and operation might have upon these resources.

When the MTA first adopted the LPA for the Metro Red Line Mid-City Segment in 1992, the planned alignment followed Crenshaw Blvd. in the manner now comprising Alternative C in this SEIS/SEIR. Originally, Alternative C was configured as a deep bore tunnel, not a cut-and-cover shallow alignment, as now is the case. The historic and archaeological resources sections of this SEIS/SEIR for Alternative C was compiled by Enviro-Rail (ER) and Myra L. Frank & Associates (MFA) in 1995 and 1996.

Data for Alternatives A, and B was gathered and evaluated by Archaeological Associates (AA) in 1997. Alternative B is subdivided into Alternatives B1 and B2, the difference depending upon the final grade or elevation of ~~whether~~ the proposed Venice/San Vicente Station~~ is an open air or aboveground station~~. It has been found that, for the purposes of historical and archaeological resources, there is no significant difference between the ~~subalternatives~~ Alternatives B1 and B2 pursuant to provisions of CEQA or NEPA. Therefore, these two ~~sub~~alternatives are ~~not~~ addressed as Alternative B in this study.

A Memorandum of Agreement (MOA) was executed for the Metro Rail Project in November 1983 by the State Historic Preservation Officer (SHPO), the Advisory Council on Historic Preservation, the Urban Mass Transportation Administration (now the Federal Transit Administration [FTA]) and the Southern California Rapid Transit District (now the Metropolitan Transportation Authority [MTA]). Following completion of the FSEIR/FSEIS in 1992 and selection of the Mid-City LPA, SHPO determined that the 1983 MOA did not require amending. That MOA is still in effect, but may be subject to modification commensurate with impacts anticipated for this segment of the project.

In order to restrict the length of the text which follows, only fundamental information is included. The reader is referred to a companion document, the *Request for Determination of Eligibility and Effects Report (RDE) for the Metro Rail Red Line Mid-City Extension in the City of Los Angeles, California* (Archaeological Associates, 1997) for full details regarding historic and prehistoric background information, public coordination, methods, historic resources inventory forms, etc. This document can be viewed in the Library, 15th Floor, at the MTA.

7.16.1 Environmental Setting

Compliance Legislation in General

Historic resources were evaluated for significance under criteria based on two separate but overlapping legislative sources: (1) the National Historic Preservation Act of 1966 (NHPA), which includes criteria for eligibility to the National Register of Historic Places (NRHP); and (2) the California Environmental Quality Act (CEQA), as amended in 1992, which includes criteria for eligibility to the California Register of Historical Resources (CRHR).

Essentially, all resources which have been determined eligible for the National Register are also eligible for the California Register, but the latter also provides for the inclusion of additional resources that have been identified by historic resource surveys or that have been designated as a result of a local landmark ordinance. Thus, many cultural resources are significant under California law but need not be addressed under Federal law. The situation is further complicated by the fact that the criteria applied to assess impacts on historic resources differ between federal and state statutes.

This section identifies historic resources and evaluates potential impacts pursuant to state law (CEQA). The reader is referred to the "Section 106 Compliance" portion of this SEIS/SEIR for criteria, identifications, and evaluations pursuant to federal law (NHPA).

CEQA Compliance

In September of 1992, the California Legislature passed Assembly Bill No. 2881 which became Section 21084.1 of the Public Resources Code, thereby amending CEQA. The amendment defined historic resources as any property listed or determined eligible for listing in the newly established California Register of Historical Resources (CRHR). Projects substantially adversely affecting such resources might be regarded as projects that may have a significant effect on the environment.

According to CEQA, a resource may be listed as an historic resource in the California Register if it:

(1) Meets one of National Register of Historic Places criteria A through D; or
(2) Has been determined eligible for, or is listed in the National Register of Historic Places; or
(3) Is a State Historical Landmark designated after No. 770 and potentially if it was designated before No. 770; or
(4) Is a Point of Historical Interest; or
(5) Has been determined significant by the State Historic Resources Commission, including individual resources, contributors to historic districts, significant resources identified in qualifying historic resources surveys, locally designated historical resources, districts, or landmarks (i.e. City of Los Angeles Historic-Cultural Monuments), or has been designated under any municipal or county ordinance (i.e. in an historic preservation overlay zone). (PRC §5024.1).

Since Section 21084.1 is a relatively new law, review procedures for identification of qualifying historical resources are still being defined. To anticipate this review process, resources which would qualify under CEQA but not Section 106 (NHPA) have been identified and effects analyzed in this section.

Identification of Historic Properties

Study Area (Area of Potential Effect (APE))

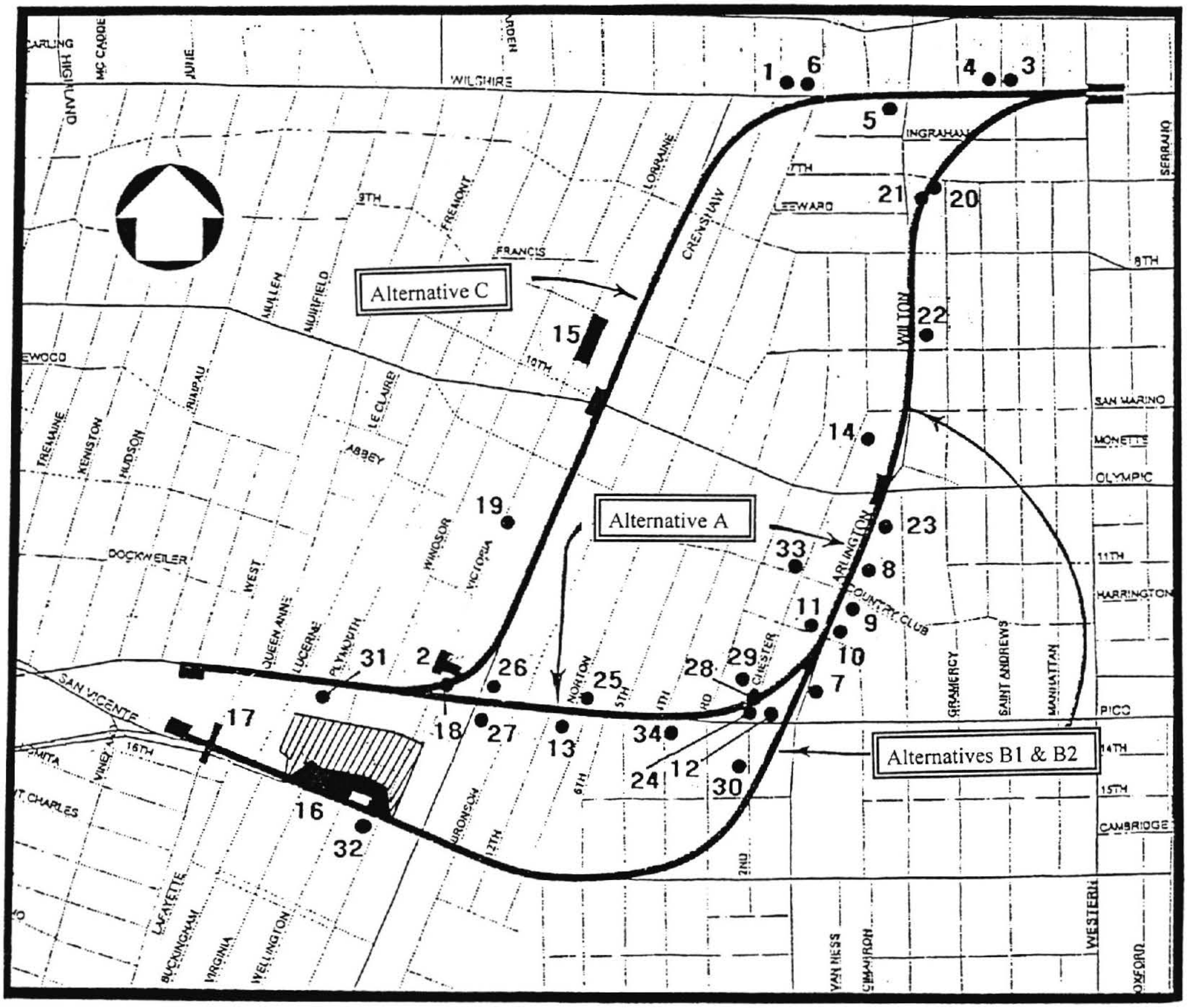
The study area or Area of Potential Effects (APE), was defined to comply with the requirements of both Section 106 of the NHPA and CEQA. Generally, it includes all properties which are contiguous with the alternative alignments although it is broadened in the areas of prospective stations. Development of the APE map was coordinated with the State Historic Preservation Officer (SHPO). The reader is referred to the RDE for detailed maps and the Section 106 portion of this SEIS/SEIR (section 7.19) for additional details.

Properties Identified as Significant

Every structure over 50 years old within the APE was examined and photographed in the field. Thus, the study includes a grand total of 545 individual structures and 3 districts. Building, Structure, and Object records (DPR 523B forms) and District records (DPR 523D) were filled out for each of these structures and districts. Forms for those structures identified as potentially eligible for the NRHP and the CRHR are appended to the RDE. Here we shall present only a summary which encapsulates the results of the study.

A total of 34 locations were identified as potentially eligible for the CRHR (Table 7-64; Figure 7- 41). They include one structure and one district already determined eligible for the NRHP, 13 additional structures and two

Table 7-64 **List of Significant Structures within the APE**	
a	**Historic Structures Previously Determined Eligible for NRHP**
1	Los Altos Apartments, 4121 Wilshire Blvd.
2	Oxford Square Craftsman District; 1237-1269 Victoria Ave.
b	**Historic Properties Appearing to be Eligible for NRHP**
3	Wilshire Professional Building, 3875 Wilshire Blvd. (ER/MFA)
4	St. James' Episcopal Church, 3901-3905 Wilshire Blvd. (ER/MFA)
5	Elizabeth Brockhage Residence, 4016 Wilshire Blvd. (ER/MFA)
6	Perino's Restaurant, 4101 Wilshire Blvd. (ER/MFA)
7	Isomoto Residence, 1230 S. Arlington Ave. (AA #084)
8	Zucker Residence, 1056 S. Arlington Ave. (AA #064)
9	Milbank Mansion, 3340 Country Club Dr. (AA #241)
10	McFie Residence, 1130 S. Arlington Ave. (AA #073)
11	Nordlinger Residence, 3401 Country Club Dr. (AA #067).
12	Pico Arlington Christian Church, 3405 W. Pico Blvd. (AA #171)
13	Forum Theatre, 4050 W. Pico Blvd. (AA #108)
14	Norins Residence, 952 Westchester Pl. (AA #044)
15	Windsor Village, 862-941 Victoria Ave., 876-953 Windsor Ave., and 4224 Francis Ave (ER/MFA)
16	Victoria Park District, 4318-4446 Victoria Park Pl., 4300-4439 Victoria Park Dr., and 1312-1524 Victoria Ave. (ER/MFA)
17	West Boulevard Overcrossing, West Blvd. at Venice Blvd. (AA #233)
c	**Historic Properties not Eligible for NRHP but Appearing Eligible for CRHR**
18	William Grant Still Residence, 1262 Victoria Ave. (ER/MFA)
19	Residence at 1178 Victoria Ave. (ER/MFA)
20	Lopez Quadruplex, 3964 W. 7th St. (AA #009)
21	Tuthill Apartment Building, 712 S. Wilton Pl. (AA #015)
22	Ventress Apartment Building, 3781 W. 9th St. (AA #029)
23	Harbeson Residence, 1026 S. Arlington Ave. (#059)
24	Westchester Apartment Building, 3501 W. Pico Blvd. (AA #088)
25	"Bank of America" Building, 4013 W. Pico Blvd. (AA #104)
26	Coyne Building, 1262 Crenshaw Blvd. (AA 114)
27	Bekins Building, 4174 W. Pico Blvd. (AA #115)
28	Kim Residence, 1269 Westchester Pl. (AA #118)
29	Philochristus Pentecoastal Residence, 1255 Westchester Pl. (AA #119)
30	Tachibana Quadruplex, 1326 2nd Ave. (AA #166)
31	Reiman Apartment Building, 4418 W. Pico Blvd. (AA #133)
32	Graham Residence, 1601 S. Victoria Ave. (AA #226)
33	Smith Residence, 3501 Country Club Dr. (AA #245)
34	Varjian Building, 1302 4th Ave. (AA #098)



(List of Historic Properties by number is provided on the following page) (Page 1 of 2)

ULTRASYSTEMS
ENVIRONMENTAL
INCORPORATED

FIGURE 7-41
MAP OF HISTORIC PROPERTY LOCATIONS

Historic Structures Previously Determined Eligible for NRHP

1. Los Altos Apartments, 4121 Wilshire Boulevard (Myra Frank and Associates [MFA])
2. Oxford Square Craftsman District, 1237-1269 Victoria Avenue (MFA)

Historic Properties Appearing to be Eligible for NRHP

3. Wilshire Professional Building, 3875 Wilshire Boulevard (MFA)
4. St. James' Episcopal Church, 3901-3905 Wilshire Boulevard (MFA)
5. Elizabeth Brockhage Residence, 4016 Wilshire Boulevard (MFA)
6. Perino's Restaurant, 4101 Wilshire Boulevard (MFA)
7. Isomoto Residence, 1230 S. Arlington Avenue (AA #084)
8. Zuker Residence, 1056 S. Arlington Avenue (AA #064)
9. Milbank Mansion, 3340 Country Club, Drive (AA #241)
10. McFie Residence, 1130 S. Arlington Avenue (AA #073)
11. Nordlinger Residence, 3401 Country Club Drive (AA #067)
12. Pico Arlington Christian Church, 3405 W. Pico Boulevard (AA #171)
13. Forum Theater, 4050 W. Pico Boulevard (AA #108)
14. Norins Residence, 952 Westchester Place (AA #044)
15. Windsor Village, 862-941 Victoria Avenue, 876-953 Windsor Avenue, and 4224 Francis Avenue (MFA)
16. Victoria Park District, 4318-4446 Victoria Park Place, 4300-4439 Victoria Park Drive, and 1312-1524 Victoria Avenue (MFA)
17. West Boulevard Overcrossing, West Boulevard at Venice Boulevard (AA #233)

Historic Properties not Eligible for NRHP but Appearing Eligible for CRHR

18. William Grant Still Residence, 1262 Victoria Avenue (MFA)
19. Residence at 1178 Victoria Avenue (MFA)
20. Lopez Quadruplex, 3964 W. 7th Street (AA #009)
21. Tuthill Apartment Building, 712 S. Wilton Place (AA #015)
22. Ventress Apartment Building, 3781 W. 9th Street (AA #029)
23. Harbeson Residence, 1026 S. Arlington Avenue (#059)
24. Westchester Apartment Building, 3051 W. Pico Boulevard (AA #088)
25. "Bank of America" Building, 4013 W. Pico Boulevard (AA #104)
26. Coyne Building, 1262 Crenshaw Boulevard (AA #114)
27. Bekins Building, 4174 W. Pico Boulevard (AA #115)
28. Kim Residence, 1269 Westchester Place (AA #118)
29. Philochristus Pentecostal Residence, 1255 Westchester Place (AA #119)
30. Tachibana Quadruplex, 1326 2nd Avenue (AA #166)
31. Reiman Apartment Building, 4418 W. Pico Boulevard (AA #133)
32. Graham Residence, 1601 S. Victoria Avenue (AA #226)
33. Smith Residence, 3601 Country Club Drive (AA #245)
34. Varjian Building, 1302 4th Avenue (AA #098)

(Page 2 of 2)

ULTRASYSTEMS
ENVIRONMENTAL
INCORPORATED

FIGURE 7-41 (CONT.)
MAP OF HISTORIC PROPERTY LOCATIONS

districts appearing to be eligible for the NRHP, and 17 structures appearing eligible for the CRHR but not the NRHP. The following types of structures are included in the list:

3	Residential Districts	2	Quadruplexes
5	Apartment Buildings	1	Theater
5	Office/Storefront Buildings	1	Bridge
2	Churches	14	Residences
1	Restaurant		

Original building permits on file with the City of Los Angeles Department of Building and Safety were reviewed for the aforementioned 34 locations identified as potentially eligible for the CRHR. Unfortunately, many of the permits no longer exist. Furthermore, of those permits that do exist, very few provide architect information.

Reviews of the National Register of Historic Places, California Historical Landmarks and California Points of Historic Interest indicated that no listed properties are situated within the project APE. However, the City of Los Angeles Historical Landmarks includes 3 locations within the APE. These comprise the residence of William Grant Still, the Los Altos Apartments, and the Milbank/McFie Estate. The reader is referred to the RDE for further details.

Descriptions of those properties eligible or appearing eligible for the NRHP are presented in the Section 106 Compliance portion of this SEIS/SEIR (section 7.19.4 below). Descriptions of structures appearing eligible for the CRHR but not the NRHP are presented here:

1. *William Grant Still Residence, 1262 Victoria Avenue.* The building located at 1262 Victoria Avenue was the residence of conductor/composer William Grant Still from 1959 to 1975 and was designated as City of Los Angeles Historic-Cultural Monument No. 169. William Grant Still's accomplishments occurred during the 1930s and 1940s. They included having been the first Afro-American to conduct a major symphony orchestra in the United States (the Los Angeles Philharmonic at the Hollywood Bowl in 1936); have a symphony performed by major orchestras (Afro-American Symphony, 1930); and have an opera produced by a major company (Troubled Island by the New York City Opera in 1949, with choreography by George Ballanchine). Although the building was altered in the mid-1990s and was determined ineligible for the National Register of Historic Places by SHPO because it was not Mr. Still's residence during the time of his most important accomplishments, its status as a city monument makes it potentially eligible for inclusion in the California Register. In 1992, SHPO wrote in it's Determination of Eligibility letter that this building was ineligible unless it could be shown that it is the last remaining building associated with Mr. Still. If Alternative C is chosen as the LPA, further research will be conducted on this building.

2. *Residence at 1178 Victoria Avenue.* This two-story building was built in 1910 and designed in a blend of the Prairie and Mission Revival styles of architecture. The residence does not appear to have sufficient architectural quality or unique character to be eligible for inclusion in the National Register of Historic Places, but it is outstanding in the context of other resources in its vicinity and may be eligible for the California Register.

3. *Lopez Quadruplex, 3964 W. 7th Street.* The Joseph and Consuelo Lopez (current owners) quadruplex is a French Revival two-story stuccoed frame dwelling which was built in 1936 and engineered by J.J. Rees. The L-shaped structure features a high hip roof and an engaged tower in the crotch of the L capped with a cone roof. Quoins decorate the first-story building corners and the second-story casement window opening in the tower. A tall narrow leaded glass lattice window lights the interior staircase on the east wing and a second, smaller lozenge-shaped lattice window lights the second story to the east. Aside from being an excellent example of French Revival architecture, this building's unique fenestration lends it a degree of distinction which may make it eligible for the CRHR.

   However, the structure's setting is crowded and there are other excellent examples of French Revival architecture in the area. For these reasons, the Lopez Quadruplex does not appear eligible for the NRHP.

4. *Tuthill Apartment Building, 712 South Wilton Place.* The Gordon Tuthill (current owner) apartment building is a Tudor Style four-story brick apartment built in 1920. It is one of several brick apartment buildings of the period which share similar plans and elevations but with different decoration. However, the Tuthill apartment is among the most attractive and best-preserved.

   The rectangular building boasts a symmetrical Tudor facade with parapeted cross gable roof and two parapeted gable wall dormers. The first story of the facade is stuccoed and incised to resemble stone block masonry, a Renaissance Revival touch. However the elevated opening to the recessed entrance is Tudor-arched as are four of the first-story French door openings. All remaining apertures are rectangular, most housing pairs of original French doors glazed with five panes each. The apartment building is in good condition and is unaltered except for replacement of several pairs of French doors (the fire-escape over the entrance is believed to be original). This apartment building is an excellent example of its type and may be eligible for listing in the CRHR. However, it does not appear eligible for the NRHP because it is one of several brick apartment buildings in the area.

5. *Ventress Apartment Building, 3781 W. 9th Street.* The Joseph L. Ventress (current owner) apartment building is a Modernistic (Art Moderne) U-shaped stuccoed frame three-story structure built in 1935. It was designed by Lester Scherer who also designed the Our Lady of Lourdes Roman Catholic Church and the Meade House "La Casa de las Campanas" (Gebhard and Winter 1994:188). Its two-story flat-roofed wings feature steel frame structural windows extending around each corner. The corner window arrangements are set in shallow panels which are decorated with parallel horizontal grooves below the parapet. The three-story connector between the wings is decorated with a round opening filled with radiating spokes. Other modernistic features include welded pipe balustrades on the wings and curved pipe guys supporting flat hoods over the second-story apartment entrances. There is said to be a sister structure at 9th and Hobart Blvd. Purely Modernistic structures such as this are not commonplace in the vicinity and this particular example is in very good condition, factors which may make it eligible for the CRHR. Unfortunately, it is not sufficiently unique on the national level to appear eligible for the NRHP.

6. *Harbeson Residence, 1026 S. Arlington Avenue.* The Gartrell M. Harbeson (first assessed owner) house is a rectangular clapboard covered frame structure built in 1915. The structure is basically Colonial Revival in style although with unique qualities. Colonial Revival elements include the Roman Doric columns supporting the central porch roof, the Palladian windows over the porch, and the clapboard exterior. However, the extended eaves of the high hip roof are swept over the lateral bays, conveying the impression of eyebrow dormers reminiscent of some Shingle Style houses. The flaring eaves of the porch roof accent the swept eaves of the main roof. The extended eave over the Palladian windows partially hides their arches which may be a drawback. Also the shed-roofed bay on the north may be an

addition. Insofar as we are aware, this residence is a unique example of experimental architecture and may be eligible for the CRHR.

On the other hand, the house has been altered and architecturally speaking, may not be entirely successful due to the partially hidden Palladian window. For these reasons, it does not appear eligible for the NRHP.

7. *Westchester Apartment Building, 3501 W. Pico Boulevard.* Built in 1926 and designed by Frederick Dunn, the structure is a seven-story Italian Renaissance Style brick building with masonry trim. It is flat-roofed with a prominent cornice featuring regularly spaced modillions. More reserved cornice trims belt the tops of the 6th, 2nd, and 1st stories. The plan of the structure is trapezoidally configured to fit the shape of its corner lot. The facade corner is rounded and decorated with pairs of very slender engaged Ionic columns framing the three corner windows between the 2nd and 6th stories inclusive. An architrave molding spans the engaged columns over the 6th story corner. Similar architrave moldings supported by single engaged columns matching those at the rounded corner are place at the outside corners of the building. Originally, the first and second stories had stuccoed exteriors incised to resemble Renaissance block masonry. Unfortunately, the entire first story has been remodeled with modern commercial steel-frame glass. In spite of the modifications, the Westchester Apartment Building retains its distinctive Italian Renaissance presence and may be eligible for the CRHR. However, the alterations to the first story render it ineligible for the NRHP.

8. *"Bank of America Building," 4013 W. Pico Boulevard.* The Bank of America Building (probably not the original name) is a two-story Spanish Colonial Revival stuccoed brick office/store located on a corner lot. The structure was built in 1932. It is flat-roofed with a parapeted mansard visor roof on the north wing. The parapet of the rounded corner and east elevation is decorated with an ornate frieze of connected voluted swags. Acanthus leaves crown the joins of each swag. A second, wider frieze separates the two stories on the corner and east elevation. This frieze features crests flanked by foliated volutes over the doors and pairs of facing, smiling Assyrian lions flanked by foliated volutes over the windows. The second story of the corner facade is framed by prominent engaged spindles. This caps a pleasing six-window arcaded false bay.

The Bank of America Building is in fairly good condition but earthquake retrofit hardware has damaged the friezes and two windows on the second story of the east elevation are missing. This damage is sufficiently extensive to render the building ineligible for the NRHP. Nonetheless, the structure retains its overall integrity as a fine example of adaptation of Spanish Colonial architecture to a commercial structure. It may be eligible for the CRHR.

9. *Coyne Building, 1262 Crenshaw Bouldevard.* The Coyne Building (name on masonry panel over 2nd story corner window) is a two-story brick office/store located on a corner lot. It was built in 1924. Although simple in design with flat elevations and rectangular fenestration, the parapets feature an elaborate Renaissance Revival cornice trim. The trim decoration consists of a narrow band of foliated scrolls over a band of closely spaced dart-like foliations. False brackets containing a rosette panel over a deeply recessed shell are placed at wide intervals along the cornice. The shells house incandescent light bulbs. Each of the second story windows has a plain stone surround and stone lugsill. An architrave molding containing dart-like florals similar to those on the cornice separates the first and second stories.

Unfortunately, earthquake retrofitting has damaged the decoration to the extent that the building is ineligible for the NRHP. Nonetheless, the structure retains its overall integrity as a fine example of Renaissance Revival architecture in a commercial building and may be eligible for the CRHR.

10. *Bekins Building, 4174 W. Pico Boulevard.* Built in 1928, the Bekins Building is an eight-story Art Deco style concrete storage building located on a corner lot. The facade is dominated by broad vertical bays separated by spire-capped piers. Each broad bay is subdivided into three bays above the mezzanine level by ribs. A frieze of spandrel-like decorative panels, which are segmentally arched at the bottom, stop the vertical lines near the top of the building. Segmentally arched window bays span the main piers across the mezzanine. The first story bays are said to have been modified. The Bekins Building is a rare example of the application of Art Deco style to a storage facility and may be eligible for the CRHR. However, according to the City Bureau of Engineering, the first-story has been altered and the building may not be eligible for the NRHP for that reason.

11. *Kim Residence, 1269 Westchester Place.* The You and Ottgul Kim residence is a 2½ story Italian Renaissance Revival brick structure built in 1909. The street facing elevation of this asymmetrical house is interesting in that it consists of the main rectangular residence at the rear with two offset two-story bays advancing toward the street. The most striking architectural feature is the tiled low hip roof over the front bay. The soffits of the widely extending eaves are supported by pairs of prominent curved brackets. Almost as prominent is a set of three rectangular French windows with matching transoms placed in the center of the middle bay. Rectangular lugsills decorate all windows. A wide flower box on the front bay accentuates the pattern of lugsills. Finally, an arched opening to the porch on the side of the main house enhances the house's Renaissance look. Italian Renaissance residences are rare in the vicinity and the Kim residence is an outstanding example which may be eligible for the CRHR.

However, the setting is poor and the main elevation is not visible from the street. Moreover, Italian Renaissance Revival houses are not rare on the national level. For these reasons, the house does not appear eligible for the NRHP.

12. *Philochristus Pentecostal Residence, 1255 Westchester Place.* Built in 1907, this three-story stuccoed frame residence represents a highly unusual piece of architecture which might best be simply described as exotic. The structure is rectangular in plan with ¾ semicircular bays at each corner. The main hip roof is tiled and has gablets at either end of its ridge. This hip roof has broadly extending eaves which cover the greater part of the separate deck roofs of each of the bays. The narrow space between the main and bay roofs combine with the gablets to lend a distinctly oriental look to the upper elevations of the home.

Each of the three stories of the facade is stepped back to form a porch that spans the entire front of the building. The segmentally arched opening to the first-story entry porch is supported by pairs of heavy undecorated columns with Egyptian caps. The second-story porch features an iron balustrade between short pillars which are placed directly over the first-story porch columns. The third-story porch is covered by a heavy beam trellis resting on four symmetrically placed square piers with plain rectangular caps.

Unfortunately, this structure is in only fair condition, one eave of the main roof having partially collapsed and much of the stucco in need of repair. This residence is a truly unique example of experimental architecture which may be eligible for the CRHR, but its condition is too poor for NRHP eligibility.

13. *Tachibana Quadruplex, 1326 2nd Avenue*. Built in 1924, the Janree Tachibana (name of current owner) quadruplex is a two-story stuccoed frame Spanish Colonial Revival style structure with a symmetrical facade and a deck roof. The facade is dominated by its two-story centrally located porch which is covered by a tiled gable roof. The segmentally arched entry to the first-story porch is flanked by engaged spiral columns with Corinthian capitols. The entry is nicely complimented by a matching pair of segmentally arched openings to the porch above. The arches spring from a single freestanding spiral column with a Doric capitol. A horizontal row of five canales framed in a plain molded panel decorates the parapet to either side of the porch.

    Fenestration to either side of the porch consists of two pairs of rectangular French windows on each story. The first-story window openings are crowned with molded arches enclosing relief foliated volute crests. Although the layout of this quadruplex is similar to many others in the vicinity, the purity of its decorative treatment make it an outstanding example of its type. Its condition is very good. The quadruplex may be eligible for the CRHR as an outstanding example of its type, but does not appear eligible for the NRHP because it is not sufficiently unique.

14. *Reiman Apartment Building, 4418 West Pico Boulevard*. The R. and M. Reiman Apartment Building (name of current owner) is a three-story Tudor style brick structure built in 1927 and designed by J.L. Bibb. It has a flat roof. The most striking feature of its symmetrical facade comprises the elevated Tudor arched stone entrance flanked by massive stone piers which extend up to the base of the parapet. Similar piers on the corners of the facade extend to the top of the parapet. The rectangular French window openings on each story are separated by narrow brick piers which extend to the top of the parapet, thereby dividing it into panels. Each panel to either side of the center is decorated with a foliated crest. The contrast between the brick and the much lighter stone of the parapet and main piers lends a "half-timbered" effect to the buildings appearance. Aside from replacement of the original wood frame French windows with aluminum sliders, the building is in original condition. It may be eligible for the CRHR as a good example of a Tudor style apartment building of its period, but does not appear eligible for the NRHP because of the alterations and because it is not sufficiently unique.

15. *Graham Residence, 1601 S. Victoria Avenue*. The Michael Graham (current owner) residence was built in 1939. J.B. Rawley is listed as the building contractor for this two-story stuccoed frame Spanish Colonial Revival home. Its asymmetrical facade features a small single-story wing extending toward the street. The wing is hexagonal in plan. A unique characteristic is the somewhat massive stuccoed exterior chimney placed on the front of the wing so that it becomes one of the dominating elements of the building's appearance. The recessed entrance on the right is surmounted by a bay crowned by a rather high false gable. Although triangular in form, the gable conveys a definite Mission style feel. A round louvered vent placed in a molded Puebloan cross decorates the center of the gable. The front chimney and false gable balance one another nicely.

    Although we have categorized it as Spanish Colonial Revival because of the complexity of its facade, the Mission style influence on this home's architecture is unmistakable. This home is a unique architectural blend of the two styles and may be eligible for the CRHR. However, it does not represent a classic example of architecture on the national level and does not appear eligible for the NRHP for this reason.

16. *Smith Residence, 3501 Country Club Drive*. The Leavy Smith (current owner) residence is a single-story stuccoed frame Spanish Colonial style structure. It was constructed by owner/architect W.J. Magoon in 1923. The house has a deck roof and crenulated parapet, the latter of which comprises its most distinctive architectural feature. The widely spaced openings between the crenulations are in the shape

of inverted pointed arches, the tops of which are encroached upon by plain rectangular copings. The offset entry porch has two arched openings on the front and an arched entry on the side.

Spanish style tiled visor hoods shelter the porch openings. The crenulated parapet of the porch is lower than that of the main house, a feature which lends a "fortress-like" Moorish appearance to the residence. A wingwall with an arched entry extends into a low wall which encloses the rear yard. The condition of the house is fairly good although its matching garage is in poor condition due to a broken bay lintel. This home, which represents an interesting variation of the usual Spanish Colonial structure, is architecturally unique in the area and may be eligible for the CRHR. However, it does not represent a classic example of architecture on the national level and does not appear eligible for the NRHP for this reason.

17. *Varjian Building, 1302 4th Avenue*. The Louise B. Varjian (current trustee) store/office building is a Neo-Classical two-story stuccoed brick structure on a corner lot. Built in 1927, the building has a flat roof with parapet standing above a prominent architrave cornice. A delicate band of dentils highlights the undecorated frieze. The exteriors of both street elevations are divided into bays by fluted pilasters with Corinthian caps. The first story of each bay housed either an entrance or a store window. Mezzanine level windows stand above the first-story and large rectangular single-pane casements with matching transom light the second-story. Two entry pediments, one on the facade and one on the west elevation, have unfortunately been removed. A shell tympanum over a second, recessed, entrance survives. This building may be eligible for the CRHR as a good example of a Neo-Classical commercial structure of its period, but does not appear eligible for the NRHP due to the damage to its decoration and because Neo-Classical structures of this type are relatively commonplace nationwide.

7.16.2 Project Impacts

Thresholds of Significance Criteria

According to the State CEQA Guidelines, Appendix G, section J, a project will normally have a significant effect on the environment if it will:

> "Disrupt or adversely affect a prehistoric or historic archaeological site or a property of historic or cultural significance to a community or ethnic or social group; or a paleontological site except as a part of a scientific study."

In 1992, PRC §21084 was amended to categorize projects that may cause a substantial adverse change in the significance of an historical resource as projects that may have a significant effect on the environment (PRC §21084.1). "Substantial adverse change" means demolition, destruction, relocation, or alteration such that the significance of an historical resource would be impaired (PRC 5020.1[q]).

CEQA does not explicitly define thresholds of significant effect to determine what degree of demolition, destruction, relocation, or alteration constitutes an impairment of the significance of an historical resource. Assessment of how, and to what degree, a project may "disrupt or adversely affect . . . a property of historic or cultural significance or cause a "substantial adverse change in the significance of an historical resource" is highly dependent upon the existing integrity and the nature of the contributing elements to the resource's significance. It also depends on the sensitivity of these elements to the anticipated impact.

To determine the significance of potential effects, an evaluation was conducted of the project's effect on the historical resource's existing integrity and whether or not such effect would impair the resource's significance.

An examination of how the existing integrity would be affected is appropriate because integrity is the ability of an historic property to convey its significance (National Register Bulletin 15.VIII:44). One of the key requirements for an historic property to be listed in or eligible for the National Register of Historic Places (and therefore automatically qualify for the California Register of Historical Resources) is that it must "possess integrity of location, design, setting, materials, workmanship, feeling, and association" (23 CFR 60.4).

Location is the place where the historic property was constructed or the place where the historic event occurred.

Design is the combination of elements that create the form, plan, space, structure, and style of a property.

Setting is the physical environment of an historic property.

Materials are the physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form a historic property.

Workmanship is the physical evidence of the crafts of a particular culture or people during any given period in history or prehistory.

Feeling is a property's expression of the aesthetic or historic sense of a particular period of time.

Association is the direct link between an important historic event or person and an historic property.

According to National Register Bulletin 15, in order to "retain historic integrity a property will always possess several, and usually most, of the aspects. The retention of specific aspects of integrity is paramount for a property to convey its significance." Among the seven aspects of integrity, *feeling* and *association* are considered least essential in establishing the significance of an historical resource. "Because feeling and association depend on individual perceptions, their retention *alone* is never sufficient to support eligibility of a property for the National Register."

Potential Impacts

Impacts Relating to All Alternatives

The following section summarizes the impact evaluation completed for historic properties found ineligible for the National Register of Historic Places but appearing eligible for the California Register of Historical Resources. Impacts on National Register eligible properties are discussed in the Section 106 Compliance portion of this SEIS/ SEIR.

Generally, the emphasis in the impact analysis is on permanent, long-term impacts to historic resources. Typical potential impacts from public construction projects include demolition, physical alteration, visual obstruction, and the introduction of shade and shadow. Fortunately, current project plans do not require demolition or alteration of any of the potentially significant structures within the study area. Moreover, most of the subway will be built by underground tunneling and will not visually affect the surface (the Venice/San Vicente Station for Alternative B and vent structures for Alternative C may represent an exception; see below).

Additional impacts which must be considered in connection with a subway include noise, vibration, and subsidence. However, it should be noted that impacts connected with subway construction (as opposed to operation) are generally temporary in nature. Short-term disruptions to access, increases in noise and other temporary construction effects are not considered significant in the following impact analysis.

Thus, the principal categories of impacts to be considered here are: (1) visual, (2) noise and vibration resulting from subway operation, and (3) subsidence.

Visual Impacts: Most of the proposed system will be underground, regardless of which alternative is selected. The exceptions are the Venice/San Vicente Station, which might be built partially or entirely aboveground and small aboveground structures connected with the subterranean Olympic/Crenshaw (Alternative C) or Olympic/Arlington Stations (Alternatives A and B), and two vent structures associated with Alternative C.

In the case of the latter two stations, such structures comprise elevator ~~ventilation~~ shafts and entrances. Since the exact locations of these structures are not currently known, their precise effects cannot be evaluated. However, given the relatively small size of entry and ventilation shafts, it is improbable that they would cause a significant visual impact to historic resources. Moreover surface facilities will be designed in such a way as to minimally disturb their urban setting (see 7.16.4 Mitigation Measures, below).

The partially or totally aboveground alternatives for the Venice/San Vicente Station could change the appearance of the entire intersection. However, the closest historic structure to the station site is the West Boulevard Overcrossing which is situated approximately 800 feet to the southeast. The station would be visible from the bridge.

Noise and Vibration: Noise and vibration impact evaluations rely on information presented in Section 7.11 of this SEIS/SEIR. If the proposed ground-borne noise and vibration mitigation measures are implemented, there would be no significant ground-borne noise and vibration impacts on nearby historic properties.

Subsidence: Subsidence represents the most serious potential impact to historic resources resulting from the planned project. Unfortunately, it is not possible to accurately evaluate potential subsidence due to subway construction at any given location because all subterranean conditions are not known in advance. Such factors as moisture content, compaction, and voids in the substrata cannot always be predicted.

All structures subside over time and the critical threshold at which such settling becomes damaging depends upon both the nature of the subsidence and the nature of the structure. With regard to the nature of the subsidence, the important factor is the evenness of the subsidence. A structure which settles evenly all around is far less likely to undergo damage than one which settles more in one area than it does in another. Because they are lighter and more flexible, frame structures are less susceptible to serious damage due to subsidence than are brick structures which are much heavier and more brittle.

Since most of the alignments are within street right-of-ways, the historic resources are contiguous with, but do not overlie, the tunnels. The chances of damaging subsidence occurring along these portions of the alignment are low. However, the chances of such subsidence occurring along the tunnel radiuses, which pass directly under surface, are regarded as substantially higher. Locations where subsidence could be an important factor are identified in the discussion of alignment-specific impacts which follows.

<u>Indirect Impacts Relating to All Alternatives</u>

An interesting side-effect of the presence of new Metro Rail stations is that they tend to cause the value of nearby properties to increase. Consequently, owners may wish to remove old buildings in order to replace them with more commercially valuable structures. ~~Insofar as we are aware, this indirect impact is unavoidable.~~

In the case of the Red Line Mid-City Segment project, this indirect effect could occur in the areas of the Olympic/ Arlington or Olympic/Crenshaw Stations depending upon which alignment alternative is selected (no privately owned historic structures are located near the Pico/San Vicente or Venice San Vicente Station site). The only structure near the Olympic/Arlington Station which might be subject to such an indirect impact is the Zucker residence. The closest historic structures to the Olympic/Crenshaw Station site are those in the Windsor Village.

Impacts According to Alternatives

No Project Alternative

The No Project Alternative would not result in effects on historic resources.

Alternative A (Wilshire/Wilton/Arlington/Pico) Impacts

If Alternative A was selected, the following 19 significant structures (their map number is also provided) would be situated within the area of potential effect:

Wilshire/Wilton Segment

Wilshire Professional Building, 3875 Wilshire Blvd. (#3, NRHP, appears eligible)
Lopez Quadruplex, 3965 W. 7th St. (#20, CRHR, appears eligible)
Tuthill Apartment Building, 712 S. Wilton Pl. (#21, CRHR, appears eligible)
Ventress Apartment Building, 3781 W. 9th St. (#22, CRHR, appears eligible)
Norins Residence, 952 Westchester Pl. (#14, NRHP, appears eligible)
Harbeson Residence, 1026 S. Arlington Ave. (#23, CRHR, appears eligible)

Arlington to Pico Segment

Zucker Residence, 1056 S. Arlington Ave. (#8, NRHP, appears eligible)
Nordlinger Residence, 3401 Country Club Dr. (#11, NRHP, appears eligible)
Milbank Mansion, 3340 Country Club Dr. (#9, NRHP, appears eligible)
McFie Residence, 1130 S. Arlington Ave. (#10, NRHP, appears eligible)
Philochristus Pentecostal Residence, 1255 Westchester Pl. (#29, CRHR, appears eligible)
Kim Residence, 1269 Westchester Pl. (#28, CRHR, appears eligible)
Westchester Apartment Building, 3501 W. Pico Blvd. (#24, CRHR, appears eligible)

Pico Segment

Varjian Building, 1302 4th Ave. (#34, CRHR, appears eligible)
"Bank of America" Building, 4013 W. Pico Blvd. (#25, CRHR, appears eligible)
Forum Theatre, 4050 W. Pico Blvd. (#13, NRHP, appears eligible)
Coyne Building, 1262 Crenshaw Blvd. (#26, CRHR, appears eligible)
Bekins Building, 4174 W. Pico Blvd. (#27, CRHR, appears eligible)
Reiman Apartment Building, 4418 W. Pico Blvd. (#31, CRHR, appears eligible)

Of the structures listed above, all but four stand within the area of potential effect but outside the tunnel and/or station construction alignments. The tunnel radius between Wilshire and Wilton Place will pass under two, namely the Tuthill Apartment Building and the Lopez Quadruplex (Figure 7- 41). The Tuthill Apartment is a four-story brick building~~ which is relatively heavy~~. Alignments A and B entail passing directly under the center of the building. Only a portion of the Lopez Quadruplex overlies the tunnels but even so, there is a potential for impacts due to settling.

The Kim Residence and Westchester Apartment Building stand over the tunnel radius which connects S. Arlington and Pico. Both these structures are brick and the Westchester Apartment Building is large (seven stories). Here again, the potential for impacts due to subsidence must be considered.

Alternative B (Wilshire/Wilton/Arlington/Venice) Impacts

If Alternative B was selected, the list of potentially affected buildings would be identical to Alternative A for the Wilshire/Wilton segment. The six buildings along the remaining two segments are listed below:

Arlington/Venice Segment

Isomoto Residence, 1230 S. Arlington Ave. (#7, NRHP, appears eligible)
Pico Arlington Christian Church, 3405 W. Pico Blvd. (#12, NRHP, appears eligible)
Tachibana Quadruplex, 1326 2nd Ave., (#30, CRHR, appears eligible)

Venice Segment

Graham Residence, 1601 S. Victoria Ave. (#32, CRHR, appears eligible)
Victoria Park District, even numbered addresses from 4434 to 4334 Victoria Park Place; excepting 4400 which is non-contributing. (#16, NRHP, appears eligible as district)
West Boulevard Overcrossing, West Blvd. at Venice Blvd. (#17, NRHP, appears eligible)

The potential for subsidence affecting the Tuthill Apartment Building and the Lopez Quadruplex are the same as for Alternative A since both alternatives share the same tunnel radius between Wilshire and Wilton Place.

The Arlington to Venice radius will not pass directly under any historic structures. However, the Venice Boulevard segment will pass directly under the West Boulevard Overcrossing and the possibility of vibration and/or subsidence must be addressed and fully mitigated~~ damaging the bridge cannot be ruled out~~.

Alternative C (Wilshire/Crenshaw/Pico) Impacts

Alternative C includes a greater length of Wilshire and shorter length of Pico than Alternatives A and B. Thus, the lists of structures change accordingly:

Wilshire/Crenshaw Segment

Los Altos Apartments, 4121 Wilshire Blvd. (#1, NRHP, eligible)
Wilshire Professional Building 3875 Wilshire Blvd. (#3, NRHP, appears eligible)
St. James' Episcopal Church, 3901-3905 Wilshire Blvd. (#4, NRHP, appears eligible)
Elizabeth Brockhage Residence, 4016 Wilshire Blvd. (#5, NRHP, appears eligible)
Perino's Restaurant, 4101 Wilshire Blvd (#6, NRHP, appears eligible)

Crenshaw Segment

Windsor Village, 862-941 Victoria Ave., 876-953 Windsor Ave., 9224 Francis Ave., 4254 Ninth St. (#15, NRHP, appears eligible as district)

William Grant Still Residence, 1262 Victoria Ave. (#18, CRHR, appears eligible)
Oxford Square Craftsman District; 1237-1269 Victoria Ave. (#2, NRHP, eligible)

Pico Segment

Reiman Apartment Building, 4418 W. Pico Blvd. (#31, CRHR, appears eligible)

Alignment C would pass directly under several historic structures on the tunnel radius connecting Crenshaw and Pico Boulevards. These include four houses in the Oxford Square District and the William Grant Still Residence (1262 Victoria Ave.). The addresses of the four residences in Oxford Square are 1246, 1252, 1258, and 1269 Victoria Avenue. One tunnel may also pass under the corner of 1261 Victoria Ave. (also in Oxford Square).

7.16.3 Cumulative Impacts

The Metro Red Line Mid-City Segment is only one element of a planned urban transportation network. When combined with other projects, such as the Metro Red Line Western Extension and the Crenshaw/Prairie Corridor project, cumulative impacts could result. For example, the factors of vibration and subsidence could impact historic resources at other locations where tunneling is required. ~~In locations where surface rails are planned, it could be necessary to move or demolish historic structures to accommodate construction.~~ No cumulative impacts have been documented with other related projects identified in this document.

In order to avoid or mitigate impacts to historic resources in future MTA projects, it will first be necessary to survey the areas of potential effect for the purpose of identifying significant resources. Once the resources are known, the potential impacts can be assessed and avoidance or mitigative measures can be implemented.

Judging by the Metro Red Line Mid-City Segment project, it should be possible to avoid significant impacts to most historic resources during future transportation construction projects. Therefore, it is anticipated the cumulative effects of combined future projects on historic resources will be slight. Moreover, public access to historic resources should be improved by the presence of the transportation system.

7.16.4 Mitigation Measures

1. ~~A Memorandum of Agreement (MOA) was executed for the Metro Rail Project in November 1983 by the State Historic Preservation Officer (SHPO), the Advisory Council on Historic Preservation, the Urban Mass Transportation Administration (now the Federal Transit Administration [FTA]) and the Southern California Rapid Transit District (now the Metropolitan Transportation Authority [MTA]). Following completion of the FSEIR/FSEIS in 1992 and selection of the Mid-City LPA, SHPO determined that the 1983 MOA did not require amending. That~~ The MOA ~~is still in effect, but may~~ will be ~~subject to modification~~ modified commensurate with impacts documented ~~anticipated~~ for this segment of the project. The revised MOA will be monitored for compliance through the Mitigation Measures Status Report (MMSR) submitted quarterly to the FTA. SHPO will also be sent a copy of the MMSR quarterly.

2. MTA will develop project design guidelines to ensure compatibility of station plans with adjacent historic resources. In accordance with the conditions of the MOA, every attempt will be made by the MTA to ensure that new construction will be compatible with the remaining historic properties in terms of scale, massing, color and materials employed and station entrances will be designed for compatibility with the existing urban environment.

3. Subsidence represents the most serious potential impact to historic resources, particularly in the cases of structures standing directly over tunnel alignments. Construction plans call for measures to minimize ground settling and it should be possible to reduce settling impacts to a low level of significance by careful planning and engineering. The MTA will require their tunnel contractor to utilize an EPB TBM (closed faced) to minimize subsidence.

4. As part of the preparation for construction, during final design of the LPA, the MTA will conduct a survey of sensitive structures. It is recommended that vibration monitoring equipment be installed near sensitive uses to ensure that during construction activity, vibration remains well below the 95 VdB threshold for damage to fragile historic buildings. MTA will fit sensitive structures with geotechnical instrumentation and maintain monitoring during construction. If deemed necessary, the MTA will install vibration absorbent track or floating slab track in areas adjacent to the sensitive structures. If required, grouting will also be used to minimize the potential for soil settlement around the tunneling. (Same as mitigation measure #2 in section 7-11.)

5. The MTA will require their contractor to use caution when shoring adjacent to ~~potential for subsidence impact to~~ the West Boulevard Overcrossing ~~will be minimized by use of the cut-and-cover method~~ to ~~build the tunnels. Careful shoring of the excavation escarpments will~~ ensure that contiguous earth does not subside beyond limits that would damage the bridge.

~~6. In the event that adverse impacts should occur in spite of all preventive measures, it may be necessary to implement special mitigative procedures. In this event, a consultant possessing appropriate expertise will be retained by MTA to assess the damage to the resource. This consultant will then confer with the MTA and the SHPO for the purpose of determining what mitigative procedures are needed. These mitigation measures will be implemented by MTA or their contractor in a timely manner.~~

6. MTA staff will work with the Los Angeles City Planning Department staff to encourage owners of historic buildings near station sites to retain the buildings, as situations arise.

7. The MTA will be sensitive to historic structures that are located near to entrance plazas. The design of the entrance plazas will consider how visible surface structures are placed and designed, and colors will be selected to minimize visual impacts to historic structures.

Table 7-65 provides a summary of potential impacts to historic structures an mitigation measures.

7.16.5 Unavoidable Significant Adverse Impacts

Minimal subsidence may represent an unavoidable adverse impact to historic structures along all of the ~~four~~ "build" alternative alignments. Such subsidence could result in cracks in foundations, walls, etc.. No other unavoidable significant adverse impacts to historical resources are anticipated as a result of the proposed project.

Table 7-65
Summary of Potential Impacts to Historic Structures and Mitigation Measures

Alternative	Potential Impacts	Mitigation Measures
All Alternatives	Vibration	Use of vibration absorbent track~~ed~~, use of floating slab track~~ed~~
A	Subsidence Tuthill Apt. Bldg. Lopez Quadruplex Kim Residence Westchester Apt. Bldg.	Careful monitoring during construction, use of grouting
	Visual (Olympic/Arlington Station entrance) Zucker Residence	Use of placement design, & color to minimize visual impacts
B	Subsidence Tuthill Apt. Bldg. Lopez Quadruplex West Blvd. Overcrossing	Careful monitoring during construction, use of grouting
	Visual (Olympic/Arlington Station entrance) Zucker Residence	Use of placement design, & color to minimize visual impacts
C	Subsidence 5 houses in Oxford Square Craftsman District William Grant Still residence	Careful monitoring during construction, use of grouting
	Visual (Olympic/Crenshaw Station entrance) Windsor Village	Use of placement design, & color to minimize visual impacts

7.17 ARCHAEOLOGICAL RESOURCES

Introduction

The purpose of this section is to describe archaeological resources in the project area and to identify potentially significant impacts on archaeological resources associated with project construction. It should be observed that archaeological resources are of two types: prehistoric and historic. Both are addressed below.

7.17.1 Environmental Setting

Archival Search Results

Two records searches were requested from the South Central Coastal Information Center, UCLA. The first, which covers Alignment C, was requested in June 1995. The second, which covered the remainder of the alignments, was requested in December of 1996. An additional one-half mile radius was included in each of the clearinghouse studies. The searches included reviews of:

(1) Archaeological site records (prehistoric and historic);
(2) National, state, and local inventories of architectural/historic resources.

In addition, the Information Center has records of three surveys conducted in the project vicinity (Singer n.d.; Westec 1983; Bissell 1989). The report on each of these projects was reviewed and it was concluded that they addressed only the following three locations with our project area: (1) the segment of Wilshire Blvd. between Western and Crenshaw (Westec 1983), (2) the Wilshire/Western station (Singer n.d.; Bissell 1989) and (3) the Pico/San Vicente station (Bissell 1989).

A collection of old maps of the study area was also compiled and used. These include the following:

1902 15' USGS Santa Monica Topographic Quadrangle
1912 Baist's Real Estate Atlas
1921 15' USGS Santa Monica Topographic Quadrangle
1921 Sanborn Fire Insurance Maps
1926 6' USGS Hollywood Topographic Quadrangle

Finally, the history of the early 20th century development of the project area was studied in considerable detail for historic/architectural purposes (see RDE) and this work had the ancillary value of providing background data for an historical archaeological review.

Field Survey

Relatively few vacant lots exist within the study area. However, the surface of each was examined during the course of the historical resources field research. No indications of prehistoric activity were observed though it should be noted that surface visibility was generally nil due to grass or other vegetation.

The field staff also searched for indications of historical archaeological deposits in excess of 50 years old. Virtually all of the debris noted was modern and no historic archaeological deposits were found.

Prehistoric/Historic Background

Brief sketches of the prehistory and history of the study area are presented in the three sections which follow. More detailed historical backgrounds may be found in the *Request for Determination of Eligibility and Effects Report* (RDE) *for the Metro Rail Red Line Mid-City Extension in the City of Los Angeles, California* (Archaeological Associates, June 1997).

Prehistory

At the time of European contact, our study area was occupied by the Gabrielino Indians. These were a shoshonean-speaking people who came to be known as the "Gabrielinos" because of their association with the Mission San Gabriel Arcangel (Kroeber 1925, Bean and Smith 1978). The precise boundaries of the Gabrielino are unknown, but their territory generally included several of the Channel Islands, the coastal and inland valleys of Los Angeles County, a large portion of Orange County, and parts of Riverside and San Bernardino counties.

According to Kroeber (1925) and Bean and Smith (1978), the Gabrielino Indians occupied the largest amount of land in the most fertile lowland portion of southern California. They are considered to have comprised the most advanced group of prehistoric peoples in southern California, except, perhaps the Chumash, and also among the most wealthy. The Gabrielino's influence stretched as far south as Baja California, as far north as the Yokuts in the San Joaquin Valley, and as far east as the Colorado River. Their dominance was not lasting, however, and most, if not all, of the Gabrielino's died before their culture could be fully studied.

The Gabrielino, like most California Indians, established their villages near permanent water sources such as lakes, springs, and streams. Structures in the village consisted of houses, sweathouses, menstrual huts and a ceremonial enclosure. The houses were dome-shaped and usually constructed of tules and reeds. Sweathouses were small, semicircular earthen structures used as a form of mens' clubhouse. The ceremonial enclosure was located near the chief's house and comprised an open air structure constructed of willow and decorated with feathers, animal skins, and flowers (Bean and Smith 1978:544). The village at Los Angeles was called Yang-na and is thought to have been located in the Civic Center area.

Gabrielino villages were politically autonomous and consisted of non-localized lineages. Their society was divided into three social classes: 1) chiefs and their immediate families in addition to the rich, 2) the middle class, and 3) all others. Each lineage had its own chief and the dominant lineage's leader represented the village (Bean and Smith 1978:543f.). Succession to the position of chief was through the male line and was usually assumed by the chief's eldest son. Responsibilities of the chief included administrating community solidarity and welfare and to care for the sacred bundle. Other duties included acting as arbitrator during disputes, tax collector, leader of war parties, and negotiating peace treaties.

The shaman was also important to each village. Shamans obtained power from the supernatural during dreaming or visions brought on by the ingestion of datura (jimson weed). Shamans had the power to cause or cure illness. In addition to curing, shamans were diviners, supernatural guardians of the sacred bundle (e.g., certain feathers, crystals, bones, etc.), rain makers, and collectors of poison for hunting.

The Gabrielino were a hunting and gathering people. Hunting, butchering, and skinning activities were the responsibility of the men. Small game (rabbits, quail, etc.) were captured through the use of snares, nets, and traps. Larger mammals such as deer, and mountain sheep were hunted with the bow and arrow. On the coast, sea mammals were hunted using harpoons and spears.

The Gabrielino women spent a great deal of their time gathering plant material for use as food, medicine, or manufacture. The most important food staples of the Gabrielino comprised acorns, seeds, berries, and fruit from cacti. Commonly, wooden bowls and baskets served as storage containers for their seeds and other foodstuff.

The processing of plant material generally comprised grinding and pulverizing. These activities were accomplished with the use of mano and metate and the mortar and pestle. Often fashioned from granite, these implements reduced acorns and seeds to a meal or flour-like substance which was baked as a bread or cooked as a porridge or gruel (Balls 1962:12-13).

In addition to the women collecting and preparing the food, they also made baskets. Gabrielino baskets were of the coiled type and usually made from rushes and grasses. Examples of their wares included mortar hoppers, winnowers, and storage baskets.

The Gabrielino were well-known for their use of the raw material, steatite. Obtained from Santa Catalina Island, this soft or "soapstone" material was used in making cooking utensils, pipes, animal carvings, beads and ornaments. It was a common trade item along with shell beads.

The Gabrielinos were believers in the <u>Chingichngish</u> cult. <u>Chingichngish</u> was the Gabrielino name for creator (God). According to Heizer (1968:19), <u>Chingichngish</u> created the world out of chaos, fixing it on the shoulders of seven giants who were specifically created for this purpose. He then created animals and humans. After completing his task, <u>Chingichngish</u> returned to the afterworld. Various stories pertaining to <u>Chingichngish</u> tell of him appearing, pronouncing himself chief, and laying down tribal laws (Johnston 1962:42ff.). However, in all stories, he leaves by ascending to heaven.

Spanish colonization began in earnest in the late 1700s, and the Gabrielino lifestyle deteriorated accordingly. Bean and Smith (1978:541) reported that by 1800 "most Gabrielinos (were either) missionized, dead, or fled to other areas." The great ranchos began to grow up in the years which followed and most of the Gabrielino who were not working at the missions became peasant laborers for the rancheros. By 1900, as a result of introduced disease (smallpox), relocation, and general hardship, the aboriginal way of life had virtually disappeared.

<u>Early History</u>

When Spanish explorer Juan Rodriguez Cabrillo first landed in what is now Los Angeles in 1592, he and his crew observed the native inhabitants involved in a great rabbit drive. The Indians were burning brush along the surrounding hillsides to coerce the wild rabbits from hiding. The ensuing blanket of smoke above the basin prompted the name which was given to the area in the ship's log, *La Bahia de los Fumos*, or "the bay of smoke..."

In the late eighteenth and early nineteenth centuries, the Spanish erected a string of missions for the purpose of converting the Indians to Christianity. Mission San Gabriel was established at Los Angeles in 1771. Ten years later, a four square league area was established as *el Pueblo de la Reina de los Angeles* (Town of the Queen of Angels) by eleven Mexican families under a Spanish grant. The volunteer party consisted of 44 colonists of various races and ages, including farmers, married soldiers, women and children.

After 1821, when Mexico broke with Spanish rule, the ranchos of Los Angeles became a self-supporting agricultural community. The Mexican land grant system was a significant factor in the development of present-day California. A virtually Medieval structure of fiefdoms was established by the rancho arrangement, which led to large parcels of land being held by a small segment of the population (Beck and Haase 1974). The earlier Spanish land grants permitted settlement, however ownership of the property remained with the government.

During the second wave of Southern California land grants, *Rancho Las Cienegas* was granted in 1823 to Francisco Jose Avila (1772-1832). Avila was one of five brothers, four of whom were granted ranchos. Rancho Las Cienegas is a misspelling of cienagas, loosely translated as wet or marshy places. Rancho Las Cienegas--"the swamps," was land grant number 428. The rancho was said to be named for the springs of the Arroyo de los Jardines (which ran roughly south of present-day Wilshire Boulevard) and like other such ranchos, was operated as a farm. The bounds of the rancho extended from present-day Wilshire Boulevard, east of Western Avenue, to Baldwin Hills.

As the rancho system matured, these large farms became increasingly independent, and according to Robert Fogelson,

> [the] rancheros geared production to the immediate requirements of their households, and the ranchos achieved a substantial degree of self-sufficiency. Moreover, the [cattle] herds multiplied so rapidly that the excess hides and tallow were exchanged for goods unavailable in California.

Because of their role in international trade, the ranchero families enjoyed a lifestyle which was impossible for other Angelinos to attain. The rancheros' level of affluence was described as "the style of Spanish grandees" by Don Jose del Carmen Lugo of *Rancho La Canada* (Savage 1955). American and British merchants traded with the rancho families for such items as "...liquor, tea and coffee; linen velveteen and silk; cutlery, crockery and tinwear; ...boots, shoes and jewelry" (Fogelson 1967).

Like many of the other local ranchos, it was the marriage of a daughter, Francisca Avila (c. 1832-1925) to German immigrant Theodore Rimpau that led to the breakup of the 4,000-acre parcel. Rimpau (1826-1913) had come to the United States from Germany, en route to Cuba where he was sent to establish a sugar factory for his father. The younger Rimpau had a business education from Germany, and is said to have spoken six languages. It was on this trip, on a lay-over in New York in 1848, that Rimpau embarked on a trip to California, in search of gold (Friis 1983). Upon his arrival in Los Angeles in 1850, he started a business and married Francisca Avila. That same year, in 1850, California was admitted to the Union and the City of Los Angeles was incorporated.

On what had been the old rancho, the Rimpaus managed a merchantile store, raised cattle, grain and raised a family of seventeen. Over the years of their marriage, the Rimpaus sold off parts of the original rancho. Through the 1850's and 1860's, a sequence of floods and droughts, particularly the Great Drought of 1863-1864, caused famine, and eventually most of the rancheros lost their vast and valuable land holdings. In response to these natural cycles, the Rimpaus moved to Anaheim in 1860, where they established a vineyard and took part organizing the community.

In 1862, half of the Rimpau family's rancho holdings were sold to Louisa Garfias, a member of another old rancho family who quickly resold her part of the Rancho Las Cienegas. By 1875, a section of the rancho was owned by Francis F.P. Temple, the brother of pioneer John Temple. Francis Temple was a partner in an early bank which eventually became the Workman and Temple Bank. The young financial institution soon failed and each of the owners lost their personal property (including parts of Rancho Las Cienegas and other ranchos).

<u>Late 19th and Early 20th Centuries</u>

Through the bank default, part of Rancho Las Cienegas was purchased by Elias J. "Lucky" Baldwin (18__-1909), the colorful Comstock millionaire. Although the land was not profitable for Baldwin, his heirs made their fortunes when the land was subdivided in the early 1920's, and later in oil development. Also in the 1920's, the Rimpau's oldest sons, Adolf, Benjamin and Fred, formed Rimpau Brothers Realty on Pico Boulevard to subdivide the family's remaining rancho land. In 1922, an area of less than one square mile was annexed to the city of Los

Angeles under the Rimpau name. The last remaining part of Rancho Las Cienegas was sold as a 90-acre parcel in 1927.

Thus, the area west of downtown Los Angeles remained mostly farmland up through the late 19th/early 20th centuries. The 1880's real estate boom in Los Angeles largely affected areas to the east and north of the city (Boyle Heights, Lincoln Heights, and Angelino Heights). However, during the 1890's, the real estate market was depressed and it was during this period that the city began looking at the western farmland with an eye toward development. At this time, Arlington Ave. was on the western outskirts of the city and most of our study area remained a part of the Rancho Las Cienegas. The subdivisions of Country Club Heights (1904) and Country Club Park (1906) set the development ball rolling. Victoria Park commenced development between 1905 and 1910.

It is interesting to note that during the first decade of the 20th century, most of the residential development which took place west of Western Ave. was along Pico Blvd. and not Wilshire Blvd. In fact, the 1912 Baist's Real Estate Atlas shows that the area along Pico, particularly in the vicinity of the intersection of Pico and Crenshaw, was fairly well built up by 1912. Only a few structures were located along Wilshire west of Western Ave. at that time.

No doubt, the presence of the Pacific Electric Railroad's Venice Short Line (VSL), (connected downtown L.A. with Venice Beach), which ran along the present alignment of Venice Blvd., had a great deal to do with the tendency to develop along Pico. In fact, real estate developers used the line to advertise that perspective buyers would encounter no commuter problems (Crump 1962:114). The VSL segment along Venice Blvd. had originally been built by the Pasadena & Pacific Railway Company, a predecessor of the Los Angeles & Pasadena interurban line (Interurban 1975:26; Duke 1958:6; Venice Boulevard was called "16th Street" at the time). The main local station, called "Vineyard Junction," was located south of the intersection of Pico and San Vicente Boulevards near the location proposed for the Venice/San Vicente Station.

The Los Angeles & Pasadena adopted "standard gauge" width rails in 1908 so that it could accommodate the biggest cars. "This line immediately became the heaviest traveled beach line out of Los Angeles and retained that distinction for many years." (ibid. [Inter.]). The Pacific Electric Railway Company took over in 1911. The line was immensely popular with beach-goers:

> Under the PE flag, the Venice Short Line continued to be a spectacular performer in hauling crowds to the shore. However, dense traffic encountered in Los Angeles and the rise of competing bus lines gradually caused patronage to drop. The often proposed Vineyard subway would probably have saved this line; without it, the eventual conversion to buses was inevitable. (Ibid.).

In 1925, the Pacific Electric Railway Company proposed to construct the "Vineyard Subway." Consequently, "...had the Vineyard Subway been built, and had this line (Venice Short Line) been four tracked (as it was intended), the Venice Short Line undoubtedly would have become the trunk line of a comprehensive rapid transit system for western Los Angeles" (Ibid.).

The Venice Short Line was permanently closed on Sept. 17, 1950 and the rails were subsequently removed paving the way for the Venice Boulevard of today.

7.17.2 Project Impacts

Summary of Previous Results

Two previous studies of Alternative C concluded that the project would have no potential adverse effects on archaeological resources (LACTC 1992; SCRTD 1987). However, these studies analyzed a mostly deep-bore tunnel alignment. In addition, neither study addressed the issue of historic archaeology specifically. There are no prior archaeological studies of Alignments A and B.

Results of this Study

Prehistoric Archaeology

A reasonably extensive literature review failed to produce evidence that previously recorded prehistoric archaeological sites are present within the study area. This is not surprising since the study area was developed long before archaeological locations were being systematically recorded.

There can be no question that there was a great deal of prehistoric activity in the Los Angeles area, the name and approximate location of the principal village being known and such activity having been ethnographically reported (see 7.17.3.1 above). On the other hand, prehistoric archaeological deposits are typically no more than three feet deep and the chances of such a deposit having survived development of the study area seem remote or nil.

A careful review of old topographic sheets shows that the great majority of the study area consisted of an expansive, relatively flat mesa during late prehistoric time. While such topographically featureless areas may have been used for foraging and the like, they were not normally used as habitation areas. The western edge of the mesa was located at about the point where the West Boulevard Overcrossing passes over Venice Boulevard (fig. 7.17-1). Below this point was a small terrace which was situated below the edge of the mesa but was elevated above the valley floor to the west.

This is a "high probability" location for a prehistoric activity area (particularly a milling site). However, the area of this terrace may have been graded and the chances of an archaeological site surviving under the pavement are remote. This area is described in more detail in the discussion which follows.

Historic Archaeology

The great majority of the study area was developed between 1900 and 1939 and most of the structures and infrastructures (e.g., street and block configurations, etc.) remain unchanged for purposes of historical archaeology. In other words, the streets and buildings are in their original locations. No significant historic archaeologic deposit could have developed in a 20th century urban street alignment. Therefore, project activities such as tunneling and cut-and-cover excavations within street rights-of-way will have no effect on historic archaeological resources.

There is, however, one location where early 20th century historic archaeological material may survive buried beneath the surface. This is the area where the Venice/San Vicente Station (Alternative B) or Pico/San Vicente Station (Alternatives A and C) would be built. The location (Figure 7-42) is contiguous with the north side of Venice Boulevard just west of the West Boulevard Overcrossing. It was the site of the Vineyard Power House built by the Pacific Electric Railway Company (Figure 7-43). The power house comprised an electrical substation which furnished current for the electrical railroad. The power house was built early in the century (prior to 1912) and demolished some time after 1950. It most likely consisted of oil or coal fired boilers which fed steam-powered turbines coupled to electrical generators. The cooling rack (also referred to as a cooling tower) structure was located immediately west of the power house building.

Thresholds of Significance Criteria

In conformance with the requirements of the National Historic Preservation Act (NHPA) as set forth in implementing regulations found at 36 CFR 800, archaeological resources are considered eligible for inclusion in the National Register of Historic Places if they "have yielded, or may be likely to yield, information important in prehistory or history" (Criterion D; 36 CFR 60.4).

State of California law considers archaeological resources to be important when they meet the criteria set forth in Appendix K of CEQA. For the purposes of CEQA, an important archaeological resource is one which:

A. Is associated with an event or person of:
   1. Recognized significance in California or American history, or
   2. Recognized scientific importance in prehistory.

B. Can provide information which is both of demonstrable public interest and useful in addressing scientifically consequential and reasonable or archaeological research questions;

C. Has a special or particular quality such as oldest, best example, largest, or last surviving example of its kind;

D. Is at least 100 years old and possesses substantial stratigraphic integrity; or

E. Involves important research questions that historical research has shown can be answered only with archaeological methods.

Potential Impacts

No archaeological resources which could be adversely affected by any of the ~~four~~ "build" project alternatives have been identified. However, the chances of historic archaeological resources being present in the area around the former site of the Venice Power House ~~(Alternatives B1 and B2)~~ (Figures 7-42 and 7-43) are good. The chances of a prehistoric deposit being present under the pavement west of the power house cannot be discounted. It is, of course, impossible to predict whether such resources might be significant within the meaning of CEQA.

The chances of encountering archaeological resources in all other locations are regarded as remote. Tunneling activities would be taking place well below the depth attained by even the most ancient archaeological deposit. Cut-and-cover operations would take place in street right-of-ways where original street construction would probably have destroyed any prehistoric deposit which may have been present and where historic deposits were unlikely to have developed due to street traffic. Construction of intermediary station entrances would occur in areas where previous construction would have likely destroyed any prehistoric deposit which may have been present and where historic deposits were unlikely to have developed due to the types of uses on the properties.

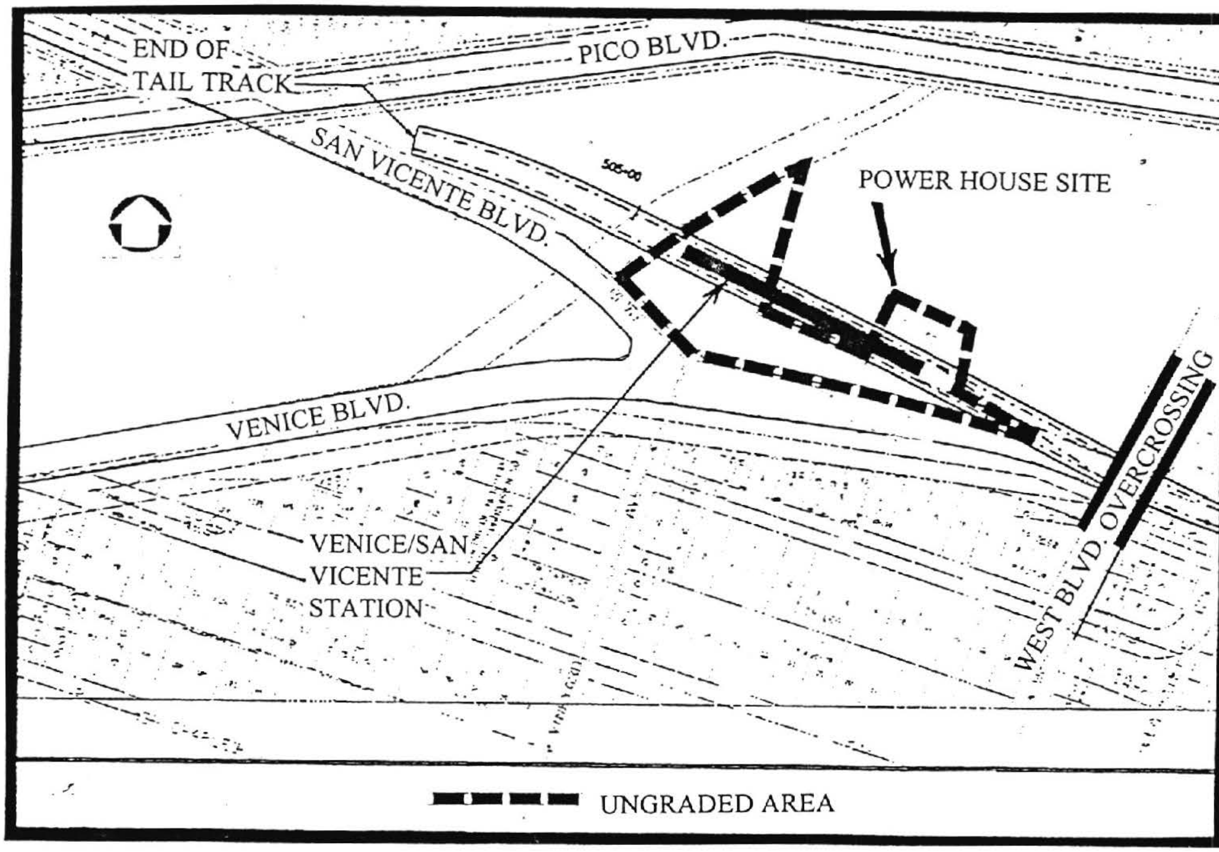


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FIGURE 7-42
MAP OF POSSIBLE ARCHAEOLOGICAL DEPOSITS

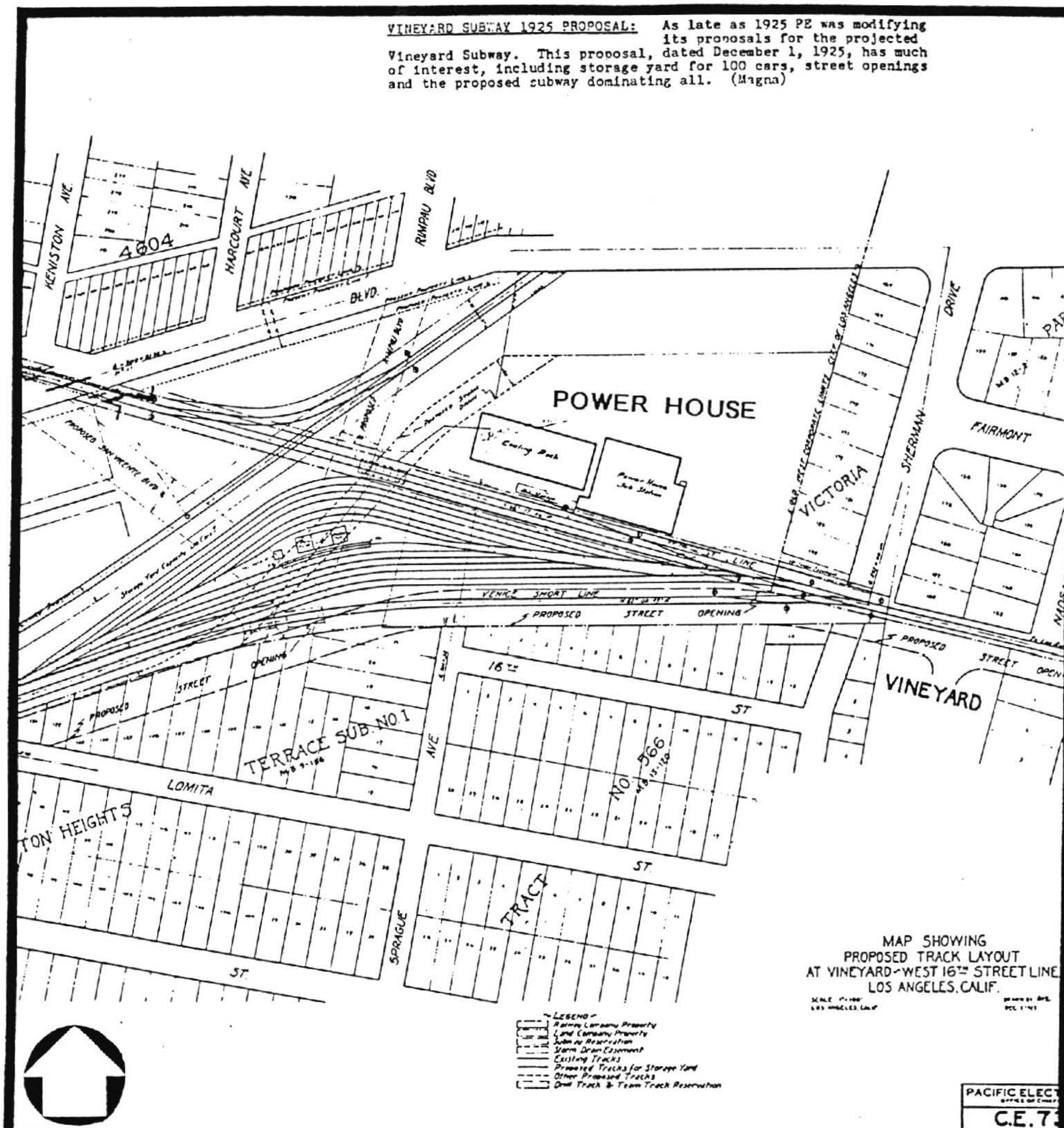

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FIGURE 7-43
MAP OF FORMER PACIFIC ELECTRIC RR POWER HOUSE

7.17.3 Cumulative Impacts

The MTA Red Line Mid-City segment and related public transportation projects affect only narrow corridors insofar as historic resources are concerned. Therefore, while a particular project may affect one or even several archaeological resources, the potential cumulative impact of transportation programs in Los Angeles County is limited. This is because hundreds of archaeological locations exist in the greater Los Angeles area but chances are that only a few of these would be affected by transportation corridors. Of course, some archaeological resources are more significant than others so that it is necessary to deal with each on a case-by-case basis.

No cumulative archaeological impacts are anticipated between the other related projects identified in this document and any of the "build" alternatives.

7.17.4 Mitigation Measures

No significant archaeological resources have been identified within the potential areas of impact of any of the three alignment alternatives. The chances of encountering such resources are regarded as remote except for a single location, namely the site of the Pacific Electric Railway's Vineyard Power House where the Pico/San Vicente or Venice/San Vicente Station is planned. ~~It is recommended that any earthmoving activities at this location be monitored by a qualified professional archaeologist. Alternately, the area will be tested by a qualified archaeologist prior to any grading activities. The purpose of the test will be to determine whether a significant archaeological deposit is present at the location.~~

1 Any earthmoving activities at the site of the Pacific Electric Railway's Vineyard Power House will be monitored by a qualified professional archaeologist. The area will be tested by a qualified archaeologist prior to any grading activities. The purpose of the test will be to determine whether a significant archaeological deposit is present at the location.

2. MTA has a standard construction monitoring plan for archaeological resources with general procedures to be followed during excavation. The detailed monitoring requirements are found in "Scope of Work for Archaeological and Paleontological Monitoring" (SOWAPM) and in MTA's Standard Contract Specification Section 01170 (Archaeological and Paleontological Coordination). The plan describes specific authorities and responsibilities of the project archaeologist (PA), resident engineer (RE), and construction manager; specific procedures for the protection of archaeological resources prior to evaluation and consultation; specific procedures for temporary work stoppage; and specific procedures for archaeological documentation and report preparation.

~~2.~~ Construction Contract Specification 01170 details the process of archaeological resources monitoring and the procedures for protecting and evaluating unanticipated archaeological resources.

3. The procedures outlined in *Treatment Plan for Potential Cultural Resources Within Proposed Metro Rail Subway Station Locations in Metropolitan Los Angeles, California* (SCRTD 1985) will be followed. This plan established general procedures to be followed in protecting archaeological resources encountered during construction, specific procedures for the protection of archaeological resources anticipated at individual station areas, and procedures for handling the discovery of unanticipated resources.

   In general, the procedure to be followed during excavation monitoring is straightforward and involves the construction contractor, the RE, MTA personnel, and the PA (construction monitors). Excavation activities affecting archaeological resources will cease upon the discovery of such resources and the RE will immediately notify the PA. The PA has authority to temporarily halt work in the immediate area to determine whether the discovery is significant. Specific responsibilities for work stoppage can be found in Section 2.3.3 of the SOWAPM. Following notification, the monitors will take actions to evaluate the discovery and provide guidance to the RE on any actions that should be taken to provide appropriate management and treatment research, planning and testing, monitoring, research design, data recovery, reports and records, and curation. For those resources determined to be eligible by the PA, a mitigation plan will be developed in conjunction with SHPO.

4. Mitigation archaeological personnel will meet with appropriate project personnel at each excavation site to instruct project personnel on their responsibilities and the procedures to be implemented if archaeological remains are encountered.

7.17.5 Unavoidable Significant Adverse Impacts

Implementing appropriate mitigation measures would ensure no unavoidable significant adverse archaeological impacts would occur as a result of construction of any of the ~~four~~ "build" alternatives.

7.18 PALEONTOLOGICAL RESOURCES

7.18.1 Environmental Setting

Literature Review

Potential paleontological resources in the general project area are identified in MTA's *Paleontological Resources Technical Report* (SCRTD 1987). Potential resources include fossil remains, fossil sites, and fossil-bearing rock units.

Paleontological Resources

Geologic formations encountered along the project alignment, described in Section 7.15, include artificial fill, younger and older alluvium, the Lakewood Formation, San Pedro Formation, and Fernando Formation. Artificial fill, by definition, consists of various fill materials from other sources and locations. Paleontological resources lose their context, and thus most of their scientific value, if they are moved and mixed. Artificial fill materials therefore would not be anticipated to contain paleontological resources of importance. The shallow elevation of the project alignment would preclude disturbance of the San Pedro and Fernando Formations, except for a small stretch of the alignment in the curve from Wilshire Boulevard to Wilton Place (Alternatives A and B) or Wilshire Boulevard to Crenshaw Boulevard (Alternative C). Paleontological resources likely to be found in younger and older alluvium, and the Lakewood Formation, are described below.

Younger and Older Alluvium

Fossils usually are found in sedimentary material and rock. Thus, fossils in younger alluvium must have been eroded and transported from their original locations. Younger alluvium typically contains no fossil remains and has a low potential for yielding such remains in the project area. Older alluvium, near the La Brea Tar Pits area, has yielded the following paleontological resources: marine invertebrates; land plants; insects; freshwater mollusks; reptiles; birds; and mammals (SCRTD 1987). Based on these occurrences, older alluvium in the project area would have a moderate to high potential for yielding a variety of remains representing diverse taxa.

Lakewood Formation

Along the project alignment, the Lakewood Formation lies between the older alluvium described above and the San Pedro Formation (see Section 7.15.1). Based on geologic formation deposition, the Lakewood Formation's potential for yielding fossil remains during project construction would be expected to be less than that of older alluvium (moderate to high potential) and more than that of the San Pedro Formation [moderate potential; *Paleontological Resources Technical Report (SCRTD 1987)*].

7.18.2 Project Impacts

Significance Criteria and Thresholds

State CEQA Guidelines, Appendix G, states that a project would normally be considered to have a significant effect on the environment if it would disrupt or adversely affect a paleontological site, except as part of a scientific study.

No Project Alternative

Under this alternative, the predicted effects of the project on paleontological resources would not occur.

Alternative A (Wilton/Arlington/Pico)

The disturbance and loss of fossil remains and fossil sites in older alluvium potentially resulting from tunneling and cut-and-cover activities could be a significant impact of project construction. Impacts associated with cut-and-cover excavation could be mitigated to a level of insignificance by the recovery of fossil remains and associated site data from the excavation sites. The older alluvium in the project area would have a moderate to high potential for yielding a variety of remains representing diverse taxa. Based on other paleontological finds in the area, it is expected that the following paleontological resources could be encountered during project excavation activities: marine invertebrates; land plants; insects; freshwater mollusks; reptiles; birds; and mammals.

Alternatives B1 and B2 (Wilton/Arlington/Venice)

Impacts to paleontological resources from deep bore tunneling and cut-and-cover construction of this alternative would be similar to Alternative A. Implementation of this alternative would result in unavoidable significant adverse impacts to paleontological resources.

Alternative C (Crenshaw/Pico)

Impacts to paleontological resources from deep bore tunneling and cut-and-cover construction of this alternative would be similar to Alternative A. Implementation of this alternative would result in unavoidable significant adverse impacts to paleontological resources.

7.18.3 Cumulative Impacts

No Project Alternative

Implementation of the No Project Alternative would not result in any cumulatively significant paleontological resource impacts.

Alternative A (Wilton/Arlington/Pico)

Construction of this project alternative in combination with the related project's listed in Section 6.0 of this document could contribute to the progressive loss of fossil remains and as-yet unrecorded fossil sites. If project-related impacts were properly mitigated, however, cumulative development could result in beneficial effects, including the recovery of fossil remains and associated site data that would not have been recovered without such development.

Alternative B (Wilton/Arlington/Venice)

The cumulative effects of this alternative are the same as described above for Alternative A.

Alternative C (Crenshaw/Pico)

The cumulative effects of this alternative are the same as described above for Alternative A.

7.18.4 Mitigation Measures

The following measures shall be implemented by MTA for the duration of construction to reduce potential impacts on paleontological resources from cut-and-cover activities and deep bore tunnel construction. The measures shall be in compliance with Society of Vertebrate Paleontology (SVP) mitigation guidelines, with the mitigation requirements described in MTA's Scope of Work for Archaeological and Paleontological Monitoring, and with MTA's Standard Contract Specification Section 01170 (Archaeological and Paleontological Coordination).

1. Prior to any earth-moving activity in the corridor, a paleontological resource management consulting firm will be retained by MTA to manage a paleontological resource impact mitigation program. The firm will have experience in conducting similar monitoring and resource recovery programs in areas underlain by rock units containing large and small marine and land mammal remains. Such programs will have included the excavation and proper removal of large mammal specimens and the collection and processing of large samples of fossiliferous rock for smaller vertebrate fossil remains and smaller marine megainvertebrate remains.

2. The mitigation program manager will prepare a treatment plan with a discovery clause to allow for the recovery and processing of an unusually large or productive fossil occurrence that cannot be recovered or processed without diverting program personnel from their own tasks. The treatment plan will specify the procedures and, if possible, the costs associated with rock sample recovery and processing or large specimen recovery and preparation; and identification, curation, and storage of such an occurrence. The discovery clause will specify when and how the treatment plan would be initiated.

3. Mitigation program personnel will meet with appropriate project personnel at each excavation site to instruct project personnel on their responsibilities and the procedures to be implemented if fossil remains are encountered.

4. A paleontological construction monitor will inspect cut-and-cover excavation at each excavation site once excavation has encountered the alluvium below the artificial fill.

5. Monitoring will consist of inspecting excavations and spoils for larger fossil remains. If larger fossil remains are encountered by excavation, the monitor will have the authority to temporarily divert excavation around the fossil site until the remains have been examined, evaluated with respect to importance, and removed — if warranted — before excavation is allowed to proceed through the site.

6. The monitor will spot check the spoils generated by tunneling. If abundant ~~significant~~ fossil remains are encountered, the monitor will have the authority to suspend tunneling until the remains are examined and evaluated, as described above, before tunneling is allowed to proceed through the site.

7. If the monitor is not onsite when fossil remains are encountered, excavation will be diverted around the fossil site until the field supervisor or monitor is called to the site, examines the remains, determines their importance, removes the remains if warranted, and allows excavation to proceed through the site.

8. As part of the monitoring task, the monitor will test screen undisturbed sediment or spoils for smaller fossil remains, when feasible. Tunnel excavation does not allow for test screening of undisturbed sediment or spoils for smaller fossil remains. If smaller fossil remains are found by test screening, the monitor will flag the fossil site to ensure the site is not disturbed by excavation, evaluate the site by additional test screening, and -- if determined sufficiently productive -- recover a sample (not to exceed 6,000 pounds at each excavation site) of the undisturbed sediment or spoils from the fossil site for processing.

9. Fossil sites discovered as the result of monitoring will be plotted on a map of the construction site.

10. Following the completion of monitoring at each excavation site, the program manager will develop a storage maintenance agreement with a local museum to accept the fossil collections from the corridor.

11. Recovered fossil remains or fossiliferous rock samples will be transported to a laboratory facility for processing, preparation, identification, and curation. The specimens and associated geologic and geographic site data will be added into the designated museum repository for permanent storage.

12. The program manager will prepare a final report of findings summarizing the results of the mitigation program and presenting an inventory describing the scientific importance of any recovered fossil remains. The report will be submitted to the MTA and the museum repository, and will signify completion of the paleontological mitigation program.

7.18.5 Unavoidable Significant Adverse Impacts

Impacts to paleontological resources from tunnel boring could not be mitigated to a less than significant level due to the difficulty of detecting and recovering fossil remains and associated data from the tunnels. Impacts to paleontological resources from tunnel boring and other project related excavations could result in unavoidable significant adverse impacts for Alternatives A, B, and C.

7.19 SECTION 106 COMPLIANCE

7.19.1 Introduction

Section 106 of the National Historic Preservation Act of 1966, as amended, requires that federal agencies take into account the effects of their projects on properties in or eligible for inclusion in the National Register of Historic Places. In accordance with this law, and with the guidelines for its implementation promulgated by the President's Advisory Council on Historic Preservation (ACHP), the Federal Transit Administration (FTA) and the Los Angeles County Metropolitan Transportation Authority (MTA) have undertaken an analysis of historic resources that could be affected by the Mid-City subway segment.

Section 106 requires both the identification of National Register eligible properties and the application of the Criteria of Effect and Adverse Effect according to ACHP guidelines (36 CFR Part 800). Because of overlap with California Environmental Quality Act (CEQA) compliance, the results of the eligibility determinations are included in Sections 7.16 and 7.17 above. The results of the application of the effect criteria on eligible properties are discussed below.

7.19.2 Coordination With The State Historic Preservation Office

In accordance with guidelines of the Advisory Council on Historic Preservation [36 CFR Part 800], FTA and MTA have consulted with the State Historic Preservation Officer (SHPO) on various aspects of compliance with Section 106 for the Metro Rail project since 1983.

Initially, only one alignment, Alternative C (Wilshire/Crenshaw/Pico) was being considered for the Red Line Mid-City Segment between the Wilshire/Western Station and the proposed Pico/San Vicente Station. An historic resources investigation was conducted for Alignment C in 1996 (MFA 1996). Alignments A and B were subsequently added as alternatives. Furthermore, an aerial ~~aboveground~~ alternative was ~~were being~~ considered for Alternative C ~~both the Olympic/Crenshaw and Olympic/Arlington Stations~~ during earlier planning stages. The aerial alternative has been abandoned ~~It has now been decided that the interim station will be placed underground~~, thereby greatly reducing the potential for visual impacts to historic resources.

Compliance with Section 106 involves delineation of an Area of Potential Effects (APE). The APE for MTA subway and aerial alternative projects was originally developed under SHPO agreement as part of the June 1983 Los Angeles Rail Rapid Transit Project Draft EIS and EIR. ~~However,~~ The APE definition used in 1983 included the entire aerial alignment, but only the station areas for the subway alignment. ~~for Alternative C of the Mid-City Segment was broadened in~~ The area of the intersection of Crenshaw and Olympic Boulevards was broadened ~~to allow~~ for the aerial ~~aboveground~~ station alternative.

~~A similar situation arose with the Olympic/Arlington station location for Alternatives A and B; the aboveground alternative having since been rejected.~~ Although Alternative C's ~~the~~ widened APE at the ~~alternative~~ intermediary station location has been eliminated, it has been ~~we have~~ included ~~them~~ in this study since the work had already been accomplished. Because the APEs were developed at different times by different investigators, the APEs for Alignment C, and Alignments A and B, are described separately.

For historic and architectural resources in Alignment C, the APE includes:

(1) All property acquired for the project;

(2) All parcels within 200 feet of any cut-and-cover or open-cut construction area or of property acquired for project purposes;

(3) All parcels situated over or adjacent to relocation routes for underground utilities;

(4) All parcels located above or within 50 feet of off-street tunnel configurations, and;

(5) All parcels adjacent to public streets where the alignment is directly under the street.

For historic and architectural resources in Alignments A and B, the APE includes:

(1) All property acquired for the project;

(2) All parcels located above or within 50 feet of off-street tunnel configuration;

(3) All parcels located adjacent to public streets where the alignment is directly under the street;

(4) An area three parcels wide west of the proposed Olympic/Arlington Station.

The APE boundary, which extends a full parcel to the east and west of the tunnel alignments, appears adequate to account for most potential ground-borne and visual impacts in this dense urban environment. It also encompasses areas potentially affected by noise and vibration.

Whenever reasonable, property lines or street rights-of-way were used to establish the APE boundary. In cases of very large structures covering multiple parcels all parcels were included within the APE boundaries.

For archaeological resources, the APE is limited to the area which would be disturbed during construction of the undertaking.

A request for determination of eligibility and finding of effect, as summarized in this document, is being submitted to the SHPO for review and concurrence. Summary documentation will be provided to the ACHP. A letter of concurrence from SHPO shall be included in the Final SEIS/SEIR. In order to avoid or mitigate adverse effects, the 1983 Memorandum of Agreement (MOA) will be amended among FTA, SHPO, ACHP and MTA. A draft MOA will also be included in the Final SEIS/SEIR.

7.19.3 NRHP Eligibility Criteria

Criteria

Generally, listing in the National Register of Historic Places (NRHP) requires that a building, structure or object be at least 50 years old and that it possess "The quality of significance in American history, architecture, archaeology, engineering, and culture ... present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, material, workmanship, feeling, and association ..." and ...

(A). That are associated with events that have made a significant contribution to the broad patterns of our history; or

(B). That are associated with the lives of persons significant in our past; or

(C). That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

(D). That have yielded, or may be likely to yield, information important in prehistory or history. (36 CFR Part 800).

7.19.4 Resources Identified as Eligible or Appearing Eligible

A complete description of background research and field investigation results is presented in the *Request for Determination of Eligibility Report* (RDE). Summaries of the prehistory and history of the APE may be found in section 7.17.3 above. For all alternatives, the historic architectural survey evaluated a total of 545 individual structures. In addition, three districts within the APE were considered. Previously, one building and one district had been determined eligible for the National Register of Historic Places. However, no NRHP-listed resources are present with the APE.

As a result of this survey, 12 additional buildings, a bridge, and two districts were found to appear to meet the criteria for listing in the National Register (Figure 7-44). An additional 17 structures appeared to be ineligible for the National Register but may be eligible for the California Register of Historic Resources (see section 17.16.3.2 for descriptions of these). All other remaining buildings, structures and objects, within the APE have either lost substantial integrity of their historic fabric through alteration or relocation, or are less than 50 years of age and possess no other overriding significance.

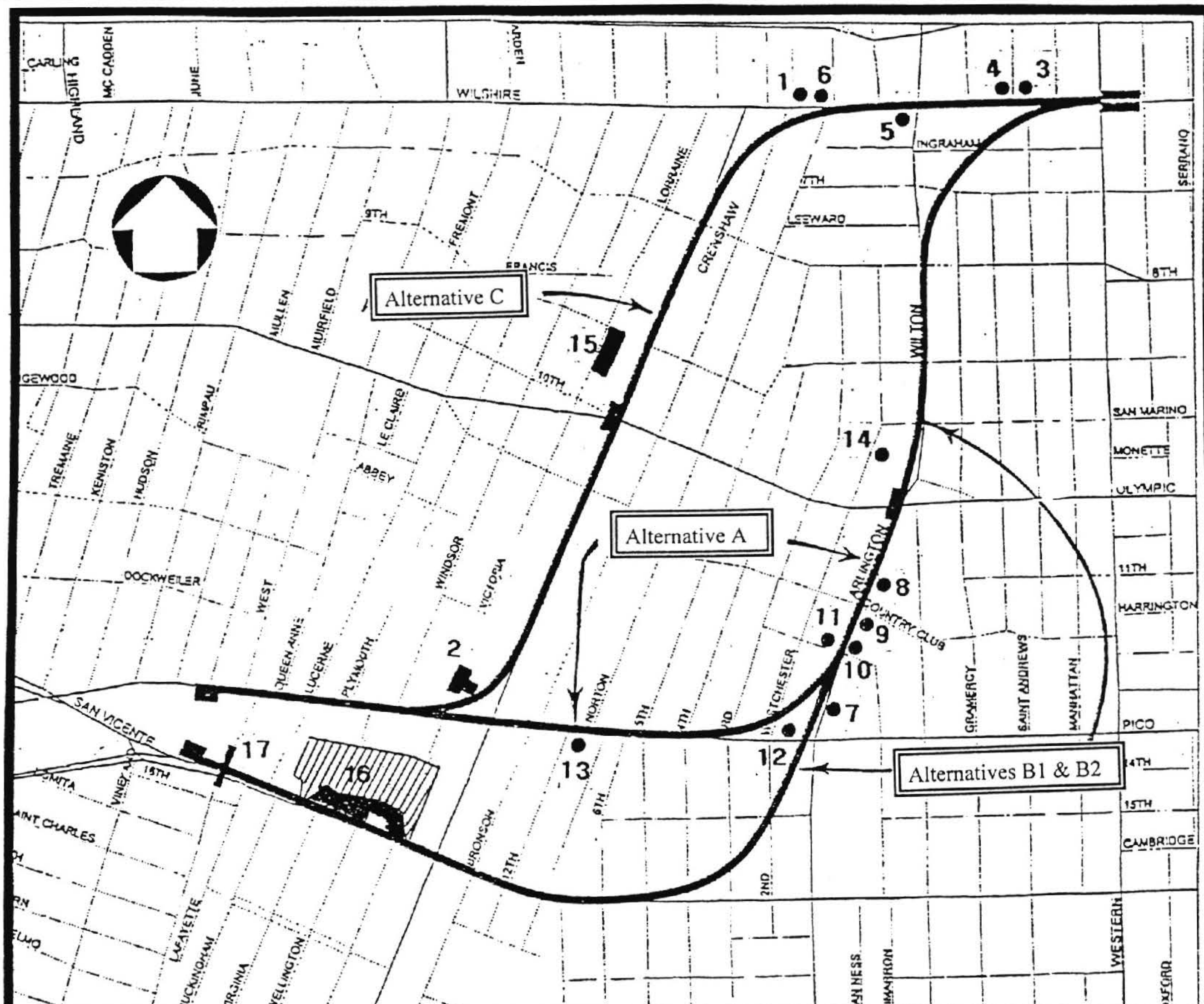
The archaeological study prepared for this project identified no known locations eligible for listing in the NRHP (see section 7.17 above for a description of the archaeological study). Moreover, it concluded that, in all probability, no archaeological resources have survived urban development of the study area with the exception of a single location, namely the former site of the Pacific Electric Railway's Vineyard Power House located off Venice Boulevard at the approximate location of the Venice/San Vicente Station (Alternative B, see Figures 2-5 and 2-6). The historic properties requiring compliance with Section 106 are listed below.

Historic Structures Previously Determined Eligible

The following properties were determined eligible for listing in the NRHP through a consensus determination by the LACTC (now the MTA), FTA, SHPO, and the ACHP.

1. **Los Altos Apartments, 4121 Wilshire Boulevard, Los Angeles** : The Los Altos Apartments were determined eligible for inclusion in the NRHP on August 12, 1992 through a consensus determination by FTA and the SHPO for the *Metro Rail Red Line Mid-City Segment 1992 Final SEIS/SEIR.* The Los Altcs Apartments were determined to meet Criterion C at the local level of significance for the quality of its Spanish Colonial Revival/Italianate design and as the greatest lifetime achievement of local architect E.B. Rust. The five-story building was constructed by developer/contractor Luther T. Mayo and attracted several motion picture personalities as tenants, including Marion Davies, Clara Bow, and Una Merkel. The Los Altos Apartments have also been designated City of Los Angeles Historic-Cultural Monument #311.

2. **The Oxford Square Craftsman District, 1237-1269 Victoria Avenue, Los Angeles** : The district was also determined eligible for inclusion in the National Register for the 1992 *Metro Rail Red Line Mid-City Segment Final SEIS/SEIR.* The Oxford Square Craftsman District, consisting of nine contributors, was determined to meet Criterion C at the local level of significance as a good example of a group of two-story Craftsman style or Craftsman influence buildings. The district includes the residences at: (west side) 1237



(a) Historic Structures Previously Determined Eligible for NRHP

1. Los Altos Apartments, 4121 Wilshire Blvd.
2. Oxford Square Craftsman District; 1237-1269 Victoria Ave.

(b) Historic Properties Appearing to be Eligible for NRHP

3. Wilshire Professional Building, 3875 Wilshire Blvd. (E-R, MFA)
4. St. James' Episcopal Church, 3901-3905 Wilshire Blvd. (MFA)
5. Elizabeth Brockhage Residence, 4016 Wilshire Blvd. (MFA)
6. Perino's Restaurant, 4101 Wilshire Blvd. (MFA)
7. Isomoto Residence, 1230 S. Arlington Ave. (AA #084)
8. Zucker Residence, 1056 S. Arlington Ave. (AA #064)
9. Milbank Mansion, 3340 Country Club Dr. (AA #241)
10. McFie Residence, 1130 S. Arlington Ave. (AA #073)
11. Norlinger Residence, 3401 Country Club Dr. (AA #067).
12. Pico Arlington Christian Church, 3405 W. Pico Blvd. (AA #171)
13. Forum Theatre, 4050 W. Pico Blvd. (AA #108)
14. Norins Residence, 952 Westchester Pl. (AA #044)
15. Windsor Village, 862-941 Victoria Ave., 876-953 Windsor Ave., and 4224 Francis Ave. (MFA)
16. Victoria Park District, 4318-4446 Victoria Park Pl., 4300-4439 Victoria Park Dr., and 1312-1524 Victoria Ave. (MFA)
17. West Boulevard Overcrossing, West Blvd. at Venice Blvd. (AA #233)

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FIGURE 7-44
LOCATIONS OF ELIGIBLE AND POTENTIALLY ELIGIBLE SECTION 106 PROPERTIES

(built 1919); 1243 (built 1908); 1247 (built 1926); 1253 (built 1908); 1261 (built 1909); 1269 (built 1903); (east side) 1246 (built 1908-1909); 1252 (built 1907-1909); and 1258 (built 1910).

Historic Properties Found to Appear Eligible

The following properties appear to be eligible for listing in the NRHP but will require a consensus determination from the State Prehistoric Preservation Officer:

3. **Wilshire Professional Building, 3875 Wilshire Boulevard, Los Angeles**: The Wilshire Professional Building appears to be eligible at the local level of significance under Criterion C, as an excellent example of an Art Deco style commercial office building. In 1929, Preston Wright and Associates commissioned architect Arthur E. Harvey to design the 13-story Wilshire Professional Building and contracted Luther T. Mayo, Inc. to build it for an estimated construction cost of $500,000.

4. **St. James' Episcopal Church, 3901-3905 Wilshire Boulevard, Los Angeles**: The St. James' Episcopal Church appears to be eligible at the local level of significance under Criterion C, as a good example of Gothic Revival ecclesiastical architecture designed by architect Benjamin G. McDougall from 1921 until its construction was completed in 1926. St. James' Episcopal Church was constructed by the Anton Johnson Company for an estimated construction cost of $200,000.

5. **The Elizabeth Brockhage Residence at 4016 Wilshire Boulevard, Los Angeles**: The Brockhage residence appears to be eligible at the local level of significance under Criterion C, as one of the last remaining examples of the once-common residential architecture found along Wilshire Boulevard. Built in 1917, it was designed in an eclectic interpretation of French Revival.

6. **Perino's Restaurant, 4101 Wilshire Boulevard, Los Angeles**: Perino's Restaurant appears to be eligible at the local level of significance under Criterion A, for its association as a social gathering place for the Hollywood elite during the 1920s and 1930s. Along with Musso Frank's and the Formosa Cafe, Perino's is one of the last remaining examples of a popular restaurant during Hollywood's golden era. Other examples, such as the Brown Derby and Chasen's, have been or are proposed for demolition.

7. **Isomoto Residence, 1230 S. Arlington Avenue, Los Angeles**: Built between 1912 and 1921, the Isomoto residence appears to be eligible at the local level of significance under Criterion C as an excellent example of Tudor Revival residential architecture. The building, which is accompanied by a matching carriage house, is in very fine condition. Its elaborate chimney design, prominent structural half-timbered gables, and multiple multi-pane sashes fully convey the Tudor aura. The well-landscaped grounds seem to preserve the original setting. While Tudor residences are not rare in Los Angeles, this outstanding example is strikingly well-designed and well-preserved.

8. **Zucker Residence, 1056 S. Arlington Avenue, Los Angeles**: Built in 1923 and designed by H.E. Chadwick, the Zucker house is a two-story stuccoed frame structure which is broadly semicircular in plan. Aside from the unusual plan, the house is fundamentally Spanish Colonial Revival in style. Its low hip roof with virtually no overhang, second-story engaged slender spiral columns, and arched French door and window openings may all be interpreted as Spanish Colonial Revival elements.

   On the other hand, the facade would be symmetrical were it not for a set of three rectangular casement windows on the second-story west of the door. The central entrance and French doors above are embrasured within a fairly massive surround which is capped with a Mission-like (or Baroque?) parapet on the eave of the roof. The eclectism of this structure is unique in our experience and may make the structure eligible at the local level of significance under Criterion C.

9. **Milbank Mansion, 3340 Country Club Drive, Los Angeles**: This Italianate/ Beaux Arts mansion was designed and built by G. Lawrence Stimpson who also designed the Wrigley Mansion in Pasadena (current headquarters for the Tournament of Roses). It was built for Isaac Milbank, President of Country Club Park, in 1913-14. Milbank was former Director of the Pacific Mutual Life Insurance Co., President of Union Oil Associates, and Vice President of the Pacific Finance Corporation. The building, which is unaltered, is elevated on spacious, well-landscaped grounds. The estate is said to be "the most substantial residential estate in the City of Los Angeles designed at a single time for a single family and surviving intact from a period before WW I" (The Los Angeles Conservancy 1987). The mansion appears eligible at the local level of significance under Criterion C.

10. **McFie Residence, 1130 S. Arlington Avenue, Los Angeles**: This American Colonial Revival two-story house was also designed by G. Lawrence Stimpson, this time for the daughter of Isaac Milbank (see #7 above). Built in 1922, it stands on the same grounds as Milbank's mansion and, while strikingly different from the mansion in appearance, features similar Corinthian capped pilasters (a signature of Stimpson's). Aside from the mansion and architect, the building stands alone as one of the most impressive local examples of American Colonial Revival architecture in the area. Consequently, it appears eligible at the local level of significance under Criterion C.

11. **Nordlinger Residence, 3401 Country Club Drive, Los Angeles**: Built in 1922, Melville Nordlinger was the first assessed owner of this Spanish Colonial Revival single-story residence which was designed by Harley Bradley. Although modest in scale, the Spanish Colonial Revival architecture of this corner residence is exceptionally pure on a "mini" scale. Its asymmetrical facade is dominated by a central square tower with original stained glass window depicting a Mediterranean landscape. Other features include a wingwalled entry court, canales, and engaged spindles in the window mullions. Aside from window awnings, the structure appears to be original and is in excellent condition. The Nordlinger residence appears eligible at the local level of significance under Criterion C as an outstanding example of single-story Spanish Colonial Revival residential architecture.

12. **Pico Arlington Christian Church, 3405 W. Pico Boulevard, Los Angeles**: Completed in 1927, this concrete Spanish Colonial Revival church was designed by Harold Cross and A.F. Wicker. Cross was a noted inventor and President of the L.A. City and County Christian Endeavor Unions. The top of the 75 foot belfry and the frontispiece entrance "employ detailing derived from the Spanish Renaissance." (Gebhard & Winter 1994:200). The interior features massive beams, Malibu tile, stenciling, and stained glass. The church is unaltered and in good condition. It appears to be eligible under Criterion C based on its architectural quality and association with well-known Los Angeles architects.

13. **Forum Theatre, 4050 W. Pico Boulevard, Los Angeles**: Built between 1921-1924 and designed by Edward J. Borgmeyer. Gebhard and Winter call this concrete building "The most refined example of a Beaux Arts theatre still standing in Los Angeles... Two pedimented porticoes enclose a six-columned entrance porch... The fluted Corinthian columns, the cornices, entablatures, and the engaged piers are all richly decorated." (1994:200). The Forum Theatre has suffered from vandalism but appears basically sound (it is now serving as a Korean Christian church). It appears eligible at the local level under Criterion C as the outstanding surviving example of a Beaux Arts theatre.

14. **Norins Residence, 952 Westchester Place, Los Angeles**: The M. Norins (first assessed owner) residence is a French Revival two-story stuccoed frame house built in 1923. Notable architectural features include

high hip roof with flaring eaves, a symmetrical facade with hip-roofed wall dormers flanking a central shed roofed wall dormer over the entrance, and Roman doric porch. Labels are placed above the first-story French windows. The extended eaves may represent an adaptation of the style to the southern California climate. This house, which appears to be unaltered and is in fine condition, was designed by noted architect Edward B. Rust who also designed several other hotels and apartment buildings in Los Angeles (see #1, Los Altos Apartments, above). The Norins residence appears to be eligible at the local level under Criterion C on the basis of its architectural quality and association with a well-known architect.

15. **Windsor Village, 862-941 Victoria Avenue, 876-953 Windsor Avenue, and 4224 Francis Avenue, Los Angeles**: The Windsor Village appears to be eligible at the local level of significance under Criterion C, as a good example of a 1910s-1920s revival style neighborhood which has largely retained integrity. Although such neighborhoods are still relatively common in this portion of Los Angeles, the Windsor Village group stands out because of the quality of its architecture, set back, and consistent street landscaping with large palms. The district consists of 57 contributing features and one non-contributing feature, and is located along both sides of Victoria Avenue and Windsor Avenue, south of Francis Avenue and about four parcels north of Olympic Boulevard.

16. **Victoria Park District, 4318-4446 Victoria Park Place, 4300-4439 Victoria Park Drive, and 1312-1524 Victoria Avenue, Los Angeles**: Victoria Park appears to be eligible at the local level of significance under Criterion C, as a good example of a 1900s-1920s Craftsman and revival style neighborhood which has largely retained integrity. The district was identified as potentially eligible for inclusion in the National Register of Historic Places as a result of the 1991 survey of the West Adams-Baldwin Hills-Leimert District Plan Area conducted for the Los Angeles Department of City Planning.

    The district consists of 58 contributing features and 12 non-contributing features and is generally located southwest of the intersection of Pico and West Boulevards. Although other neighborhoods similar in period of significance and architectural style are still relatively common in this portion of Los Angeles, the Victoria Park District features exceptional examples of Craftsman architecture and a high quality of revival architecture, a rare oval street pattern, and consistent two-story scale, set back and period of construction.

17. **West Boulevard Overcrossing, West Boulevard over Venice, Los Angeles**: Built and designed by the City of Los Angeles in 1933, the reinforced concrete double arched West Boulevard Bridge is historic because it originally spanned the Pacific Electric Railroad's Venice Short Line tracks ([VSL]; see section 7.17.3 above. The brackets for the VSL overhead power lines may still be seen on the northerlymost arch). The presence of the VSL was a major contributing factor to the development of the region and it was probably this development which led to the need for the bridge (Sanborn maps show it replaced a much smaller earlier version). The bridge has been in constant use since its construction and now spans Venice Boulevard, two lanes in each direction.

    Architecturally, the bridge may not appear special at first glance. However, it incorporates some very fine features which become apparent upon close scrutiny. First, and perhaps most important, the bridge spanned a gap between two roadways which existed at different elevations, and which were not located directly across from one another vis-a-vis the rail alignments. Moreover, neither roadway was the same width. The challenge facing the architect was to achieve a harmonious, apparently symmetrical span which was entirely asymmetrical in actuality. His solution to the problem was to place each of the elliptical spanning arches within a single broad elliptical arch which appears to extend across the entire length of the bridge. Yet even this apparent symmetry is illusory since the latter ellipse actually springs from the northern supporting arch.

The details of the bridge are also impressive. The arcaded rails are characteristic of bridges of the period but the top of an undecorated frieze below undulates in regular waves which imperceptibly accentuate the arched openings of the rails. The bottom of the frieze is finished with a band of dentils, the interstices of which correspond with the rail openings. Also special are two staircases located on the east face of the northern approach ramp. The landing of the larger is supported by three massive, closely spaced scrolled braces with scalloped molding under rectangular caps.

The roadway is lit by bronze lanterns on fluted columns standing on slender hexagonal pedestals which are stepped back near the top. Each of the four pylons at the abutments bears such a lantern. Three additional lights top piers elsewhere and one very large lantern lights the larger of the two staircases on the northern approach ramp.

Although Caltrans records indicate that the West Boulevard Overcrossing was altered in 1962, careful scrutiny in the field failed to reveal evidence of even minor changes in the architecture. Consequently, we conclude that the alterations were to the roadway or of some other type not affecting the integrity of the original structure.

Relatively few bridges from the period survive in Los Angeles and the West Boulevard Bridge, which is in good condition, certainly must be rated as an outstanding example. Coupled with its history we believe the bridge may be eligible for the NRHP under both Criteria A and C.

7.19.5 Application of the Criteria of Effect

Any effects on historic properties listed in, or determined eligible for, the National Register must be reviewed for compliance with Section 106 using the rules and regulations found in 36 CFR Part 800.9 of the NHPA regarding Criteria of Effect and Adverse Effect. These criteria were developed by the ACHP and are as follows:

Criteria of Effect

"(a) An undertaking has an effect on a historic property when the undertaking may alter characteristics of the property that may qualify the property for inclusion in the National Register. For the purpose of determining effect, alteration to features of a property's location, setting or use may be relevant depending on a property's significant characteristics and should be considered." [Section 800.9(a)]

Criteria of Adverse Effect

"(b) An undertaking is considered to have an adverse effect when the effect on a historic property may diminish the integrity of the property's location, design, setting, materials, workmanship, feeling or association. Adverse effects on historic properties include, but are not limited to:

(1) Physical destruction, damage, or alteration of all or part of the property;
(2) Isolation of the property from or alteration of the character of the property's setting when that character contributes to the property's qualification for the National Register;
(3) Introduction of visual, audible, or atmospheric elements that are out of character with the property or alter its setting;
(4) Neglect of the property resulting in its deterioration or destruction; and
(5) Transfer, lease, or sale of the property."

Exceptions to the Criteria of Adverse Effect:

"(c) Effects of an undertaking that would otherwise be found to be adverse may be considered as being not adverse for the purpose of these regulations:

(1) When the historic property is of value only for its potential contribution to archaeological, historical, or architectural research, and when such value can be substantially preserved through the conduct of appropriate research, and such research is conducted in accordance with applicable professional standards and guidelines;

(2) When the undertaking is limited to the rehabilitation of buildings and structures and is conducted in a manner that preserves the historical and architectural value of affected historic property through conformance with the Secretary's "Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings;" or

(3) When the undertaking is limited to the transfer, lease or sale of a historic property, and adequate restrictions or conditions are included to ensure preservation of the property's significant historic features." [36 CFR Section 800.9]

Findings of No Effect

The No Project Alternative would have no effect on historic resources.

1. All Alternatives

Tunnels under Existing Street Alignments. The project would have no effect on historic structures at locations where the system would be comprised of tunnels under existing street alignments. This is because the tunnels would be bored underground and there would be no surface construction activity, thereby precluding any physical damage, destruction, or alteration. There would be no isolation or alteration of any properties' setting because no property's setting extends below the ground surface. The subsurface configuration also precludes the possibility of the introduction of visual elements. Finally, no impacts due to ground-borne noise and vibration have been projected for this portion of the project (see Section 7.11). The remaining Criteria of Adverse Effect, regarding neglect and transfer, lease, or sale, are not applicable for the portions of the project in tunnel configuration and outside station area construction activity.

Finally, the factor of surface subsidence caused by tunneling is not regarded as potentially significant except at radius locations where the tunnels will curve under developed property. The historic structures subject to the finding of No Effect are listed in Table 7-66.

2. Alternatives A and B

Olympic/Arlington Station. Construction of this interim station alternative will have no effect on historic resources because it will be underground and there are no historic properties located adjacent to the construction site. The closest potentially eligible property is the Zucker Residence located about 50 feet to the south of the southern end of the station. This residence is well set back from the street and its setting would not be disturbed.

3. Alternatives A and C

Pico/San Vicente Station. Construction of this underground station would have no effect on historic resources because no such resources are located near the construction site. The closest potentially eligible property is the West Boulevard Overcrossing located 700 feet to the southeast.

Table 7-66
National Register Eligible and Potentially Eligible Structures and Districts for Which There Is a Finding of No Effect

1	Los Altos Apartments, 4121 Wilshire Boulevard.
2	Wilshire Professional Building, 3875 Wilshire Blvd.
3	St. James' Episcopal Church, 3901-3905 Wilshire Blvd.
4	Elizabeth Brockhage Residence, 4016 Wilshire Blvd.
5	Perino's Restaurant, 4101 Wilshire Blvd.
6	Isomoto Residence, 1230 S. Arlington Ave.
7	Zucker Residence, 1056 S. Arlington Ave.
8	Milbank Mansion, 3340 Country Club Dr.
9	McFie Residence, 1130 S. Arlington Ave.
10	Nordlinger Residence, 3401 Country Club Dr.
11	Pico Arlington Christian Church, 3405 W. Pico Blvd.
12	Forum Theatre, 4050 W. Pico Blvd.
13	Norins Residence, 952 Westchester Pl.
14	Victoria Park District, 4318-4446 Victoria Park Pl., 4300-4439 Victoria Park Dr., and 1312-1524 Victoria Ave.

4. Alternative B

Venice/San Vicente Station and Victoria Park. The Venice/San Vicente Station will be built either as an open air or aboveground (i.e., elevated) facility located about 300 feet west of the westernmost edge of the Victoria Park District. However, the station would not be visible from the district because it would be built at a significantly lower elevation and because existing structures block the view from Victoria Park westward.

Findings of No Adverse Effects

1. Alternative B

West Boulevard Overcrossing and Venice/San Vicente Station. The Venice/San Vicente Open Air (on a Berm) Station would be visible from the West Boulevard Overcrossing (the station would be built north of Venice Boulevard about 300 feet west of the bridge). Construction of the station is not regarded as a potential adverse visual effect for two reasons. First, the bridge has always been in a dynamic urban setting and the presence of the Red Line station would do nothing to change that. In fact, the station would be built on the site of the former Pacific Electric R.R. power house, a very large two-story structure which was demolished some time after the bridge was built. Second, the station would be built at a much lower elevation so that its presence would not significantly affect the landscape setting of the bridge.

2. Alternative C

Windsor Village and the Olympic/Crenshaw Station. The Olympic/Crenshaw underground station would be built underground which would involve relocation of underground utilities to Ninth Street. The cut-and-cover construction of the Ninth Street utility relocation would necessitate acquisition of both 900 and 902 Victoria Avenue, a temporary move of the buildings off their lots during construction, and a return to their original settings after construction is completed. Construction may require grading of part of the properties; however, the site topography would be returned to its original condition before the buildings were moved back.

> The MTA, acting on behalf of the FTA, shall ensure that each property is moved in accordance with the approaches recommended in *Moving Historic Buildings* (John Obed Curtis, 1979, American Association for State and Local History), in consultation with the SHPO, by a professional mover who has the capability to move historic structures properly. The MTA shall ensure that both 900 and 902 Victoria Avenue are properly secured and protected from vandalism and weather damage for the period during which each is unoccupied. The buildings will be returned to their original locations and orientations after construction of the station is complete.
>
> The effects of the undertaking would be limited to the transfer, lease, or sale of two contributing features of a much larger district. Adequate restrictions or conditions to ensure preservation of the property's significant historic features will be included in stipulations to the Memorandum of Agreement for this project for the two features to be temporarily moved and in a preservation covenant for properties to be acquired but not altered. For these reasons, the effects of the project on the Windsor Village District would be an *Exception to the Criteria of Adverse Effect*, according to the conditions set forth in 36 CFR 800.9(c)(3). Provided these restrictions and stipulations are adopted as mitigation for Alternative C, the project would have no substantial adverse effect upon the historic resource identified as the Windsor Village District.

Findings of Potential Adverse Effects

1. Alternative A

Construction of Alternative A would not adversely affect NRHP-eligible historic properties.

2. Alternative B

West Boulevard Overcrossing and the Venice Segment of Alternative B. The twin tunnels (constructed within cut-and-cover concrete box structures) of the Venice Boulevard alignment would pass directly under the arches of the West Boulevard Overcrossing at a top-of-tunnel depth of only about 15 feet. Since a bridge is not a habitational structure, noise impacts would not affect its integrity as a resource.

However, the factors of vibration and subsidence may ~~both~~ represent ~~serious~~ potential impacts to the bridge since they could affect its structural integrity. Fortunately, one possible solution to the vibration problem may lie in the use of special ~~Whether vibration effects could be adequately mitigated by~~ features such as high-resilience track fasteners and floating slab trackbed ~~is uncertain (see section 7.11)~~.

The tunnels under the bridge would be installed using the cut-and-cover (i.e., excavating open trenches, constructing the tunnels, and backfilling) method. Because the open excavations would be strongly reinforced by shoring, the potential effect of subsidence would be minimized.

3. Alternative C

Oxford Square Craftsman District and Crenshaw/Pico Radius in Alternative C: If Alternative C were selected, the radius of the tunnels near the intersection of Pico and Crenshaw Boulevards would pass directly under several of the contributing properties of the Oxford Square Craftsman District. The potentially effected residences include 1246, 1252, 1258, 1261, and 1269 Victoria Avenue. The tops of the tunnels would be an estimated 45 feet below the surface as they passed under Oxford Square. This configuration raises the potential for groundborne noise and vibration and for potential settlement impact during construction.

Proposed mitigation measures for noise and vibration impacts can be found in section 7.11 of the SEIS/SEIR. These measures would reduce the projected noise and vibration effects to insignificant levels. Under these circumstances, the project would not adversely affect the Oxford Square District with respect to noise and vibration.

Since the tunnels will be built directly under Oxford Square, the potential for significant subsidence is greatened. Mitigation measures include pre-construction surveys, use of instrumentation during construction, and chemical and compaction grouting. These measures have generally proved effective. However, there is always an element of uncertainty in a tunneling project and, consequently, a potential for settlement to occur.

7.19.6 Summary of Section 106 Findings

In summary, the No Project Alternative would not affect any National Register-eligible resources.
If Alternative A were selected, the project would not adversely affect NRHP-eligible historic properties.

If Alternative B were selected, ~~tunneling~~ cut-and-cover construction for the tunnels under the West Boulevard Overcrossing could adversely affect the bridge due to subsidence. In addition, vibration due to subway train operation could also affect the bridge's structural integrity. Although mitigation of these impacts would require careful engineering, successful implementation of such measures is ~~seem~~ feasible.

If Alternative C were selected, tunneling under the Oxford Square Craftsman District could have an adverse effect due to ground subsidence. The probability of successfully mitigating subsidence impacts by implementing preventive measures such as requiring the MTA contractor to use earth pressure balance TBMs and grouting during construction is ~~seems~~ reasonably high. Another proven solution to the subsidence problem is the use of a closed-face earth pressure balance TBM.

7.20 SECTION 4(f) EVALUATION

7.20.1 Introduction

Section 4(f) of the Department of Transportation Act of 1966 (49 USC 1653, now 49 USC 303; 23 U.S.C. 138; and 23 CFR 771.107 and 771.135) declares a national policy that special effort be made to preserve the natural beauty of the countryside, including public park and recreation lands, wildlife and waterfowl refuges, and historic sites. This section reports on studies carried out in accordance with the U.S. Department of Transportation (DOT) regulation concerning resources protected under Section 4(f).

According to Section 4(f), the Secretary of Transportation may approve a federal transportation project that requires use of publicly-owned land from a park, recreation area, wildlife or waterfowl refuge, or significant historic site only if:

(1) There is no feasible and prudent alternative to the use of such land, and:

(2) The proposal includes all possible planning to minimize harm to the Section 4(f) land resulting from such use.

A "use" under Section 4(f) occurs when protected land is permanently acquired for a transportation project, when a temporary use of protected land is considered adverse, or when there is a constructive use of protected land. A constructive use occurs when a project results in adverse effects that harm the use of the protected property. The following is a draft 4(f) analysis for each of the alternatives. A comprehensive 4(f) analysis on the effects on parkland by ~~within~~ the Locally Preferred Alternative (LPA) will be prepared when the LPA is chosen and included in the final SEIS/SEIR.

7.20.2 Section 4(f) Analyses

Properties Protected under Section 4(f)

In addition to the requirements of Section 4(f), Sections 106 and 110 of the National Historic Preservation Act, as amended, require that federal agencies take into account the effects of their projects on historic and cultural resources. In accordance with Section 4(f), Sections 106 and 110, Executive Order 11593 and the guidelines promulgated by the Advisory Council on Historic Preservation (ACHP), the FTA and the MTA have undertaken an affirmative search for historic resources that could be affected by the project.

As described in Section 7.19 above, MTA surveyed properties within an area that could potentially be affected by the project alternatives. This area is termed the Area of Potential Effects (APE). Within the APE, no historic resources are currently listed on the National Register of Historic Places; however, the APE contains one property and one district (containing nine contributors) previously determined eligible for the National Register. In addition, the APE includes 12 buildings, a bridge, and two districts which appear to be eligible for the NRHP (see Section 7.19.4).

Alternatives A and C would require the acquisition of a public pool site as described below. After the MTA Board chooses the LPA, a comprehensive 4(f) analysis and will be conducted and mitigation measures will be identified on that alternative's effects on the public pool and included in the final SEIS/SEIR.

Analysis of Alternative A

Alternative A would entail tunneling from the existing Wilshire/Western Station around a radius to Wilton Place where the alignment would generally follow Wilton Place and Arlington Avenue before curving under Pico Boulevard. An underground station would be built at the intersection of Olympic Boulevard and Arlington Avenue. The alternative would terminate at the Pico/San Vicente Underground Station.

Wildlife and Waterfowl Refuges

There are no wildlife or waterfowl refuges in the Alternative A APE.

Historic Sites

No properties eligible for, or appearing to be eligible for, the National Register of Historic Places would be potentially affected by construction of this project Alternative.

Public Park and Recreation Lands

The proposed terminus for Alternative A is the Pico/San Vicente Underground Station which would be built on the block bounded by Pico, San Vicente, Venice, and West Boulevards. This large block would contain the temporary terminus of the subway, a bus transfer facility, and a park-and-ride facility.

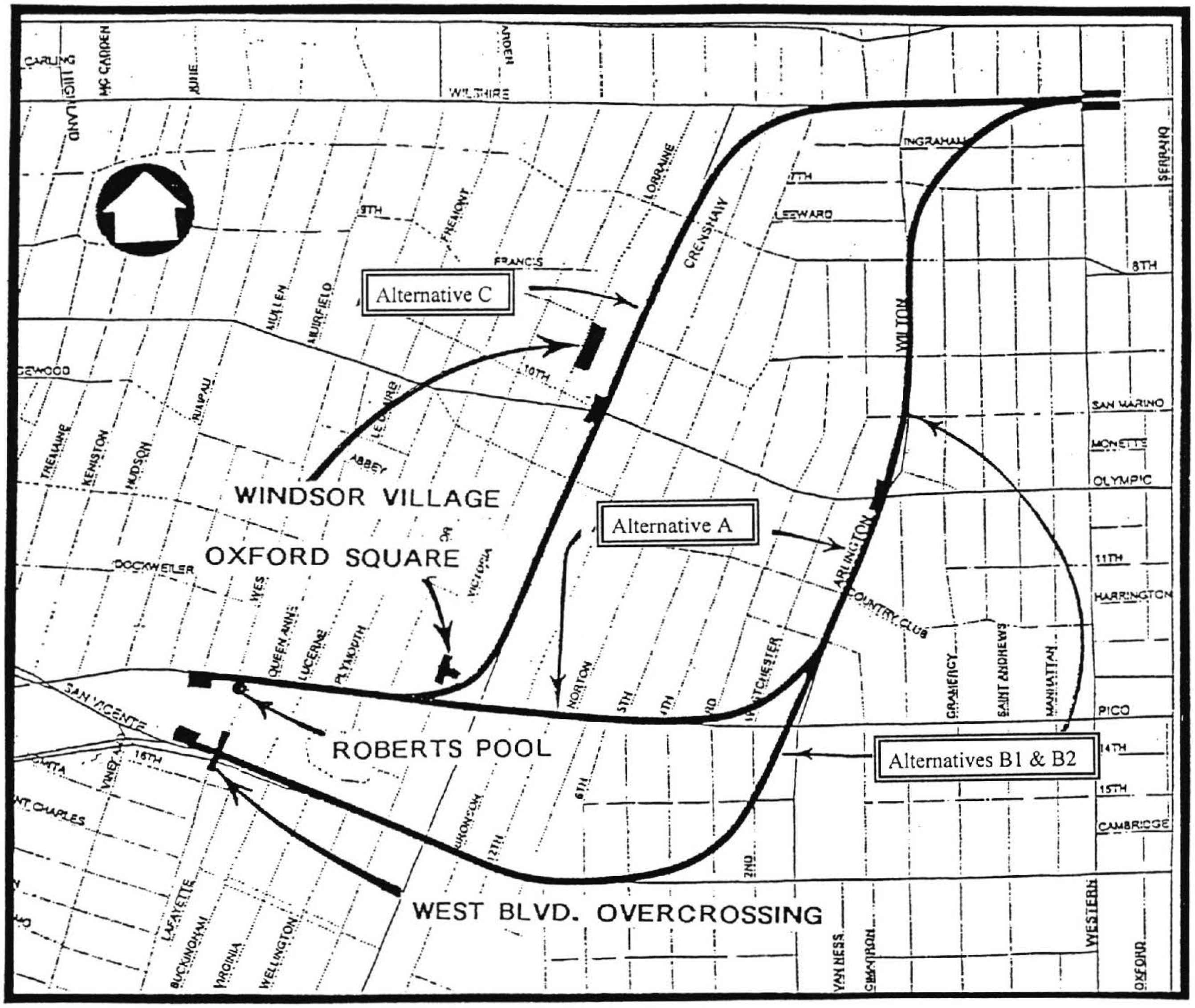
In order to reach the terminal site, the alignment must transect the site of the Eleanor Green Roberts pool, which is a municipal indoor swimming pool complex. It was constructed in 1979 and is part of the Metropolitan Region Aquatics program, of the City of Los Angeles Department of Recreation and Parks. Construction of the station would necessitate MTA acquisition of the property and demolition of the swimming pool.

The Aquatics Center is located at 4526 West Pico Boulevard, along the south side of Pico Boulevard, west of West Boulevard (Figure 7-45). The site is located in an interior lot of irregular shape with an area approximately 0.775 acre. The access to the site is from Pico Boulevard at the north side. It consists of a single-story structure housing an indoor 25 × 20 yards swimming pool and accessory use spaces, and 27 parking spaces. It was previously a police station building. The Center is used for recreational swimming, swim lessons, and team sports and is operated year round. It has a capacity of 225 bathers and 370 spectators. The pool and other building components are not accessible to disabled persons.

Measures

1. *Alternatives that Would Avoid Use*: If Alternative A is selected, there is no feasible and prudent alternative to the use of the public pool site. This is because the pool is so close to the station site that it cannot be avoided.

2. *Measures to Minimize Harm*: In order to minimize harm to recreational lands, the MTA will commit to provide for the construction of a new public pool that would replace the loss of the existing recreational facility. The new pool would be an improvement over the existing facility because it would be purpose-built (the existing facility was retrofitted from a former police station), larger, and more efficient.



ULTRASYSTEMS
ENVIRONMENTAL
INCORPORATED

FIGURE 7-45
MAP SHOWING LOCATIONS OF POSSIBLE "USE" PROPERTIES
UNDER SECTION 4(F)

3. *Coordination with Other Agencies*: MTA has consulted with the City of Los Angeles Department of Recreation and Parks regarding acquisition of the pool facility. (See Appendix D for copies of correspondence between the MTA and the City on the issue.) ~~The city has verbally agreed to the acquisition~~ ~~The~~ City staff have indicted possible support for ~~has verbally agreed to~~ the acquisition of the site as long as MTA provides for a replacement facility. Representatives of the City stated in meetings held on this issue that they would like the pool to be placed at or near the present location or within one and a half to two miles from the current site, and be in operation before the present pool is taken out of service. They also stated that they would like for the new site to be at least two acres in area and to be an indoor facility. Replacement at the current site ~~a however,~~ would ~~not~~ be challenging ~~possible,~~ since the subway configuration of both Alternatives A and C would be very close to the surface.

   MTA's Real Estate Department surveyed the general area in the vicinity of the pool. They made the following conclusions as part of their study: there are very few vacant lots in the area bounded by La Brea Avenue on the west and Crenshaw Boulevard on the east; the surrounding neighborhood is primarily residential except for the frontage on Pico Boulevard; and constructing a new pool on a site as large as two acres would require the acquisition of residential properties. If Alternative A were chosen as the LPA, a comprehensive analysis of the replacement facility and location would be completed and included in the Final SEIS/SEIR.

4. *Determination*: To be determined by USDOT.

Analysis of Alternative B

Alternative B would entail tunneling from the existing Wilshire/Western Station around a radius to Wilton Place where the alignment would generally follow Wilton Place and Arlington Avenue to Pico Boulevard. The alignment would then turn a broad radius under developed property to Venice Boulevard. An underground station would be built at the intersection of Olympic Boulevard and Arlington Avenue. It would continue under Venice, finally terminating at the Venice/San Vicente open air or aboveground (i.e. elevated) station.

Wildlife and Waterfowl Refuges

There are no wildlife or waterfowl refuges in the Alignment B area of potential effect.

Public Park and Recreation Lands

There are no public park or recreation lands in the Alignment B area of potential effect.

Historic Sites

Construction of Alignment B could potentially adversely affect the West Boulevard Overcrossing which crosses Venice Boulevard (see Table 7-67). This bridge appears to be eligible for the National Register of Historic Places on both architectural and historical grounds. The twin subway tunnels (constructed as cut-and-cover concrete box structures) would pass under the bridge at a depth of only 15 feet, thereby introducing the possibility of damage to the structure from ground subsidence and vibrations from subway operation.

The cut-and-cover technique would be used for construction. Fundamentally, this method entails excavation from the surface to the required depth, construction of the tunnels, then backfilling.

Measures

1. *Alternatives that Would Avoid Use*: Selection of either Alternative A or C would avoid impacts to the West Boulevard Overcrossing. However, if alternative Alignment B is selected, there is no feasible and prudent alternative to building the subway under the West Boulevard Overcrossing. The tunnels that would pass under the bridge cannot be deeper because the Venice/San Vicente Station site is at an elevation only slightly lower than that of the bridge. Furthermore, the alignment of Alternative B cannot be shifted horizontally because it is too close to the station site to do so.

2. *Measures to Minimize Harm*: Harm to the bridge could be minimized or even entirely avoided by implementation of appropriate engineering measures. These include aligning the tunnels configured with the Venice Boulevard right-of-way so that they avoid passing directly under the central pier and abutments of the bridge. This could greatly reduce the potential for impacts resulting from subsidence. Since the cut-and-cover method will be used to build the twin tunnels in the area adjacent to the bridge, ~~proper~~ shoring of the excavation should minimize ground subsidence.

Table 7-67
Section 4(f) Resources Affected by the Project

Location	Name/Historic Resource	Alternative Under Which 4(f) Use Would Occur	4(f) Effect
900 Victoria Avenue	Contributor to Windsor Village	Alternative C Underground	Temporary acquisition and relocation of resource for underground utility relocation work
902 Victoria Avenue	Contributor to Windsor Village	Alternative C Underground	Temporary acquisition and relocation of resource for underground utility relocation work
4526 W. Pico Blvd.	Eleanor Green Roberts Aquatic Center	Alternatives A and C Underground	Acquisition for underground tunneling
1237-1269 Victoria Avenue	Oxford Square District	Alternative C Underground	Possible affects related to potential settlement after mitigation is implemented
West Blvd. South of Pico Blvd.	West Blvd. Bridge	Alternative B Underground	Possible affects related to potential settlement after mitigation is implemented

Engineering measures will ~~might also~~ be implemented to control vibration impacts. The introduction of such features as high-resilience track fasteners and floating slab trackbed are two options ~~that have shown promise in the past~~.

3. *Coordination with Other Agencies*: A Memorandum of Agreement (MOA) was executed for the Metro Rail Project in November 1983 by the SHPO, the ACHP, the Urban Mass Transportation Administration (now the FTA) and the Southern California Rapid Transit District (now the MTA). The MOA governs the use, and protection of historic properties during Metro Rail construction. It was amended in December 1994 for the Metro Rail Eastside Extension.

4. *Determination*: To be determined by USDOT.

Analysis of Alternative C

Alternative C would entail tunneling west under Wilshire Boulevard from the existing Wilshire/Western Station to a point near Crenshaw Boulevard where the alignment would curve and continue south under Crenshaw to a point near Pico Boulevard. An underground station would be built at the intersection of Olympic and Crenshaw Boulevards. The tunnels would curve west and continue under Pico Boulevard to the Pico/San Vicente Station.

Wildlife and Waterfowl Refuges

There are no wildlife or waterfowl refuges in the Alignment C area of potential effect.

Public Park and Recreation Lands

As in Alternative A, adoption of Alternative C would entail demolition of the City of Los Angeles Eleanor Green Roberts public swimming pool. If Alternative C were chosen as the LPA, a comprehensive analysis of the replacement facility and location would be completed and included in the Final SEIS/SEIR.

Historic Sites

Selection of Alternative C would result in a Section 4(f) use of: 1) a potential constructive use of the Oxford Square Craftsman District which has already been determined eligible for listing in the National Register through a consensus determination by a federal agency and SHPO, and 2) two of the 57 contributors of the Windsor Village District, which appears eligible for listing on the National Register. The Alternative C tunnels would pass under the Oxford Square District. In addition, it would require temporary removal of two houses in the Windsor Village District in order to accommodate underground utility relocation necessitated by construction of the Olympic/ Crenshaw Station.

Measures: Oxford Square Craftsman District

1. *Description of the Oxford Square Craftsman District*: The Oxford Square Craftsman District consists of nine two-story frame residences built between 1903 and 1926 which exhibit Craftsman style architecture and which collectively represent an excellent example of a period Craftsman neighborhood. The addresses of the residences are 1237-1269 Victoria Avenue. Construction of Alignment C would entail tunneling under the district (constructive use).

2. *Measures to Minimize Harm*: Tunneling under the Oxford Square District could cause settlement impacts during construction. The top-of-tunnel depth would be approximately 50 feet. Careful monitoring and the

use of an earth pressure balance (closed face) TBM and chemical and compaction grouting where necessary would help to minimize the potential affects. Nonetheless, the potential for subsidence would still exist.

The only alternative for entirely avoiding possible subsidence of the Oxford Square Craftsman District is to route the tunnel around the district and thus avoid passing under these historic homes. However, this option is probably not desirable ~~feasible~~ due to the fact that it would entail broadening the radius connecting Pico and Crenshaw Boulevards, thereby decreasing the length of track under the public rights-of-way and increasing the length passing under private property where right-of-way would have to be purchased. This would also create impacts for other property owners.

3. *Coordination with Other Agencies*: ~~See~~Coordination with other agencies is described above in section 7.20.2 ~~above~~..

4. *Determination*: To be determined by USDOT.

Measures: Windsor Village District

1. *Description of the Windsor Village District*: The Windsor Square Village is an example of a 1910s-1920s neighborhood incorporating revival style architecture which has retained its integrity. The village stands out because of its architecture, set back, and consistent street landscaping with large palms. The district consists of 57 contributing features, two of which would be affected by construction of the Olympic/ Crenshaw Station (900 and 902 Victoria Avenue). The two buildings would be affected as a result of underground utility relocation necessitated by station construction.

   The utilities to be relocated are a 12-foot by 13-foot box storm drain and a 57-inch sanitary sewer. Because the stations will be at approximately the same elevation as the utilities, the utilities need to be relocated. Since two of the houses overlie the utilities, they would be temporarily moved from their lots and replaced after construction is complete.

2. *Avoidance Alternatives*: The use of jacking or micro-tunneling techniques was explored as an alternative method of relocating these utilities in order to avoid temporary relocation of the two buildings. However, due to the size of the utility lines and their shallow depth, this method was determined not to be feasible at this location.

   As an alternative to temporarily relocating the historic buildings during cut-and-cover construction, the buildings could be raised from their foundations to allow crawl-space access beneath them. Utility relocation would proceed below the buildings. With utility relocation complete, the buildings would be lowered onto their foundations. This alternative avoids relocation of the two homes but still results in disturbance to these historic resources. However, this measure only applies to Alternative C since there are no proposed cut-and-cover method relocations of major utilities that pass under any buildings within Alternatives A and B.

   Several other alternatives for the utility relocations have been considered. A study by the City of Los Angeles Collection Systems Engineering Division (*Sewer Relocation Study*, March 1994) examined several alternatives and concluded only one alternative meets the needs and requirements of the City while resolving conflicts with the rail project. This alternative would reroute the utilities along Bronson Avenue. The City ascertained that this was the only alternative that employed an all gravity system to reroute flows around the project.

~~The City ascertained that this was the only alternative that employed an all gravity system to reroute flows around the project. Problems with this alternative include the potential for encountering levels of high groundwater; that the alternative is deep and would require tunneling construction methods; and that the depth of the selected alternative would make routine maintenance difficult. Moreover, the necessary tunneling construction may require relocation and/or disruption to additional properties along the route.~~

3. *Measures to Minimize Harm*: The two houses would be temporarily moved off their locations during construction and returned to their original setting after construction is complete. The MTA, acting on behalf of the FTA, would ensure that each property is moved according to approaches recommended in *Moving Historic Buildings* (John Obed Curtis, 1979, American Association for State and Local History), in consultation with the State Historic Preservation Officer (SHPO) and by a professional mover who has the capacity to move historic structures without damage. The MTA would ensure that both 900 and 902 Victoria Avenue would be properly secured and protected from vandalism and weather damage during the period each is unoccupied. The houses would be returned to their original location and orientation after construction.

   Adequate restrictions or conditions to ensure preservation of the properties' significant historic feature will be included if necessary in stipulations to the Memorandum of Agreement for this project for the two contributors to the Windsor Village District which are to be acquired but not altered. For this reason the effects on the Windsor Village District would be an Exception to the Criteria of Adverse Effect according to the conditions set forth in 36 CFR 800.9(c)(3). Provided these restrictions and stipulations are adopted as mitigation, the project would have no adverse effect upon the District.

4. *Coordination with Other Agencies*: ~~See~~Coordination with other agencies is described above in section 7.20.2~~ above~~. Article IV of the National Historic Preservation Act, as amended, covers the temporary relocation of historic structures and would be applicable here.

5. *Determination*: To be determined by USDOT.

7.20.3 Archaeological Resources

No significant archaeological resources have been identified within the Area of Potential Effect. Consequently, no adverse effects on archaeological resources are anticipated as a result of subway construction, no matter which alignment alternative is selected. But because archaeological resources in urban areas are usually buried or paved over, there is often no practical means for detecting their presence prior to unearthing during a construction project.

The literature search conducted for this study suggests the possibility that historic~~ or prehistoric~~ archaeological resources are located at or around the site of the former Pacific Electric Railway Power House which corresponds to the proposed location of the Venice/San Vicente Station (Alternative B). If such resources were uncovered, they might qualify as historic sites pursuant to Section 4(f).

In order to mitigate potentially significant impacts on archaeological resources, construction of the Venice/San Vicente Station will be monitored by a professional archaeologist. Protection of archaeological resources in all other construction areas should be accomplished by the procedures outlined in *Treatment Plan for Potential Cultural Resources Within Proposed Metro Rail Subway Station Locations in Metropolitan Los Angeles, California* (SCRTD, 1985). MTA has a standard construction monitoring plan for archaeological resources that will be followed during excavation. If archaeological resources are found, work in that area would be halted immediately pending evaluation of the discovery. MTA's plan details the appropriate range of actions to be taken. The SHPO would assist with development of a mitigation plan if one were required.

7.21 ENERGY

7.21.1 Environmental Setting

Electricity for the 464-square-mile City of Los Angeles area is primarily supplied by the City of Los Angeles Department of Water and Power (LADWP). During fiscal year 1993-94, approximately 21.2 billion kilowatt-hours (kWh)[1] of electricity were produced or purchased to satisfy customer demand in LADWP's service area.[2] Power for this service area is provided by facilities throughout the western United States. Power sources include coal (45 percent), oil and natural gas (20 percent), purchases from the western states power grid (14 percent), hydroelectric (12 percent), and nuclear (9 percent).

To maintain a continued supply of reliable and economic electricity, LADWP is participating in a number of energy development projects both alone and in cooperation with other public agencies. In addition to the gas, coal, and nuclear projects now underway, generation sources under consideration include landfill gases, small hydroelectric, geothermal, solar, cogeneration, and other alternative energy sources. By Year 2000, LADWP expects its peak demand to be about 5,475 megawatt-hours, and its total energy use to be approximately 23.3 billion kWh. LADWP projects that nearly half of its power supply will be produced by coal (49 percent), with gas and oil (12 percent); nuclear (eight percent); hydroelectic (eight percent); geothermal, solar, and cogeneration (six percent); and purchases (11 percent) comprising the remainder.

7.21.2 Project Impacts

Thresholds of Significance Criteria

State CEQA Guidelines, Appendix G indicates that the following impacts would normally be considered significant:

- using fuel or energy in a wasteful manner; and
- using large amounts of fuel or energy.

The use of technologies that consume substantially more energy than readily available comparable technologies would be considered to be wasteful, absent some compelling reason for use of a particular technology (e.g., use of electrical construction equipment to reduce air pollution). Failure to institute energy conservation measures now in general use in the region (e.g., waste recycling, building energy management systems) could also be considered wasteful.

The determination of what constitutes a "large" amount of energy is subjective. However, a change that would:

- Result in local shortages of fuels or energy;
- Increase peak electrical demand in LADWP's service area by more than one percent;
- Require substantial upgrades of the existing electrical distribution system; or
- Would be considered a large amount.

1/ Ted Mureau, Energy Services, Los Angeles Department of Water and Power; telephone conversation, October 10, 1995. 23.3 billion kWh equals 7.9×10^{13} Btu.

2/ Los Angeles Department of Water and Power, *Annual Report*, 1994. One kWh equals 3409.5 British thermal units (Btu). Therefore 21.2 billion kWh equals 7.2×10^{13} Btu.

Energy consumption for the project includes both the one-time expenditures of energy for project construction and the continuing commitment of energy for system operations and maintenance. Energy consumption can be addressed in terms of the following project elements:

- Rail vehicles manufactured during construction;
- Guideway and station construction;
- Vehicle propulsion;
- Station operations (including lighting, heating, and ventilation);
- Vehicle maintenance; and
- Changes in vehicle miles traveled and trip generation.

7.21.2.1 Construction

Rail vehicle (not produced in the United States) manufacturing for the Metro Rail system has been estimated (1987 Draft SEIS/SEIR) at 14 billion British Thermal Units (Btu) per year, or about 1,709 Btu per vehicle-mile traveled. Guideway construction energy was estimated on a "per mile" basis, using a factor of 385 Btu per mile for underground construction; this energy commitment is also expressed as about 22,700 Btu per vehicle-mile traveled. The use of this amount of energy for one-time construction activities would not be considered a significant impact.

No Project Alternative

No significant impacts would occur under the No Project Alternative.

Alternative A (Wilton/Arlington/Pico)

Based on a tunnel/track distance of 2.4 miles for Alternative A, and using a factor of 385 billion Btu per mile for underground construction, the estimated energy that would be consumed for the construction is about 924 billion Btu. This increase would not result in a substantial loss of fuels or energy, would not increase peak electrical demand by more than 1 percent, would not require substantial upgrades of the existing electrical distribution systems, and would not result in a large increase in electrical consumption over existing levels. This would not be considered a wasteful or inefficient use of electricity for one-time construction activities, and therefore would not result in a significant impact.

Alternatives B1 and B2 (Wilton/Arlington/Venice)

Based on a tunnel/track distance of 2.6 miles for Alternative B1, and using a factor of 385 billion Btu per mile for underground construction, the estimated energy that would be consumed for the construction is about 1,001 billion Btu. This increase would not result in a substantial loss of fuels or energy, would not increase peak electrical demand by more than 1 percent, would not require substantial upgrades of the existing electrical distribution systems, and would not result in a large increase in electrical consumption over existing levels. This would not be considered a wasteful or inefficient use of electricity for one-time construction activities, and therefore would not result in a significant impact.

Alternative C (Crenshaw/Pico)

Based on a tunnel/track distance of 2.3 miles for Alternative C, and using a factor of 385 billion Btu per mile for underground construction, the estimated energy that would be consumed for the construction is about 886 billion Btu. This increase would not result in a substantial loss of fuels or energy, would not increase peak electrical demand by more than 1 percent, would not require substantial upgrades of the existing electrical distribution systems, and would not result in a large increase in electrical consumption over existing levels. This would not be considered a wasteful or inefficient use of electricity for one-time construction activities, and therefore would not result in a significant impact.

7.21.2.2 Operation and Maintenance

Rail vehicle propulsion and maintenance for the Metro Rail system has been estimated (1987 Draft SEIS/SEIR) at 65,224 Btu per vehicle-mile and at 9,684 Btu per vehicle-mile, respectively. Station operations have been estimated at about 48,419 Btu per vehicle-mile. The use of this amount of energy would not be considered a large amount in comparison to the quantity of energy available from existing power sources, and therefore would not result in a significant impact.

Energy consumption would also result from electricity used for station operations (e.g., lighting and heating) and fossil fuel consumption from vehicles driving to the station. The amount of electricity used for station operations would not exceed overall projections for the region nor require substantial upgrades of existing facilities and therefore would not be significant. Although fossil fuel would be consumed by vehicles driving to the station, projections indicate that the proposed project would reduce overall traffic within the Mid-City corridors by 5% (see 7.2 Traffic). In addition, vehicle miles traveled by private automobile would be reduced which would result in a corresponding reduction of fossil fuel consumption. The proposed project would implement energy conservation measures referenced in the Regional Comprehensive Plan and Guide by promoting public transit and reducing vehicle miles traveled (a primary consumer of fossil fuels).[3]

No Project Alternative

Under this alternative, many residents and workers in the region would continue to travel by bus or by private automobile, rather than by rail. ~~In general, the energy consumption of bus transportation is substantially less than that of rail travel, while private automobile travel is comparable to or slightly higher -- depending upon assumptions such as number of occupants -- than rail transportation in its energy efficiency (Transportation Research Board, 1984, *Transportation Research Record 988: Methodologies for Considering Technical Energy Issues in Urban Transportation Planning*).~~

Without implementation of the proposed project fossil fuel consumption and vehicle miles traveled by private automobile would continue to increase as the population increases and regional public transportation goals would not be realized.

Alternative A (Wilton/Arlington/Pico)

Based on a tunnel/track distance of 2.4 miles for Alternative A, and approximately 50,000 trips per year, the estimated energy that would be consumed during operation and maintenance is about 14.8 billion Btu per year. This increase would not result in a substantial loss of fuels or energy, would not increase peak electrical demand by more than 1 percent, would not require substantial upgrades of the existing electrical distribution systems, and would not result in a large increase in electrical consumption over existing levels. This would not be considered a wasteful or inefficient use of electricity, and therefore would not result in a significant impact.

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[3] Southern California Association of Governments, *Regional Comprehensive Plan and* Guide, Chapter 12, March 1996.

Alternatives B1 and B2 (Wilton/Arlington/Venice)

Based on a tunnel/track distance of 2.6 miles for Alternative B1, and approximately 50,000 trips per year, the estimated energy that would be consumed during operation and maintenance is about 16.0 billion Btu per year. This increase would not result in a substantial loss of fuels or energy, would not increase peak electrical demand by more than 1 percent, would not require substantial upgrades of the existing electrical distribution systems, and would not result in a large increase in electrical consumption over existing levels. This would not be considered a wasteful or inefficient use of electricity, and therefore would not result in a significant impact.

Alternative C (Crenshaw/Pico)

Based on a tunnel/track distance of 2.3 miles for Alternative C, and approximately 50,000 trips per year, the estimated energy that would be consumed during operation and maintenance is about 14.2 billion Btu per year. This increase would not result in a substantial loss of fuels or energy, would not increase peak electrical demand by more than 1 percent, would not require substantial upgrades of the existing electrical distribution systems, and would not result in a large increase in electrical consumption over existing levels. This would not be considered a wasteful or inefficient use of electricity, and therefore would not result in a significant impact.

Additional electrical consumption would also occur from fans associated with the air flow system which moves air through the tunnel and the two ventilation shafts used to prevent the build up of hydrogen sulfide gases. The amount of energy used for these uses would also not result in a significant impact since electrical supply is readily available.

7.21.3 Cumulative Impacts

7.21.3.1 Construction

No Project Alternative

Implementation of the No Project Alternative would not result in significant impacts.

Alternative A (Wilton/Arlington/Pico)

Cumulative energy impacts consist of the energy consumption requirements of the proposed transit project, plus the energy requirements resulting development of the related project's listed in Section 6.0 of this document. Energy conservation measures to be implemented for the proposed project would apply to future MTA facilities and the related projects, and would conserve energy throughout the MTA's regional transit network. In addition, LADWP maintains sufficient capacity to meet foreseeable cumulative energy demands in their service area of the Los Angeles region. Thus, regional cumulative energy impacts would be insignificant.

Alternatives B1 and B2 (Wilton/Arlington/Venice)

The cumulative effects of this alternative are the same as described above for Alternative A.

Alternative C (Crenshaw/Pico)

The cumulative effects of this alternative are the same as described above for Alternative A.

7.21.3.2 Operation and Maintenance

No Project Alternative

Implementation of the No Project Alternative would not result in significant cumulative energy impacts.

Alternative A (Wilton/Arlington/Pico)

Cumulative energy impacts consist of the energy consumption requirements of the proposed transit project, plus the energy requirements resulting development of the related project's listed in Section 6.0 of this document. Energy conservation measures to be implemented for the proposed project would apply to future MTA facilities and the related projects, and would conserve energy throughout the MTA's regional transit network. In addition, LADWP maintains sufficient capacity to meet foreseeable cumulative energy demands in their service area of the Los Angeles region. Thus, regional cumulative energy impacts would be insignificant.

Alternatives B1 and B2 (Wilton/Arlington/Venice)

The cumulative effects of this alternative are the same as described above for Alternative A.

Alternative C (Crenshaw/Pico)

The cumulative effects of this alternative are the same as described above for Alternative A.

7.21.4 Mitigation Measures

Propulsion Energy Conservation

~~Previous Metro Rail environmental documents have identified~~ The following measures are designed to mitigate operational energy consumption:

1. Significant kinetic energy is created when a rail train accelerates and decelerates. This energy is typically wasted. An energy conservation measure Metro Rail will use is an alternating-current (AC) propulsion subsystem option, which is more efficient than a direct current (DC) "chopper" subsystem.

2. A special aluminum-clad steel third rail—a much more effective conductor than the conventional steel rail—will be used.

3. Rail vehicles will be designed and operated so that they are switched off whenever they are not in service.

~~4. The traction system will be designed so that it can eventually be integrated with any adjacent future electrical systems, such as trolley buses and light rail systems, facilitating more-efficient use of Metro Rail regenerative braking energy.~~

Station and Facilities Design

4. During final design, every aspect of station design will be reviewed in order to minimize lighting, heating, ventilation, and air conditioning energy requirements, as follows:

- Temperature control requirements will be minimized by using the warm air exchange provided by the piston effect of the trains.

- Passenger areas within stations will be designed so that the lights can be turned off during off-service hours.

- In the maintenance yard, cold water will be used for vehicle washing.

- The track layout will be designed to minimize non-revenue vehicle movements.

- Appropriate Metro Rail facilities will have separate electric meters to facilitate energy consumption monitoring and conservation.

7.21.5 Unavoidable Significant Adverse Impacts

No adverse impacts to energy issues are anticipated after the implementation of mitigation measures.

7.22 ELECTRIC AND MAGNETIC FIELDS

7.22.1 Environmental Setting

Electric and magnetic fields (EMF) are created whenever electricity is generated, used, or transported. EMF is relevant to this project because electricity would be used to power the trains. Electric current in a conductor consists of electric charges which produce two kinds of fields in the immediate area surrounding the electric conductor. The electric field component of EMF is measured in microvolts per meter (μV/m), a unit of electromotive force. The primary issue associated with electric fields is interference with radio and television communications. The magnetic field component is measured in MilliGauss (mG), a unit of magnetic induction. The primary issue related to magnetic fields is the potential for human health effects. Questions have been raised as to whether exposure to magnetic fields in the extremely-low-frequency range could adversely affect human health in the form of leukemia or cancer. Extensive research has been conducted into the potential effects of EMF exposure. To date, no reliable association between EMF exposure and such health effects has been established.

Existing EMF Levels

The frequency of EMF, measured in Hertz (the number of cycles per second of alternating current), is important in determining the environmental and health effects of EMF. Most people are continuously exposed to background sources of EMF at levels of about 0.4-40 mG generated predominantly by alternating current of 50-60 Hertz (Hz). Background sources commonly include utility power lines, wiring in buildings, and home appliances. Frequencies between 3 and 3,000 Hz are considered very low and generate extremely-low-frequency EMF.

Sensitive Receptors

Sensitive receptors to EMF include Metro Rail construction workers, Metro Rail employees, Metro Rail patrons, , and EMF-sensitive local businesses and activities (such as communications).

EMF Regulations and Policies

The procedures used in this analysis to assess the potential EMF impacts of the project conform with the general requirements provided in *Final Procedures for Considering Environmental Impacts* (U.S. Department of Transportation/Federal Railroad Administration 1980). No federal standard exists for either environmental or occupational exposures to electric and magnetic fields, nor have enforceable California or local regulations been identified that would cover EMF associated with the project. Various professional and scientific organizations, such as the American Conference of Government and Industrial Hygienists (ACGIH), the Food and Drug Administration (FDA), and the International Non-Ionizing Radiation Committee of the International Radiation Protection Association (IRPA) have proposed voluntary exposure limits.

7.22.2 Project Impacts

Thresholds of Significance Criteria

Interference with radio and television communications associated with electric fields is regulated by the Federal Communications Commission (FCC). The FCC has developed the following limitations (at a distance of three meters from a given facility) to minimize interference:

Frequency Range of Facility (Hz)	Allowable Electric Field Generated (μV/m)
30 - 88	100
88 - 216	150
216 - 960	200
+960	500

These regulations are considered significance thresholds for interference effects associated with electric fields from project facilities.

As discussed above, no federal, State, or local significance threshold has been established for human exposure to magnetic fields. Thus, the IRPA's voluntary exposure limits are being used for purposes of this analysis as a reference point against which project exposures can be assessed. These exposure limits are as follows:

Exposure	Field Intensity (mG)
24-hour community	1,000
8-hour occupational	5,000
Short-term occupational	50,000

Construction and Operation

No Project Alternative

No significant impacts would occur under the No Project Alternative.

Alternative A (Wilton/Arlington/Pico)

For the Metro Red Line Mid-City Segment, human exposure to EMF during the construction phase (e.g., from additional distribution lines to the site or from power generators) would be limited to Metro Rail construction workers and visitors to the project site. The community at large would be exposed to project-related EMF only where new distribution lines, transmission lines, and substations were needed to serve the system and increased regional electrical demand. However, the magnetic field directly under a typical overhead 12-kilovolt distribution line ranges from .01 mG to 30 mG and directly under a typical double circuit 220-kilovolt transmission line would be 40 mG. These levels decreases dramatically as distance from these sources increase. Even the maximum levels are well below the stated exposure levels previously stated. The location of on-site electrical facilities have not yet been identified in the project's engineering design. No significant impacts to project construction workers or others as a result of EMF exposure are anticipated.

Human exposure to EMF during the operation and maintenance phase of the project would be limited to guideways and stations which would be underground. Different types of EMF receptors have differing sensitivities to EMF and differing exposure intensities and durations. Individual differences in EMF sensitivity may exist among adults and children.

EMF exposure levels on the Metro Rail system are not known. Table 7-68 presents typical exposure levels, based on an EPA study of a proposed rail system for the northeastern United States.

The typical EMF exposures presented in Table 7-68 are well below the IRPA's voluntary exposure limits and therefore would ~~are~~ not ~~expected to~~ result in a significant adverse effect on human health.

The project's electric fields on nearby sensitive equipment and communications would remain below the FCC's threshold of 100 μV/m, and would be less than significant.

Alternatives B1 and B2 (Wilton/Arlington/Venice)

Impacts as a result of EMF exposure would be the same as Alternative A. EMF exposure would not significantly increase even with the implementation of the Venice/San Vicente (Higher Elevation) Station (Alternative B2).

Alternative C (Crenshaw/Pico)

Impacts as a result of EMF exposure to project construction workers would be the same as Alternative A.

7.22.3 Cumulative Impacts

No Project Alternative

No significant impacts would occur under the No Project Alternative.

Alternative A (Wilton/Arlington/Pico)

The construction of related projects, in conjunction with proposed project development, would not include any additional facilities known to produce levels of EMF above the FCC or IRPA limits. Thus, cumulative EMF impacts would be less than significant.

Alternatives B1 and B2 (Wilton/Arlington/Venice)

Impacts as a result of EMF, in conjunction with related project development, would be the same as Alternative A.

Alternative C (Crenshaw/Pico)

Impacts as a result of EMF, in conjunction with related project development, would be the same as Alternative A.

7.22.4 Mitigation Measures

No significant impacts are anticipated; therefore, no mitigation measures are required.

7.22.5 Unavoidable Significant Adverse Impacts

No unavoidable significant adverse impacts are anticipated.

Table 7-68
Typical EMF Exposures

Location	Distance (ft.)	Exposure (mG)
locomotive	--	22 - 134
coach	--	3 - 26
station	--	16 - 209
guideway	10-30	4 - 37
	20-50	1.5 - 9
	50-100	0.4 - 1.5
	100-150	0.2 - 0.4
stations	10-30	2 - 14
	20-50	1 - 2
	50-100	0.2 - 0.5
	100-150	N/A

Source: Federal Railroad Administration, U.S. Department of Transportation, Draft Environmental Impact Statement/Environmental Impact Report, Volume III: Technical Studies, Northeast Corridor Improvement Project Electrification - New Haven, CT to Boston, MA, Final Report, September 1993. Envirorail, 1995.

8.0 ECONOMIC AND FISCAL IMPACTS

8.1 Economic Impacts

8.1.1 Economic Setting

Los Angeles is a region with a strong and diverse economic base, relying for its prosperity on traditional manufacturing activities and on a wide range of entertainment and service industries, retail trade, and real estate. According to the California Employment Development Department (EDD), Los Angeles County has about 4.1 million jobs in 1997, and a projected 4.9 million jobs by 1999.[1] The Southern California Association of Governments (SCAG) 1994 Forecast projects Los Angeles County to have 5.7 million jobs of 2010. According to the EDD, the City of Los Angeles has about 1.6 million jobs in 1997. SCAG project the city to have 2.2 million jobs in 2010.[2]

The recession that began in 1990 is still affecting Los Angeles County, even though a recovery in the U.S. economy has been under way for more than three years. According to the EDD, as of March, 1997 the unemployment rates in Los Angeles County and the City of Los Angeles stand at about 7.1 percent, and 8.0 percent respectively. This is substantially higher than the 5.5 percent nationwide unemployment rate.

8.1.2 Economic Impacts

8.1.2.1 During Construction

Construction of the Mid-City Segment would result in the following temporary benefits to the local and regional economies: (1) direct economic benefits through new construction jobs and (2) indirect economic benefits through increased expenditures in other sectors of the economy. Direct and indirect employment would have economic benefits for the local and regional economies, although some of the employment could be generated outside the region. As a result of construction, direct employment would occur in industries whose jobs and services are purchased to build the project. Indirect economic benefits are created by the secondary demand for goods and services across a broader spectrum of industrial sectors as a result of the economic multiplier effect of construction. Direct and indirect effects of project expenditures during construction are estimated below.

Construction activity could, however, result in temporary and permanent adverse impacts as well. For example, under Alternatives A and C, impeded vehicular and pedestrian access could reduce revenues for local retail businesses located adjacent to cut-and-cover construction sites. All of the "build" alternatives would require the acquisition of buildings, some of which house businesses. As shown in Table 8-1 and 8-2, Alternative A building acquisitions would affect 22 businesses and displace 233 employees. Alternative B building acquisitions would affect 20 businesses and displace

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[1]/ California Employment Development Department 400 C Report, April 18, 1997

[2]/ Southern California Association of Governments, Regional Comprehensive Plan & Guide, January 1995.

Table 8-1
Construction Cost Estimates (Millions of 2008 Dollars) and Estimated Construction Employment

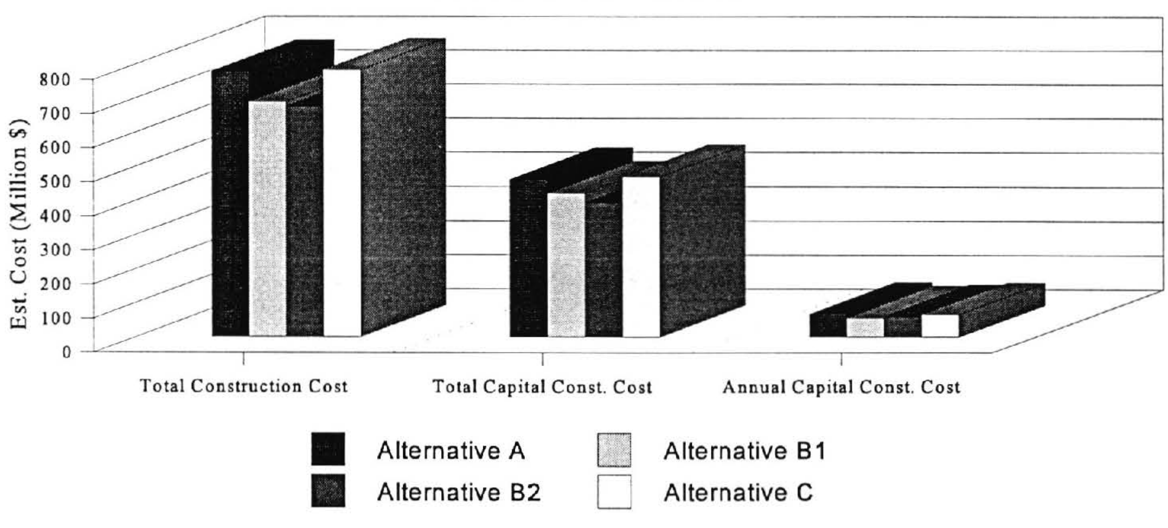
Alternative	Total Construction Cost (Million $)	Total Capital Construction Cost[a] (Million $)	Annual Capital Construction Cost (Million $)	Est. Annual # Direct FTE Construction Jobs	Est. Annual # Indirect FTE Construction Jobs	Est. Annual # Total FTE Construction Jobs
A	$778	$461	$66	2,226	3,038	5,264
B1	$688	$420	$60	2,028	2,768	4,796
B2	$674	$393	$56	1,898	2,590	4,487
C	$782	$468	$67	2,260	3,084	5,344

a. Represents costs required for capital construction (guideways and structures, stations, waste hauling, water treatment, main yards and shops, system-wide equipment, pre-revenue operation, owner's insurance, master agreements, and a ten percent contingency fee). Cost figure does not include the costs of art-for-transit, right-of-way, and professional services which total construction costs include.

Source: Lee Andrews Group, Inc., 1997.

Table 8-2

Construction Cost Estimates



185 employees. Alternative C building acquisitions would affect 25 businesses and displace 300 employees. If the affected businesses are unable to relocate or choose not to relocate within the Mid-City area, then the displaced employees could be adversely impacted. (See Section 7.6 for a discussion of business displacement impacts.)

Direct And Indirect Employment Benefits During Construction

The number of jobs which would be produced by construction activity is derived applying estimates of capital construction costs to employment multipliers provided by the America Public Transit Association (APTA).[3] Based on the APTA study: *Employment Impacts of Transit Capital Investment and Operating Expenditures*(April 1, 1983), each $100 million invested in new rail projects is estimated to directly increase national employment by 3,380 direct full-time equivalent (FTE) jobs and by 4,613 indirect FTE jobs for a total of 8,000 FTE jobs.

Total construction costs for Alternative A over the seven year construction period are estimated to be $778 million, $688 million for Alternative B1, $674 million for Alternative B2, and $782 million for Alternative C. Of these total construction costs, capital construction costs are estimated to be $461 million for Alternative A, $420 million for Alternative B1, $393 million for Alternative B2, and $468 million for Alternative C. Using the APTA multipliers, Alternative A would generate approximately 2,226 direct FTE jobs and 3,038 indirect FTE jobs for a total of 5,264 FTE jobs annually. Alternative B1 would generate approximately 2,028 direct FTE jobs and 2,768 indirect FTE jobs for a total of 4,796 FTE jobs annually. Alternative B2 would generate approximately 1,898 direct FTE jobs and 2,590 indirect FTE jobs for a total of 4,487 FTE jobs annually. Alternative C would generate approximately 2,260 direct FTE jobs and 3,084 indirect FTE jobs for a total of 5,344 FTE jobs annually. (See table 8-1 and 8-2)

The No-Project Alternative would not generate the above levels of employment for the local and regional economy.

Indirect Economic Benefits During Construction

The Mid-City Segment would produce indirect economic benefits to the area and regional economies as a result of construction spending. The 1991 SCAG Input Output Model applies a 1.74 regional multiplier to determine indirect economic benefits of construction spending. The 1.74 multiplier indicates that for each dollar invested in new rail construction, another 74 cents would be generated within the region in the form of additional income, employment, and economic output. Using this formula, Alternative A would generate an additional $341 million, Alternative B1 would generate an additional $311 million, Alternative B2 would generate an additional $291 million, and Alternative C would generate an additional $346 million. Table 8-3 shows the estimated indirect economic benefits associated with the construction expenditures for the Mid-City Segment. These indirect benefits are expressed in total 2008 dollars for the seven-year construction period.

3/ Capital construction costs are the expenditures required for capital construction (guideways and structures, stations, waste handling water treatment, main yards and shops, system-wide equipment, pre-revenue operation, owner's insurance, master agreements, and a ten percent contingency fee). They do not include other elements included in total construction costs such as art-for-transit, right-of-way, and professional services.

Table 8-3
Economic Benefits of Construction

Alternative	Total Capital Construction Cost[a] (Millions $)	Total Indirect Economic Benefit[b] (Millions $)	Annual Indirect Economic Benefit[c] (Millions $)
A	$461	$341	$49
B1	$420	$311	$44
B2	$393	$291	$42
C	$468	$346	$49

a. Represents costs required for capital construction (guideways and structures, stations, waste hauling, water treatment, main yards and shops, system-wide equipment, pre-revenue operation, owner's insurance, master agreements, and a ten percent contingency fee). Cost figure does not include the costs of art-for-transit, right-of-way, and professional services which total construction costs include.
b. Based on SCAG multiplier of 1.74.
c. Annual calculations are based on a seven (7) year project.
Source: Lee Andrews Group, Inc., 1997.

8.1.2.2 Operation And Maintenance

Operation and maintenance of the Mid-City Segment could directly benefit the local and regional economies by creating employment opportunities to operate and maintain the segment. According to the MTA, Operation and Maintenance ("O & M") expenses for all three alternatives would amount to $5 million per year and would create 20 new jobs within MTA. In addition, new permanent jobs could be created by new commercial development at and around the station sites. However, these must be weighed against the number of jobs lost by businesses displaced by the project who close down or are not relocated. (See Section 7.6 Property Acquisition and Displacement.)

8.1.3 Cumulative Economic Impacts

The Mid-City Segment could benefit the local and regional economy via direct and indirect economic gains. These direct and indirect gains could translate into additional personal income and commercial activity in other sectors of the area and regional economy and could add to gains realized as a result of other development in the area.

8.1.4 Mitigation Measures

Each of the "build" alternatives would generate economic benefits that do not require mitigation. Mitigation measures that address acquisition and displacement affects is provided in Section 7.6 (Property Acquisition and Displacement). See Section 7.7 (Business Disruption During Construction) for a discussion of mitigation measures for businesses adversely affected by construction-related activity.

8.1.5 Unavoidable Significant Adverse Economic Impacts

Unavoidable significant adverse economic impacts would not occur as a result of the proposed project.

8.2 Fiscal Impacts

The purpose of this section is to examine the impacts the project may have upon local government revenues during construction and operation of the system.

8.2.1 Fiscal Setting

Total tax receipts for the City and County of Los Angeles in Fiscal Year 1995–96 are shown in Table 8-3.1.~~were $1.8 billion, of which property taxes accounted for an estimated $564 million; licenses, permits, fees, and fines accounted for an estimated $94 million; and business license fees accounted for an estimated $283 million. Sales tax revenue for the City of Los Angeles for Fiscal Year 1995–96 was $371 million. Los Angeles County receipts for the same period were $9.2 billion, with property taxes accounting for $1.6 billion and licenses, permits, and franchise fees accounting for $48 million.~~

Table 8-3.1
Total Tax Receipts for the City and County of Los Angeles in Fiscal Year 1995–96

Source	City	County
Property Taxes	$564,000,000.00	$1,630,000,000.00
Licenses, Permits, Fees, and Fines	$94,000,000.00	$179,000,000.00
Business License Fees	$283,000,000.00	$0.00
Sales Tax	$371,000,000.00	$0.00
Total	$1,312,000,000.00	$1,809,000,000.00

a. City of Los Angeles, Controller's Comprehensive Annual Financial Report, Fiscal Year Ended June 30, 1996. Rick Tuttle, Controller.

b. County of Los Angeles, California, Comprehensive Annual Financial Report, Fiscal Year Ended June 30, 1996. Alan T. Sasaki, Auditor/Controller.

8.2.2 Fiscal Impacts

Property acquisitions for the Underground Stations Alternative and the Aboveground Stations Alternative may adversely affect property tax and sales tax revenues received by local governments.

The Underground Stations Alternative and the Aboveground Stations Alternative would require the acquisition of some buildings which house businesses. If these businesses are unable to relocate in the local jurisdiction, then the level of sales taxes received by local governments may be adversely affected. These effects are discussed below.

Property Tax

Property taxes are levied on assessed value of all privately owned property and are collected by the County of Los Angeles. Generally, the amount levied is one percent of the assessed value of the property. The amount received by the City of Los Angeles is 15 percent of the taxes collected by the County on properties located within the City of Los Angeles.

Reductions in tax revenues would not be anticipated for the No-Project Alternative. Acquisition of properties for the Mid-City segment would reduce the tax bases of the County and the City of Los Angeles.

Property taxes collected in Fiscal Year 1994-1995 for properties that would be acquired for Alternative C have been calculated using the 1995 Los Angeles County Assessor rolls (DAMAR/TRW-Redi Corporation database) and are shown in Table 8-4. The property taxes shown in the table may also include special assessment taxes.

The estimated annual property tax loss due to the construction of the Mid-City Segment would total about \$151,000 for Alternatives A, \$147,000 and Alternative B, and \$210,000 for Alternative C (see Table 8-1). According to the Office of the Los Angeles County assessor, 45 percent of those losses would be borne by the Los Angeles Unified School District. Twenty-three percent and 15 percent of the loss would be borne by the County of Los Angeles and the City of Los Angeles, respectively. The remaining 17 percent of the loss would be divided between the Community Redevelopment Agency (10 percent) and numerous special districts (7 percent).

Table 8-4
Estimated Annual Property Tax Loss to Local Government

Local Government	Tax Distribution	Tax Losses		
		Alternative A	Alternative B	Alternative C
L.A. County	23%	\$34,807	\$33,777	\$48,300
L.A. City	15%	\$22,700	\$22,028	\$31,500
Special Districts	7%	\$10,593	\$10,280	\$14,700
L.A. Unified School District	45%	\$68,100	\$66,085	\$94,400
Community Redevelopment	10%	\$15,133	\$14,685	\$21,000
Total	100%	\$151,333	\$146,855	\$209,900

Nevertheless, the anticipated annual property tax loss to local governments and local agencies under either project alternative would be negligible compared to their total property tax revenues and, therefore, would be insignificant. Also, this property tax reduction would be temporary if MTA sells the land it does not permanently need to private entities, or enters into joint development agreements for the land it does retain, particularly at the Pico/ or Venice San Vicente Station site.

Sales Tax

Sales taxes are collected by the State of California at 7.25 percent of the total sales receipts. Of this amount, 6.0 percent is allocated to the State of California, 1.0 percent is redistributed to the city and 0.25 percent to the county in which the business is located. In Los Angeles County, an additional 1.0 percent is levied as a result of

Propositions A and C,[4] yielding a Los Angeles County sales tax of 8.25 percent. According to the State Board of Equalization, Los Angeles County had almost $79 billion in total taxable sales in 1995.

Reductions in sales tax could not be anticipated for the No-Build Alternative. As a result of Alternative C (the worst case of the three build alternatives), the City of Los Angeles could lose up to 69 businesses if displaced business owners decided to close or to relocate outside the boundaries of the city. If a business is unable to relocate in the local jurisdiction, then the level of sales taxes received by the local governments could be diminished. If, however, these businesses are able to relocate within the jurisdiction, any loss of sales tax revenues would be temporary. Sales tax revenue losses are considered generally insignificant , given the small number of commercial/ retail businesses displaced by acquisitions relative to the overall number of businesses in the city and county.

Business License Fees

Business license fees are generally assessed by individual jurisdictions based on the total number of employees or the annual gross sales receipts of a business. Acquisition of commercial properties could result in lost business license fee revenues. This potential loss is not expected to significantly affect the City of Los Angeles since business license fees represent a very small portion of city revenues.

Federal Funding

A Full Funding Agreement already exists between the federal government and the MTA that specifies that the federal government will pay half of $490 million for the Mid-City Red Line project. If an LPA is not selected, the federal money would leave the region. MTA is also seeking additional federal dollars for the project through ISTEA authorization.

Benefit Assessment Districts

The MTA has the authority under state enabling legislation to establish Benefit Assessment Districts (BADs) for Metro Rail and impose fees for the purpose of capturing a portion of the financial benefits that are expected to accrue to properties surrounding the stations. However, no BADs are being proposed for the Mid-City area by the MTA.

8.2.3 Cumulative Fiscal Impacts

Construction of other public projects planned for the area (the Metro Red Line Western Extension and the Crenshaw-Prairie corridor) could also involve property acquisition that in turn would reduce city and county revenues generated by property and sales taxes. Although effects of other public projects planned for the area have not yet been assessed, they are not expected to be substantial in relation to the existing tax base. The proposed project's effects, when combined with additional effects from other projects, are likely to remain insignificant.

8.2.4 Mitigation Measures

The project would not result in significant fiscal impacts that would require mitigation. New businesses would be a part of the joint development of the excess land at the Pico/ or Venice/San Vicente Station site. New customers would also be able to get to the local businesses via the Red Line.

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[4]/ Funds collected as a result of Propositions A and C are allocated to construct transportation projects. Some of the funds collected throughout Los Angeles County would be spent on the Mid-City Red Line project.

8.2.5 Unavoidable Significant Adverse Fiscal Impacts

Unavoidable significant adverse fiscal impacts would not occur as a result of implementing any of the project alternatives.

9.0 UNAVOIDABLE ADVERSE IMPACTS

Pursuant to §15126, subd.(b) of the State CEQA Guidelines, an EIR must describe significant adverse impacts that cannot be avoided or that remain after the implementation of all feasible mitigation measures. A discussion of unavoidable adverse impacts is also required under NEPA (40 CFR 1502.1). Unavoidable adverse impacts are presented according to the effected resource (or topical issue). In addition, §15126, subd.(b) of the State CEQA Guidelines requires that the reasons for implementing the proposed project despite unavoidable adverse impacts are stated.

9.1 Unavoidable Adverse Impacts by Topical Issue

Transit and Pedestrian Circulation

Implementation of the mitigation measures would reduce or eliminate any transit or pedestrian impacts of the proposed project to a less than significant level.

Traffic

Implementation of the mitigation measures would mitigate the project-related impacts at all the significantly impacted intersections to a less than significant level.

Parking

No unavoidable significant adverse parking impacts would occur during either the construction or operation of the proposed project.

Land Use

Under the No Project Alternative, none of the State, regional, or local transit-related plans, goals, and policies applicable to the proposed project would be implemented. The loss of the land use benefits associated with not implementing the State, regional, or local transit-related plans, goals, and policies is considered a significant adverse impact.

Implementation of the mitigation measures will ensure that any of the potential land use-related impacts associated with the "build" alternatives will be eliminated, or reduced to a less than significant level.

Demographics/Accessibility for Transit/Environmental Justice

Under the No Project Alternative, rail access would not be provided to transit-dependent populations in the project area which would connect people to job opportunities outside of the area and saving them time and money with more efficient transportation service. The loss of this transit benefit is considered a significant adverse impact.

For ~~the four "build"~~ Alternatives A and B no unavoidable significant adverse impacts to transit-dependent, minority, or low-income populations were identified.

The loss of 113 residential units under Alternative C would result in a significant effect to the vacancy rate since it represents a five percent loss in the number of vacant units (113/2,216 = 5%) in the Mid-City area.

Property Acquisition and Displacement

With regard to residential and commercial acquisition and displacement, the four "build" alternatives would not have a significant impact after mitigation. Implementation and adherence to the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 and its amendments would provide equitable treatment, compensation, and relocation assistance to homeowners, renters, businesses, and non-profit organizations displaced by the project.

~~Under Alternatives A and C, the displaced Builder's Discount business may not be able to relocate within the project area due to the scarcity of large vacant properties. Because this business provides unique services to the community, its displacement may remain an unavoidable significant adverse impact if it cannot be relocated within the immediate area. Alternative B does not result in this potential unavoidable adverse impact.~~

The displaced Builder's Discount business may not be able to relocate within the project area due to the scarcity of large vacant properties. Because this business provides unique services to the community, its displacement may remain an unavoidable significant adverse impact if it cannot be relocated within the immediate area.

Alternatives A and C would have to relocate the Eleanor Green Roberts Aquatic Center. If this community swimming pool facility is not relocated within the Mid-City area it will result in an unavoidable significant adverse impact. The MTA is negotiating in good faith with the City of Los Angeles Recreation and Parks Department should the relocation of this community facility become necessary. Alternative B does not result in this potential unavoidable significant adverse impact.

Business Disruption During Construction

After implementation of the mitigation measures, it is possible that unavoidable significant adverse business disruption impacts would still occur during the construction of the Red Line Mid-City Segment. These disruptions are likely to occur at the following locations:

Alternatives A, B1, and B2

On the northwest corner of Olympic Boulevard and Wilton Place the normal business operations of the Korean TV Station ~~and the Buddhist Temple~~ could be affected.

Alternatives A and C

Cut-and-cover construction (during the installation and removal of the concrete street decking) on Pico Boulevard between Victoria Avenue and West Boulevard ~~the Pico/San Vicente Station~~ would affect the normal business operations of the businesses along this commercial strip.

Alternative C

Cut-and-cover construction (during the installation and removal of the concrete street decking) on Crenshaw Boulevard from 8th Street to a point 1,100 feet south of Country Club Drive would affect the normal business operations of the businesses along this commercial strip.

Alternatives A, B1, B2, and C

Construction activities on the construction staging area south of Pico Boulevard between San Vicente and West Boulevards would affect the businesses on the north side of the street along this commercial strip. The potential removal of the TBM from within Wilshire Boulevard immediately west of Western Avenue would also affect the businesses along this commercial strip for approximately two months.

Communities and Community Facilities

After mitigation, the project would not result in significant impacts to the community or community facilities.

Safety and Security

No unavoidable significant adverse safety and security impacts are anticipated.

Aesthetics

No unavoidable significant adverse aesthetic impacts are anticipated.

Noise and Vibration

Implementation of the mitigation measures will reduce all noise and vibration impacts to less than significant levels.

Air Quality/Odor

Air Quality/Odor is separated into the following construction and operation effects.

Construction

Although implementing the mitigation measures described above would reduce air quality impacts of CO, ROC, NO_X, and SO_X, project related emissions would remain an unavoidable significant adverse impact of constructing any of the four "build" alternatives.

Implementation of the mitigation measures described within the document ~~above~~ would reduce PM_{10} impacts to a level less than significant.

Operation

Under the No Project Alternative air quality benefits associated with reduced automobile travel would not be realized. ~~Future emissions levels are expected to decrease relative to existing levels due to mandated improvements in vehicular efficiency.~~ The loss of this benefit is not considered a significant adverse impact.

~~Under Alternatives A and C, potential impacts to sensitive receptors from H_2S odors could be a significant adverse impact of the project.~~

No unavoidable significant adverse air quality impacts would occur as a result of the Mid-City Red Line Extension to Pico/ or Venice/San Vicente for any of the four "build" alternatives analyzed.

Utilities

No unavoidable significant adverse impacts to utilities are anticipated after the implementation of mitigation measures.

Surface Water Quality

No unavoidable significant adverse impacts are anticipated for surface water quality or storm water runoff after the implementation of mitigation measures.

Geology and Subsurface Conditions

Implementation of the mitigation measures will reduce the geology and subsurface effects to a level of less than significant.

Historic Resources

Minimal subsidence may represent an unavoidable adverse impact to historic structures along all of the four "build" alternative alignments. Such subsidence could result in cracks in foundations, walls, etc.. No other unavoidable significant adverse impacts to historical resources are anticipated as a result of the proposed project.

Archaeological Resources

Implementing appropriate mitigation measures would ensure no unavoidable significant adverse archaeological impacts would occur as a result of construction of any of the four "build" alternatives.

Paleontological Resources

Impacts to paleontological resources from tunnel boring could not be mitigated to a less than significant level due to the difficulty of detecting and recovering fossil remains and associated data from the tunnels. Impacts to paleontological resources from tunnel boring and other project related excavations could result in unavoidable significant adverse impacts for Alternatives A, B1, B2, and C.

Section 106 Compliance

The No Project Alternative would not affect any National Register-eligible resources.

If Alternative A were selected, the project would not adversely affect NRHP-eligible historic properties.

If Alternative B were selected, ~~tunneling~~ cut-and-cover construction for the tunnels under the West Boulevard Overcrossing could adversely affect the bridge due to subsidence. In addition, vibration due to subway train operation could also affect the bridge's structural integrity. Although mitigation of these impacts would require careful engineering, successful implementation of such measures is ~~seem~~ feasible.

If Alternative C were selected, tunneling under the Oxford Square Craftsman District could have an adverse effect due to ground subsidence. The probability of successfully mitigating subsidence impacts by implementing preventive measures such as requiring the MTA contractor to use earth pressure balance TBMs and grouting during construction is ~~seems~~ reasonably high.

Energy

No adverse impacts to energy issues are anticipated after the implementation of mitigation measures.

Electric and Magnetic Fields

No unavoidable significant adverse impacts are anticipated.

9.2 Reasons for Implementing the Proposed Project Despite Unavoidable Adverse Impacts

The following reasons are presented for implementing the proposed project despite the resulting unavoidable significant impacts:

- Extending the Red Line from the existing Wilshire/Western Station in a westerly direction to a new interim terminus station near the Venice/Pico/San Vicente Boulevards intersection would implement the beneficial transit goals and policies provided in the General Plan Framework Element, Preliminary Transportation Element, and Regional Comprehensive Plan and Guide, and the MTA's Long Range Transportation Plan.

- Implementing the project would increase passenger convenience and use by providing additional transfer locations between the Red Line and other modes of transportation, including: buses (MTA, Santa Monica, and Culver City bus lines), Metrolink and other trains via Union Station.

- Implementing the project would provide better travel time for transit users to, from, and through the Mid-City area.
  - Travel time savings on highly congested streets.
  - Intercepts several high ridership bus lines and serves residential areas with a high transit dependency population.

- Implementing the project would provide a better terminus station than the Wilshire/Western Station through the inclusion of a park-and-ride facility (the only one in this part of the County) and bus/rail transfer facility.

- The project would implement local and regional air quality and transportation programs by extending a grade separated subway travel mode to the Mid-City area to reduce vehicular traffic congestion and to provide better access to a more efficient transit system.

- The project would contribute to the achievement of air quality goals in a region that is currently a severe non-attainment area for two criteria pollutants.

- The project would achieve consistency with the adopted SCAG Regional Transportation Plan and City of Los Angeles General Plan, and contribute to the effectiveness of the overall transportation program.

- The project would enhance economic development of the station areas, particularly the Pico/Venice/San Vicente Station area.

- The project would increase transit use by creating secure and safe stations, and providing design features at the station that are user friendly.

- The project would improve transit services to a transit-dependent area.

- The project would provide transit-dependent job seekers greater access to regional job opportunities.
- The project would save transit system users time and money through greater efficiency.
- Better utilization of the bus fleet.

10.0 ENVIRONMENTALLY SUPERIOR ALTERNATIVE

In accordance with CEQA Guidelines §15126(d) and NEPA (40 CFR §1502.14(e), this chapter identifies the environmentally superior alternative from among the following five alternatives considered in this document: the No Project Alternative, Alternative A (Wilton/Arlington/Pico Boulevard Approach to Pico/San Vicente Underground Station), Alternative B1 (Wilton/Arlington/Venice Boulevard Approach to Venice/San Vicente Open Air Lower Elevation Station), Alternative B2 (Wilton/Arlington/Venice Boulevard Approach to Venice/San Vicente Higher Elevation Station), and Alternative C (Crenshaw Boulevard/Pico Boulevard Approach to Pico/San Vicente Underground Station).

To identify the environmentally superior alternative this section presents two tables that evaluate 67 separate impacts identified in the main text of this document. These tables are very long and are presented in Appendix L. The first table (Table L-1) identifies each section and topic (e.g., Section 7.1 - Transit and Pedestrian Circulation), and the level of each impact described in the text for the five alternatives considered in this document. These individual impacts are numbered is ascending order. After each impact a conclusion is drawn as to which of the alternatives is environmentally superior as to that particular impact. The second table (Table L-2) identifies each impact by its assigned number in Table L-1, and applies a ranking to each of the identified impacts based on their level of severity or beneficial impact. Impacts are ranked from 1 to 5 with 1 being environmentally superior to 2, and 2 being environmentally superior to 3, and so forth; with 5 being the worst. By totaling the columns, the alternative with the lowest total would be the environmentally superior alternative. In specifying the ranking for each alternative the severity of the impact before and after ~~prior to~~ mitigation was considered.

Based on the conclusions reached in Tables L-1 and L-2, the No Project Alternative is the environmentally superior alternative. Section 15126(d)(4) of the State CEQA Guidelines state that "if the environmentally superior alternative is the 'no project' alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives." Of the three alternatives, Alternative B is the environmentally superior alternative. Alternative A is next, followed by Alternative C as the least environmentally favorable alternative.

Although the No Project Alternative is the environmentally superior alternative because it would avoid certain physical impacts associated with the four "build' alternatives, it would not implement the beneficial aspects of the project. It would not accomplish the MTA's or any other local and regional planning agency's goal of providing rapid transit service to the area, and would not enable a future western extension of the Metro Red Line. It would also not facilitate the improvement of regional air quality associated with reduced automobile use, nor would it provide the desired levels of mobility and accessibility to the transit dependent populations in Mid-City and other areas on the west side of Los Angeles.

Of the "build" alternatives, Alternative B is environmentally superior for the following reasons:

- During construction, Alternative B would have less of an affect on regional traffic than Alternative C. Alternative C would affect traffic along Crenshaw Boulevard between 8th Street and a point 1,100 feet south of Country Club Drive, and it would affect traffic on Olympic Boulevard and Country Club Drive during construction of the cut-and-cover phase of the project. Alternative A is more disruptive to local traffic due to the cut-and-cover to relocate a major storm drain in Queen Anne Place. Alternative B would affect traffic in Arlington Avenue to the same degree as Alternative A, but they would not affect traffic in Olympic Boulevard during construction of the cut-and-cover phase of the project. The effects of cut-and-cover in Pico Boulevard (Alternatives A and C) are much more disruptive to traffic, on-street parking, and access to local streets and businesses than cut-and-cover in Venice Boulevard (Alternative B). Six local streets intersect with Pico Boulevard in the cut-and-cover area; no local streets intersect with Venice Boulevard in the cut-and-cover area.

- Alternative B would require substantially fewer property acquisitions thereby displacing fewer residents and employees than Alternative C. Alternative C requires substantial property acquisitions in order to relocate large storm drains and sanitary sewers. Alternative C would acquire 24 single-family residences, 13 multi-family buildings with 89 units, and 19 commercial buildings housing 25 businesses. Alternative B would acquire 3 single-family residences and demolishing only one, 3 multi-family buildings with 45 units, and 11 commercial buildings housing 20 businesses. Alternative A requires two more commercial property acquisitions than Alternative B. Alternative A requires the acquisition of property on the southeast corner of Pico and West Boulevards to allow for the relocation of the storm drain and the construction of the underground station. Alternatives A and C also would have to relocate the Eleanor Green Roberts Aquatic Center, that would not happen under Alternative B. A graph comparing the property acquisitions and displacement of people by alternative is provided at the end of this section as Table L-3.

- Alternative B would disrupt fewer businesses than either Alternative A or C. Alternatives A and C would disrupt 37 businesses along Pico Boulevard during the cut-and-cover phase of construction and Alternative C would disrupt 79 businesses along Crenshaw Boulevard between 8th Street and a point 1,100 feet south of Country Club Drive during cut-and-cover construction activities. Alternative B would only have a minor effect on businesses at the intersection of Venice and Crenshaw Boulevards.

- Alternatives A and C would require much more cut-and-cover to relocate storm drains and sewer lines than Alternative B. Alternative C would require the relocation of conflicting sanitary sewers and/or storm drains that would involve construction of new sewers and/or storm drains within local streets, as well as several segments between these streets located on private property, including:

  - Ninth Street between 5th Avenue and Crenshaw Boulevard;
  - Victoria Avenue between Ninth Street and Country Club Drive;
  - Bronson Avenue south of Country Club Drive;
  - Crenshaw Boulevard between Country Club Drive and a point 1,100 feet south of Country Club Drive;
  - Pico Boulevard between Windsor Boulevard and Mullen Avenue; and
  - Queen Anne Place between the Queen Anne Recreation Center and Pico Boulevard.

  Alternative A would require the relocation of conflicting sanitary sewers and/or storm drains that would involve construction of new sewers and/or storm drains within local streets, including:

  - Crenshaw Boulevard for a distance 100 feet north and south of Pico Boulevard;
  - Pico Boulevard between Windsor Boulevard and Mullen Avenue; and
  - Queen Anne Place between the Queen Anne Recreation Center and Pico Boulevard.

  Alternative B would require the relocation of conflicting sanitary sewers and/or storm drains that would involve construction of new sewers and/or storm drains within local streets, including:

  - Crenshaw Boulevard for a distance 100 feet north and south of Venice Boulevard; and
  - Venice Boulevard between Victoria Avenue and La Fayette Road.

In addition, Alternative B would cost approximately $100 million less than both Alternatives A and C. This savings could be used by the MTA to fund other transportation improvements that could have a positive impact on environmental issues.

11.0 RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF THE ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

NEPA requires that the environmental effects of the relationship between short-term uses of the environment and the maintenance and enhancement of long-term productivity be discussed in an EIS (40 CFR 1502.16). This discussion will pay special attention to impacts that narrow the range of beneficial uses of existing resources or pose long-term risks to public health and safety. For purposes of this discussion, short-term is defined as the construction and start-up operation associated with the proposed project. Long-term is defined as the full operation of the rail line beginning in the year 2009. As with any major project, the decision to use or transform existing resources will affect the options available to future generations.

No Project Alternative

Implementation of the No Project Alternative would preserve existing resources for future options; however, it would most likely contribute to a long-term worsening of existing traffic and associated air quality problems in the area. The long-term benefit of providing an improved rail transportation system within the Los Angeles basin outweighs the localized short-term adverse impacts that would be created by the project due to the use or transformation of existing resources.

Proposed Project Alternatives[1]

The proposed project would involve the short-term use or transformation of existing resources. Existing residential and commercial properties would be lost to make room for the stations. During construction, existing resources (such as fuel and construction materials) would be used to construct the rail line and stations. In addition, construction activities would result in short-term traffic, noise, and vibration effects. Short-term beneficial impacts include increased employment for construction workers and additional sales for those companies that would supply the materials (see Section 8.1). However, these short-term effects would be outweighed by long-term benefits. The long-term benefits include improved transit service, increased mobility, a reduction in automobile trips in the region, improved air quality, and economic revitalization for the area. These benefits also implement State, regional, and local planning objectives and programs for public transit, regional mobility, vehicle trip reduction, air quality, and economic development as further described in Section 7.4, Land Use. The maintenance of the long-term productivity of the environment would not be adversely affected by the project.

The construction of the proposed project would require the short-term use and commitment of resources which must be weighed against the long-term benefits of operating the transit system. Uses of resources would include:

- Result in the acquisition and transformation of commercial and residential properties for stations;
- Cause the displacement of residents and businesses;
- Generate potentially adverse effects on properties potentially eligible for listing on the National Register; and
- Result in the increased use of electricity.

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[1]/ The information provided in this discussion applies to all alternatives described in this document.

However, the use of these resources would be an expenditure worth the investment when weighed against the benefits of transportation services provided by the system. By improving transit service and efficiency, the Metro Red Line Mid-City Segment would:

- Extend the Red-Line from the existing Wilshire/Western Station in a westerly direction to a new interim terminus station near the Venice/Pico/San Vicente Boulevards intersection.
- Provide convenient transfer locations between the Red Line and other modes of public and private transportation.
- Provide better travel time to, from, and through the Mid-City area.
  - Travel time savings on highly congested streets.
  - Intercepts several high ridership bus lines and serves residential areas with a high transit dependency population.
- Provide a better interim terminus station than the Wilshire/Western Station by providing a park-and-ride facility (the only one in this part of the County).
- Extend a grade separated subway travel mode to the Mid-City area to reduce vehicular traffic congestion and improve air quality by providing better access to a more efficient transit system.
- Contribute to the achievement of air quality goals in a region that is currently a severe non-attainment area for two criteria pollutants.
- Achieve consistency with the adopted regional transportation plan and contribute to the effectiveness of the overall transportation program.
- Potentially enhance the economic development of the Mid-City station areas.
- Create secure and safe stations for patrons.
- Provide design features at the station that are user friendly.
- Provide neighborhood and pedestrian oriented stations.
- Improve transit services to a transit-dependent area.
- Provide transit-dependent job seekers much greater access to regional job opportunities.
- Save transit system users time and money through greater efficiency.

The long-term benefit of providing an improved rail transportation system within the West Los Angeles area outweighs the localized short-term adverse impacts that would be created by the project due to the use or transformation of existing resources.

12.0 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

As required under § 21100.1 of the Public Resources Code and § 15126(f) and 15127 of the State CEQA Guidelines, projects that involve the following: (1) the adoption, amendment, or enactment of a plan, policy, or ordinance; (2) the adoption by a Local Agency Formation Commission (LAFCO) of a resolution making determinations; or (3) any project that will involve an environmental impact statement (EIS) pursuant to the National Environmental Policy Act (NEPA) must include a discussion of any significant irreversible environmental changes that may occur should the project be implemented.

As further referenced in § 15126(f), "uses of nonrenewable resources during the initial and continued phases of the project may be irreversible since a large commitment of such resources makes removal or reuse thereafter unlikely. Primary and secondary impacts generally commit future generations to similar uses. Also, irreversible damage can result from environmental accidents associated with the project." This section describes the irreversible uses of nonrenewal resources, irreversible primary and secondary impacts, irreversible damage from environmental accidents, and irretrievable commitment of resources.

No Project Alternative

The No Project Alternative would not require the irreversible or irretrievable commitment of resources. This alternative would reserve the resources for other development projects or future uses.

Proposed Project Alternatives[1]

The construction of the proposed two-station extension of the Red Line would require the irreversible and irretrievable commitment of resources, including:

- Residential and commercial land resources which would be converted to transit uses.,
- Electricity and petroleum products would be consumed during the construction and operation of project, and
- Construction materials such as: asphalt, cement, steel, lumber, and fabricated metals would be expended.
- Financial resources would be committed for the construction and operation of Metro Rail.

However, the irreversible and irretrievable commitment of resources would be less than significant when compared to the long-term benefits of the project. Benefits of the proposed project include increased accessibility to and from the Regional Core, improved travel times, decreases in vehicle hours of travel, improved transportation connectivity, improved air quality, and reduced traffic on the street system. The need for the proposed project includes severe traffic congestion in the Regional Core, overcrowding of the present bus system, and the need for a more efficient transit system. In addition, a more efficient transit system would save users time and encourage increased transit usage. The proposed project would accelerate the achievement of goals for transportation, air quality, energy conservation, economic development, and commercial growth.

Irreversible environmental damage may occur at the proposed project sites if proper environmental safeguards are not utilized. The proposed project would be engineered, constructed and operated with sophisticated environmental

[1]/ The information provided in this discussion applies to all alternatives described in this document.

protection control systems and safety features to ensure the protection of the environment, employees, and the public's health and safety. The design, construction, and monitoring of these systems must comply ~~would ensure compliance~~ with regulatory requirements and procedures.

13.0 GROWTH-INDUCING IMPACTS

How the Proposed Project Could Foster Growth

Pursuant to § 15126, subd.(g) of the State CEQA Guidelines, an EIR must include a discussion of the growth-inducing impacts of the proposed project as it pertains to the ways in which it could foster economic or population growth or the construction of additional housing, either directly or indirectly, in the surrounding environment. The growth-inducing impacts analysis must also evaluate project actions that would remove obstacles to population growth. Additionally, the analysis must discuss the characteristics of the project that may encourage and facilitate other activities that could significantly affect the environment, either individually or cumulatively. The analysis must not assume that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment. NEPA also requires that growth-inducing impacts be addressed. In NEPA (40 CFR 1508.8), indirect impacts are defined as including "growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems."

SCAG currently estimates that the population within the Mid-City area of the City of Los Angeles could increase by 60,000 people by the year 2020.[1] Regional growth projections for the year 2020 are provided under Section 7.5. "The City of Los Angeles does not have the option of stopping growth and sending it elsewhere. It must prepare for it, should growth occur."[2] Likewise, it is the responsibility of the MTA to be ready and capable to service the transportation demands of the current population and the expected population growth within its service area. Implementation of the proposed project (a two station extension of the Red Line) would not induce growth, but would serve already existing demand and accommodate future area growth.

No Project Alternative

Implementation of the No Project Alternative would result in the regional transportation system continuing to inadequately serve the demand created by the current as well as future population growth in the project area.

Proposed Project Alternatives[3]

Implementation of the proposed project would result in the following responses to regional growth in the area:

- Provision of transit service and other alternative modes of transportation is an important objective in the regional growth management strategy for Los Angeles County. Regional accessibility improvements emphasize moving people, not single-occupant commuter automobiles.

- The City of Los Angeles *Citywide General Plan Framework* (an element of the City's General Plan, December 11, 1996, page 8-1) provides "The transportation system of the future will need to be a fully integrated, multimodal system that offers multiple travel choices to Los Angeles travelers." Transportation improvements enhance the movement of goods resulting in economic growth throughout the region.

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[1]/ Michael Needham, City Planner, City of Los Angeles, Department of City Planning, Community Planning Bureau.

[2]/ The City of Los Angeles *Citywide General Plan Framework* (an element of the City's General Plan, December 11, 1996), page 1.

[3]/ The information provided in this discussion applies to all alternatives described in this document.

- The proposed project would help alleviate the congestion and accessibility constraints imposed by an overcrowded transportation system.
- Indirectly, the proposed project would serve as a catalyst for reinvestment in currently underutilized areas and act as a stimulus to the local economy.
- Result in increased passenger carrying capacity of travel corridors;
- Develop consistency in growth accommodation with local planning policies.
- Result in improved mobility, particularly for transit-dependent users groups.
- Implement the Regional Mobility Plan.

The proposed two-station extension of the Red Line is not growth-inducing, but is instead the MTAs required response to the anticipated population growth forecasted by SCAG.

14.0 PUBLIC INVOLVEMENT PROGRAM

14.1 Components of MTA's Public Involvement Program

For this SEIS/SEIR the Los Angeles County Metropolitan Transportation Authority initiated an extensive community involvement program for the Mid-City project beginning with the Notice of Preparation (NOP) issued in January 1997. The program consisted of a mailing to 4,000 property owners, a large community open house and numerous smaller meetings and follow-up sessions with individual neighborhood and business associations. At the heart of the outreach program was the belief that people should have the opportunity to meet in small groups where they would feel most comfortable expressing their concerns and requesting information. The program was designed to educate and inform as well as listen to and receive comments from a multi-lingual general public, concerned businesses, residents, organizations, and government agencies about the proposed project alternatives.

Frequent communication between MTA and residents/business leaders was maintained through mailings, meetings and tours, meeting announcements, E-mail, and "thank you" notes acknowledging the receipt of individual comments. This will continue throughout.

The objectives of the public involvement program are to:

- inform community members of the proposed transportation project alternatives;
- inform community members about how to have input into the project evaluation and environmental process;
- educate the community about potential impacts, both positive and negative, of the proposed project alternatives;
- obtain maximum public participation;
- create lines of communication that assure maximum public participation and involvement; and
- ensure that community concerns are incorporated into the planning process to the maximum extent possible.

14.1.1 Community Meetings

14.1.1.1 Open House

On January 30, 1997, MTA staff and project consultants held an open house on the proposed project at Pio Pico School between the hours of 7:00 p.m. and 9:30 p.m.. Notice of this open house was provided in the NOP that was circulated two weeks earlier, and ads were printed in the Los Angeles Independent, the Los Angeles Times, the Sentinel, La Opinion, Korea Central Daily, and the Korean Times. The open house was designed to introduce the public and agencies to the revised Metro Red Line Mid-City Segment project. Many residents already were familiar with the Crenshaw alignment (Alternative C) since it was approved in 1992. However, the Wilton/ Arlington/Pico and Venice alignments (Alternatives A and B) were new.

The open house was divided into several "information stations" where large graphic displays of printed information and photos/charts were provided to help educate people about the overall project, the environmental process, urban design issues, construction techniques, and the four alternative routes being considered. The information stations included:

- An overview of the Metro Rail Transit System throughout Los Angeles County;
- Why a Western Extension of the Red Line to Mid-City?
- Why Get Involved?

- Environmental Impact and Review Process;
- Construction Practices;
- Conceptual Urban Designs for Stations;
- The Crenshaw/Prairie Line;
- Registration table where names were recorded for future mailings; and

- A table where people could fill out comment cards

Each of these stations was manned by MTA employees and consultants with specific knowledge of the subject matter being presented. Spanish and Korean-speaking translators as well as English speaking staff welcomed neighbors at the registration table. Throughout the evening, language assistance was provided to anyone who needed it. The guests were invited to move about the room freely, encouraged to ask questions, and discuss their concerns. Comment cards in three languages were provided. Neighbors could fill them out at the open house or take them home to complete and mail in. The comment cards asked neighbors to let MTA know if they wanted a meeting in their neighborhood to further discuss their particular concerns or ask questions. Refreshments were served.

Every person who attended the open house was encouraged to register and thereby be included in future mailings. The registration list was used to thank all those attending for their participation and comments.

14.1.1.2 Community Scoping Meetings

Between January 30, 1997 and the end of June 1997 numerous community scoping meetings and follow-up meetings were held with homeowners associations and other interested public and business groups located in the project area. MTA staff began these meetings with an oral presentation about the project that was supported with large graphs, charts, and aerial photographs. After the verbal presentation, comments from the audience were written down on flip charts and later transcribed for use in the preparation of this document. Both written and verbal comments were received as a result of these meetings. The written comments received at these meetings and the letters mailed to the MTA at a later date are included in Appendix B of this document. Spanish and Korean translators were present when needed. Written comments in Spanish and Korean were also translated for inclusion in this document.

Central to the entire community outreach program were the smaller follow-up meetings with individual neighborhood and business associations. These were initiated by MTA or requested by the homeowner groups. After an initial meeting with several homeowners associations, MTA staff and consultants often returned more than once to continue the dialogue and be sure all questions were answered and comments received.

To give neighbors a first-hand experience of the Metro Red Line system, two tours were conducted by MTA and its consultants. The first took place on Saturday, April 5. Interested public leaders such as the presidents of homeowner associations and others active in the community were invited. The tour began at the Wilshire/Western Station and was designed to display the Red Line, its artwork, safety precautions, and significant details of operation. It included a presentation by a panel of experts who addressed the issues of construction, tunneling, geology, and safety~~ and maintenance~~ of the Metro Red Line.

A second tour conducted on May 6th for the Harvard Heights Homeowners Association was designed to give people the experience of riding on the subway and to introduce all of the security and safety measures that are part of subway operations. More homeowner tours are planned.

The following is a chronology of the community meetings, follow-up meetings, and tours held prior to the issuance of the Notice of Completion. Many additional community meetings will take place prior to the selection of the LPA.

January 22, 1997:	Interagency Scoping Meeting
January 24, 1997:	Korean Central Daily
January 24, 1997:	Korea Times
January 24, 1997:	F.M. Seoul (Radio)
January 30, 1997:	Neighborhood Open House
February 13, 1997:	Mid-City Chamber of Commerce Membership Luncheon
February 13, 1997:	Lafayette Square Association (Board Meeting)
February 19, 1997:	Wilshire Park Association/Wilton School
February 26, 1997:	Country Club Park Homeowners Association Board Windsor Village Community Association
February 27, 1997:	Fremont Place Homeowners Association Board Meeting
March 6, 1997:	West Adams Heritage Association
March 7, 1997	Wilton Place School, Grace Yoon, Principal
March 11, 1997:	Korean Youth & Community Center Staff
March 11, 1997:	Hanmi TV (KATV, Channel 52)
March 19, 1997:	Interagency Task Force Scoping Meeting
March 20, 1997:	Mid-City Chamber of Commerce
March 24, 1997:	Lafayette Square Homeowners Association Board
March 25, 1997:	Korean Rotary Club
March 25 1997:	Community Redevelopment Area PAC
March 27, 1997:	Wilton Place School PTA Meeting
April 1, 1997:	Harvard Heights Homeowners Association
April 5, 1997:	Tour of Metro Red Line with Community Members
April 15, 1997:	English as a Second Language (ESL) Classes/Presentations, Los Angeles High School
April 15, 1997:	Victoria Park Homeowners Association
April 21, 1997:	Wilshire Homeowners Alliance

April 22, 1997:	ESL/Citizenship Classes/Presentations, Pio Pico School
April 23, 1997:	Pio Pico Parents Meeting
April 28, 1997:	Lafayette Square Homeowners Association
May 6, 1997:	Second meeting with Harvard Heights HOA, Red Line tour
May 13, 1997:	Second meeting with Victoria Park HOA
May 27, 1997	Country Club Park Leaders
June 3, 1997:	Second meeting with Country Club Park HOA
June 18, 1997:	Meeting at Pio Pico School for area not represented by a homeowners association (3 languages)
June 24, 1997:	General Community Meeting - Area #3
June 25, 1997:	General Community Meeting - Area #1
July 8, 1997	Country Club park Homeowners Association
July 17, 1997	Wilshire Division police Advisory Board
July 22, 1997	Santa Monica Bus Lines
August 12, 1997	Jim Young, Mid-Town Shopping Center
August 19, 1997	Buddhist Temple, Shung Chae Lee
August 19, 1997	Korean American Chamber of Commerce
August 28, 1997	Wilton School Parent's Meeting
September 13, 1997	Longwood Homeowner's Association
September 21, 1997	Korean Festival

On June 18, 24, and 25, 1997 the public outreach program conducted three public meetings. These meetings were specifically designed to target those residents living in areas within the project boundaries which may not have been represented by a homeowner's association. Over 10,000 flyers in three languages were distributed door-to-door to be sure that as many residents and businesses as possible were reached. Comments were received and recorded.

14.1.1.3 Draft SEIS/SEIR Meeting

On October 7, 1997 a public meeting will be held on the Draft SEIS/SEIR. The purpose of this meeting is to allow the public an opportunity to comment on the Draft SEIS/SEIR and get feedback from MTA staff prior to the closing of the 45-day public comment period. This will be designed to assist the public in a manner that will allow them to prepare their written comments on the Draft SEIS/SEIR.

14.1.2 English, Spanish, Korean Language Approach

From its inception the Mid-City Red Line Public Involvement Program was designed to receive and disseminate information in the three dominant languages of the area: English, Spanish, and Korean. This assured all members of the community an equal opportunity to have their voices heard and to receive information in a form they could understand.

14.1.3 Community Canvassing

In an effort to assure that all residents living near the proposed Mid-City alternative alignments were reached with information about the proposed project, the community outreach staff went door-to-door to adjacent and nearby businesses and homes focusing on areas without homeowners associations. This effort was particularly intense in the Spanish-speaking communities where printed information was presented by Spanish-speaking staff.

14.1.4 (888) Hotline

A hotline (toll free number) was installed and referred to at meetings and in most printed information. The hotline is designed to allow for rapid responses to questions and inquiries by the public about the proposed project. The toll free number is (888) Mid-City or (888) 643-2489.

14.1.5 Community Networking

As the numerous homeowner and business associations and residents are contacted to arrange for meetings focusing upon the Mid-City project, their names, addresses, and phone numbers are entered onto a master list. When community meetings are planned or informational materials are prepared, all the individuals and groups on the list are contacted. The list has been used to inform people about the Open House and separate neighborhood meetings as well as to thank them for participating. Some have also been invited for a tour of the Metro Red Line system and to participate in a brief seminar on subway construction and operational issues.

14.1.6 Community Issue Tracking

As key issues are identified through meetings or conversations with individuals, those concerns are noted and information supplied.

14.2 Agency Coordination/Offices of Elected Officials Consulted

14.2.1 Agency Coordination

An outreach program is being conducted to consult with appropriate local, regional, and state public agencies during preparation of the Mid-City Segment SEIS/SEIR. Two Interagency Meetings were held during the preparation of the Draft SEIS/SEIR to discuss project issues. At the Interagency Meetings, MTA staff made short presentations on various aspects of the proposed project, and comments were taken verbally and in written form. MTA staff also held meetings with State Senator Richard Polanco's office staff, City Council Member Nate Holden's office staff, City Council Member John Ferraro's office staff, and State Senator Diane Watson's office staff.

Following is a chronology of the agency coordination meetings thus far:

January 22, 1997 Interagency Scoping Meeting

February 5, 1997	State Senator Richard Polanco's Office
February 7, 1997	City Council Member Nate Holden's Office
February 12, 1997	City Council Member John Ferraro's Office
February 25, 1997	Assemblymember Kevin Murray's Office
March 6, 1997	State Senator Diane Watson's Office
March 19, 1997	Interagency Scoping Meeting
March 25, 1997	CRA-PAC Meeting
June 24, 1997	Mayor's Office of Economic Development
July 16, 1997	Council Member Nate Holden and Steve Kim
August 13, 1997	Assemblymember Kevin Murray
August 21, 1997	Representative Henry Waxman

14.2.2 Agencies and Offices of Elected Officials Consulted

The following staff members were consulted during the preparation of the Draft SEIS/SEIR:

- State Senator Richard Polanco's Office: Jose Sagala and Bill Mabie
- County Supervisor Yvonne Burke's Office: Mike Bohlke
- City Council Member Nate Holden's Office: Nate Holden and Steve Kim
- City Council Member John Ferraro's Office: Anne Marie Roos
- State Senator Diane Watson's Office: Charles Stewart, Anna Gonzales, and David Wein
- Assemblymember Kevin Murray's Office Kevin Murray and Joey Hill
- Mayor's Office of Economic Development Vanessa Grant
- Representative Henry Waxman's Office Lisa Ellman
- Wilton Place School: Grace Yoon
- LAUSD: Joan Friedman, Bill Piazza, and Sharon Thomas
- LADOT: Robert Takasaki, Rafael Prapeña, and Joe Kennedy
- City of Los Angeles Planning Department: Michael Needham
- City of Los Angeles Dept. of Recreation: Alonzo Carmichael
- Caltrans: Ronald Kosinski
- City of Santa Monica, Transportation Dept.: Joe Stitcher
- City of Inglewood Chief of Staff: Roger Smith

15.0 NOTICE OF PREPARATION

A Notice of Preparation (NOP) was prepared and circulated for the Metro Red Line Mid-City Segment Subsequent Environmental Impact Report with Section 106 and 4(f) Analysis pursuant to Public Resources Code (PRC), § 21080.4; CEQA Guidelines, § 15082, subd. (a). The NOP was sent to all responsible agencies, trustee agencies, and federal agencies involved in approving or funding the project. The NOP was also sent to all persons and groups that notified the MTA in writing or verbally pursuant to PRC, § 21092.2. The NOP was also posted at the office of the county clerk for 30 days pursuant to PRC, § 21092.3.

The NOP was circulated for public review between January 10, 1997 and February 21, 1997. Recipients of the NOP are included in Section 18.0 (Document Recipients), within this SEIS/SEIR. Comments were received during the circulation period from community members, community organizations and governmental agencies. These comments were used to determine the scope of the environmental analysis and alternatives considered within this SEIS/SEIR. The NOP is provided in Appendix A of this document.

A Notice of Intent (NOI) was not circulated pursuant to NEPA since the document is a supplement to a previously approved EIS.

16.0 REFERENCES/BIBLIOGRAPHY

The following documents have been referenced in part or in whole during the preparation of this report.

American National Standards Institute (ANSI). 1983. *Guide for the Evaluation of Human Exposure to Vibration in Buildings*, 3.29-1983.

American Public Transit Association (APTA). 1981. *Guidelines for Design of Rail Transit Facilities.*

Atkinson, Janet I. 1988. *Los Angeles County Historical Directory*. McFarland & Co., Jefferson, NC.

Baist, G. William. 1912. *Real Estate Atlas of Surveys of Los Angeles*. Philadelphia.

Balls, Edward K. 1962. *Early Uses of California Plants*. University of California Press. Berkeley.

Bates, R.L., and Jackson, J.A. 1987. *Glossary of Geology*, Third Edition, American Geological Institute.

Bean, John Lowell, and Charles R. Smith. 1978...Gabrielino. IN: *Handbook of North American Indians*, Vol. 8: California. Smithsonian Institution. Washington, D.C..

Beck, Warren and Ynez D. Hasse. 1974. *Historical Atlas of California*. University of Oklahoma Press. Norman.

Bissell, Ronald M. 1989. "*Cultural Resources Literature Review of Metro Rail Red Line Western Extension Alternatives*." Unpublished report prepared for Michael Brandman Associates. Santa Ana.

California Air Resources Board (CARB). 1984. *California Surface Wind Climatology.*

California Air Resources Board (CARB). 1990. *Motor Vehicle Toxics Control Plan.*

California Department of Conservation, Division of Mines and Geology, *Note 46.*

California Department of Conservation, Division of Mines and Geology. 1986. *State of California Special Studies Zones, Hollywood Quadrangle*: Revised Official Map, dated July 1, Scale 1:24,000.

California Department of Conservation, Division of Mines and Geology. 1994. *Fault-Rupture Hazard Zones in California: Special Publication* 42, 34 pp.

California Department of Conservation, Division of Oil & Gas. 1983. *Regional Wildcat Map Showing Wells Not On Division of Oil & Gas Field Maps*: Map W 1-5, Scale 1":4000'.

California Department of Conservation, Division of Oil & Gas. 1991. *California Oil and Gas Fields*, Volume II - Southern, Central Coastal, and Offshore California: Publication No. TR12, pp. 218-227.

California Department of Conservation, Division of Oil, Gas & Geothermal Resources. 1996, 1995. *Annual Report of the State Oil & Gas Supervisor: Las Cienegas Field Production and Reserves* - 1995, p. 90.

California Department of Conservation, Division of Oil, Gas & Geothermal Resources. 1997, 1996. *Preliminary Report of California Oil and Gas Production Statistics.*

California Department of Transportation. 1984. CALINE4 - *A Dispersion Model for Predicting Air Pollutant Concentrations Near Roadways.*

California Department of Transportation. 1988. *Air Quality Technical Analysis Notes.*

California Department of Water Resources. 1978. *Winds in California.*

California Office of Planning and Research. 1986. *State CEQA Guidelines.*

City of Los Angeles. 1990. *Wilshire Plan* (Community Plan of the General Plan).

City of Los Angeles Planning Department and Los Angeles County Transportation Commission. 1992. *A Discussion Paper for Preparation of a Joint Land Use - Transportation Policy for the City of Los Angeles and the Los Angeles County Transportation Commission, June.*

Converse Consultants West. 1992. *Preliminary Geotechnical Report, Proposed Metro Rail Mid-City Segment, Wilshire/Western Station to Pico/San Vicente Station, Los Angeles Rail Rapid Transit Project*: Conducted for Parsons Brinckerhoff Quade & Douglas, Inc., dated September 14.

Crump, Spencer. 1962. *Ride the Big Red Cars.* Trans-Anglo Books. Costa Mesa.

Curtis, John Obed. 1979. *Moving Historic Buildings.* American Association for State and Local History.

Davis, Donald G., Jr. 1967. *"The Ionaco of Gaylord Wilshire,"* The Southern California Historical Society Quarterly, Volume XLIX, December.

de Wolfe, Evelyn. 1988. "*Country Club Park District Retains Its Serenity, Charm,*" Los Angeles Times, June 19.

Dibblee, T.W., Jr., and Ehrenspeck, H.E. 1991. Geologic Map of the Hollywood and Burbank (South ½) Quadrangles, Los Angeles County, California: Dibblee Geological Foundation Map #DF-30, Scale 1:24,000.

Duke, Donald. 1958. *Pacific Electric Railway.* Pacific Railway Journal. San Marino.

Engineering Management Consultant. 1994. *Metro Red Line - Segment 3, Mid-City Extension Reassessment Study, Final Report*: Prepared for Los Angeles County Metropolitan Transportation Authority, dated July 27, 35 pp. plus 5 appendices.

Engineering Management Consultant. 1996. *Engineering Feasibility Study, Mid-City Extension, Metro Red Line Segment 3, Wilton/Arlington Alignments: Mid-City Extension Reassessment Study, Final Report*: dated August 29, 32 pp. plus 5 appendices.

Engineering-Science, Inc. 1992. *Subsurface Gas Investigation, Metro Rail Red Line Mid-City Segment, Final Report*: Prepared for Parsons Brinckerhoff Quade & Douglas, Inc., dated August.

Envicom Corporation. 1995. *Draft City of Los Angeles General Plan Framework*, January.

Enviro-Rail. 1994. *Alignment Reassessment for Metro Red Line Segment 3 Mid City (R83) and Western Extension (G87), Final Report*: dated June.

Enviro-Rail. 1996a. *Mid-City Alternative Alignment Gas Exploration Study, Final Report: Prepared for Los Angeles County Metropolitan Transportation Authority*, dated March.

Enviro-Rail. 1996b. *Phase II Western Extension Reassessment Study, Final Report: Prepared for Los Angeles County Metropolitan Transportation Authority*, dated March.

Enviro-Rail. 1996c. *Wilton/Arlington Alignment, Engineering Feasibility Study, Subsurface Gas Investigation, Final Report*: Prepared for Los Angeles County Metropolitan Transportation Authority, dated August.

Fogelson, Robert M. 1967. *The Fragmented Metropolis: Los Angeles, 1850-1930.* 1993 reprint, University of California Press, London.

Friis, Leo J. 1983. Campo Aleman: *The First Ten Years of Anaheim.* Friis-Pioneer Press, Santa Ana.

Friis, Leo J. 1937. "*G.L. Crenshaw, Pioneer, Dies*," Los Angeles Times, August 19.

Fuller, W. R., and R. Brown. 1981. *Analysis and Abatement of Highway Construction Noise, United States Environmental Protection Agency*, Report No. 550/9-81-314-A, October.

Gates, J.H., and Mualchin, L. 1995. Los Angeles Area Seismic Hazard Map 1995 Based on Maximum Credible Earthquakes (MCE): California Department of Transportation, Office of Earthquake Engineering, dated December.

Gebhard, David and Robert Winter. 1994. *Los Angeles: An Architectural Guide*. Gibbs-Smith Publishers. Salt Lake City.

Gruen Associates. 1993. *Draft Environmental Impact Report, Los Angeles County Metropolitan Transit Authority (LACMTA) Northern San Gabriel - San Bernardino Valley Rail Transit Corridor*, August.

Hancock, Ralph. 1949. *Fabulous Boulevard*. Funk & Wagnalls, New York.

Harris Miller Miller & Hanson, Inc. 1991. *Draft Guidance Manual for Transit Noise and Vibration Impact Assessment*. Prepared for Federal Transit Administration, United States Department of Transportation, June.

Harris Miller Miller & Hanson, Inc. 1995. *Transit Noise and Vibration Impact Assessment, Final Report*. Prepared for Office of Planning, Federal Transit Administration, United States Department of Transportation, April.

Hauksson, E. 1990. *Earthquakes, Faulting and Stress in the Los Angeles Basin*: Journal of Geophysical Research, v. 95, pp. 15,365-15,394.

Heizer, Robert F. (editor) 1968. *The Indians of Los Angeles County: Hugo Reid's Letters of 1852.* Southwest Museum. Los Angeles.

Heizer, Robert F. (editor). 1978. *Handbook of North American Indians*. Smithsonian Institution, Washington, D. C.

Hummon, C., Schneider, C.L., Yeats, R.S., and Huftile, G.J. 1994. *Active Tectonics of the Northern Los Angeles Basin*: An Analysis of Subsurface Data: Science, dated April.

Hunt, Rockwell D. 1926. *California and Californians*. Lewis, San Francisco.

Institute of Transportation Engineers. 1991. *Trip Generation*, (5th Edition).

Interurbans. 1975. "*Venice Short Lines*." IN: *Interurbans* (Jim Walker, ed.; pp. 26-49). Glendale.

Jennings, C.W. 1994. Fault Activity Map of California and Adjacent Areas: California Department of Conservation, Division of Mines and Geology, California Geologic Data Map Series No. 6, Scale 1:750,000.

Johnston, Bernice E. 1962. *The Gabrielino Indians*. Southwest Museum. Los Angeles.

Jorgensen, Joseph. 1980. *Western Indians*. Freeman & Co., San Francisco.

Juran, I., and Elias, V. 1991. *Ground Anchors and Soil Nails in Retaining Structures*, *in* Fang, H., ed., Foundation Engineering Handbook: Second Edition, Van Nostrand Reinhold (New York), 923 pp.

Kaku Associates, Inc. 1994. *Pico/San Vicente Metro Rail Station Joint Development Assessment Study/Draft Traffic Study*, January.

Klink, Charlene. 1982. "*Rimpau Revisited*," The Historical Observer, Fall.

Kroeber, Alfred L. 1925. *Handbook of the Indians of California. Smithsonian Institution, Bureau of Ethnology* Bulletin 78. Washington, D.C.

Kroeber, A. L. 1953. *Handbook of the Indians of California*. California Book Co., Berkeley.

Lamar, D.L. 1970. *Geology of the Elysian Park-Repetto Hills Area, Los Angeles County, California*: California Division of Mines and Geology Special Report 101, 45 pp. plus 2 plates, Scale 1:24,000.

Law/Crandall, Inc. 1994. *Report of Geotechnical Investigation, Proposed Mid-City Segment, Los Angeles, California (Draft)*: Prepared for the Los Angeles Metropolitan Transportation Authority, dated January.

Leighton and Associates. 1990. *Safety Element, Los Angeles County General Plan*: dated December 6, text plus 8 plates, Scale 1":2 miles.

Lo Buglio, Ann Lawrence Rudecinda. 1971. "*Los Tierras de Oro (The Lands of Gold)*," The Searcher, Volume VIII, Number 3.

Los Angeles Conservancy. Unpublished docents' notes for Country Club Park neighborhood tour.

Los Angeles Conservancy and Lafayette Square Homeowners Association. "*Lafayette Square*," pamphlet to accompany house tour.

Los Angeles County Transportation Commission (LACTC). 1989. *Pasadena - Los Angeles Light Rail Transit Project/Revised Draft Environmental Impact Report*, November.

LACTC. 1992. *Los Angeles Rail Rapid Transit Project-Metro Rail for the Mid-City Segment from Wilshire/ Western to Pico/San Vicente in the City of Los Angeles with Stations at Olympic/Crenshaw and Pico/San Vicente: Final Supplemental Environmental Impact Statement and Final Supplemental Environmental Impact Report.*

Los Angeles County Metropolitan Transportation Authority (LACMTA). 1995. *Metro Rail System Emergency Response Plan/Draft*, June.

Los Angeles Department of Transportation (LADOT). 1993. *Traffic Study Policies and Procedures*, November.

Los Angeles Regional Water Quality Control Board. 1994. *Draft Water Quality Control Plan (Basin Plan).*

Los Angeles Task Force. 1985. *Report on the March 24, 1985 Methane Gas Explosion and Fire in the Fairfax Area, June 10.*

Morton, P.K., Miller, R.V., and Evans, J.R. 1976. *Environmental Geology of Orange County, California*: California Department of Conservation, Division of Mines and Geology Open-File Report 79-8 LA.

Munger Map Book. 1991. California - *Alaska Oil and Gas Fields, Las Cienegas Oil Field, Los Angeles County, California*: Pp. 161-3 and 161-4, Scale 1":1000'.

Mualchin, L., and Jones, A.L. 1992. *Peak Acceleration from Maximum Credible Earthquakes in California*: California Division of Conservation, Division of Mines and Geology.

Myra L. Frank & Associates, Inc. 1996. *Draft Request For Determination of Eligibility and Effects Report for the Metro Rail Red Line Mid-City Extension in the City of Los Angeles, County.* Report on file with the Los Angeles Metropolitan Transportation Authority (MTA).

National Research Council, Transportation Research Board, Washington, D. C. 1980. *Interim Materials on Highway Capacity - Transportation Research Circular No. 212.*

National Research Council, Transportation Research Board, Washington, D. C. 1985. *Highway Capacity Manual, Special Report 209.*

National Register Bulletin 15. 1990. *How to Apply the National Register Criteria for Evaluation of Historic Places.*

Newmark, Maurice H. and R. Marco (editors). 1916. *Sixty Years in Southern California, 1853-1913.* 1984 reprint, Dawson's, Los Angeles.

Newmark, Maurice H. and R. Marco (editors). 1921. "*Part of Old Rancho Is Subdivided*," Los Angeles Times, November 20, V.9.

Quint, Howard H. 1957. "*Gaylord Wilshire and Socialism's First Congressional Campaign*," Pacific Historical Review, November.

Ploessel, M.R., and Slosson, J.E. 1974. *Repeatable High Ground Accelerations from Earthquakes; Important Design Criteria*: California Geology, dated September, pp. 195-199.

Rail Construction Corporation. 1993. Supplemental Permit Application, NPDES Permit No. CA0059714, Metro Red Line Project, Segment 3 West Extension.

Richter, C.F. 1958. *Elementary Seismology*: San Francisco, W.H. Freeman and Company.

Ríos-Bustamante, Antonio and Pedro Castillo. 1986. *An Illustrated History of Mexican Los Angeles: 1871-1985.* University of California Press, Los Angeles.

Rogers, Warren S. 1959. *Mesa to Metropolis: The Crenshaw Area, Los Angeles.* Lorrin L. Morrison, Los Angeles.

San Diego Association of Governments. 1993. *Traffic Generators.*

Santa Monica Bay Restoration Project. 1994. *Public Summary of the Santa Monica Bay Restoration Plan*: dated December.

Savage, Thomas. 1912. "*Six Million Dollar Sale Consummated,*" Los Angeles Times, August 14.

Savage, Thomas. 1955. "*Life of a Rancher.*" *Quarterly Publications of the Historical Society of Southern California.* December.

Seed, H.B., and Idriss, I.M. 1982. *Ground Motions and Soil Liquefaction During Earthquakes, Volume 5 of Engineering Monographs on Earthquake Criteria, Structural Design, and Strong Motion Records*: Berkeley, Earthquake Engineering Research Institute.

Shaw, J.H. 1993. *Earthquake Hazards of Active Blind-Thrust Ramps in the Los Angeles Basin, California*: Princeton University Ph.D thesis, 216 pp.

South Coast Air Quality Management District (SCAQMD). 1988. *Analysis of Ambient Data from Potential Toxics "Hot Spots" in the South Coast Air Basin.*

SCAQMD. 1993. *CEQA Air Quality Handbook.*

SCAQMD. 1994. *Air Quality Management Plan.*

SCAQMD. 1995. *Rules and Regulations.*

SCAQMD. 1881-1995. 1990-1994. *Air Quality Data Summaries.*

SCAQMD and Southern California Association of Governments (SCAG). 1991. *Air Quality Management Plan.*

SCAG. 1992. *Carbon Monoxide Transportation Project Protocol.*

SCAG. 1995. *Regional Comprehensive Plan and Guide.*

Southern California Rapid Transit District (SCRTD). 1983. Milestone 7: *Safety, Fire/Life Safety, Security, and Systems Assurance/Final Report, March.*

SCRTD. 1983. *Final Environmental Impact Report, Los Angeles Rail Rapid Transit Project - Metro Rail, November.*

SCRTD. 1983. *Final Environmental Impact Statement, Los Angeles Rail Rapid Transit Project - Metro Rail, December.*

SCRTD. 1985. *Treatment Plan for Potential Cultural Resources Within Proposed Metro Rail Subway Station Locations in Metropolitan Los Angeles, California*

SCRTD. 1987. *Final Supplemental Environmental Impact Statement/Subsequent Environmental Impact Report (SEIS/SEIR), Los Angeles Rail Rapid Transit Project - Metro Rail, November.*

SCRTD. 1988. *Addendum to the Draft SEIS/SEIR, Los Angeles Rail Rapid Transit Project - Metro Rail, May 20.*

Singer, Clay A. n.d. "*Preliminary Evaluation of Cultural Resources Located along a Series of Proposed Urban Mass Transit System Alignment Alternatives in the City of Los Angeles.*" Unpublished report prepared by Archaeological Resource Management Corp. Garden Grove.

Transportation Research Board. 1994. *Highway Capacity Manual*, Special Report 209.

Transportation Research Board. 1980. *Transportation Research Circular No. 212 - Interim Materials on Highway Capacity.*

Tsutsumi, H., Schneider, C.L., Hummon, C., Yeats, R.S., and Huftile, G.J. 1994. *Surface Structured Tectonic Evolution of the Northern Margin of the Los Angeles Basin, Southern California: Geological Society of America Abstracts with Programs, Cordilleran Section.*

United States Department of the Army Corps of Engineers (USCOE). 1992. *Los Angeles County Drainage Area (LACDA) Feasibility Report/Final.*

United States Department of Agriculture, Soil Conservation Service. 1969. *Report and General Soil Map, Los Angeles County, California*: 70 pp. plus appendices and plate, scale 1:300,000.

United States Department of Transportation, Federal Highway Administration. 1982. "*Procedures for Abatement of Highway Traffic Noise and Construction Noise*," (23 CFR Part 772), Federal-Aid Highway Program Manual 7-7-3, August.

United States Department of Transportation, Federal Transit Administration and Los Angeles County Transportation Commission. 1992. *Final Supplemental Environmental Impact Statement and Final Supplemental Environmental Impact Report, Los Angeles Rail Rapid Transit Project - Metro Rail, The Mid-City Segment from Wilshire/Western to Pico/San Vicente in the City of Los Angeles with Stations At Olympic/Crenshaw and Pico/San Vicente*: dated August.

United States Department of Transportation, Federal Transit Administration and Los Angeles County Transportation Commission. 1992. *Re-Evaluation Report/Draft Supplemental Environmental Impact Report, Los Angeles Rail Rapid Transit Project - Metro Rail for the Mid-City Segment from Wilshire/Western to Pico/San Vicente in the City of Los Angeles with Stations at Olympic/Crenshaw and Pico/San Vicente, January.*

United States Department of Transportation, Urban Mass Transportation Administration (UMTA). 1979. *Guidelines for Preparing Environmental Assessments*, Publication C5620.1.

United States Department of Transportation, UMTA and the SCRTD. 1984. *Environmental Assessment, Los Angeles Rail Transit Project from Union Station to Wilshire/Alvarado (MOS-1), August.*

United States Environmental Protection Agency. 1992. *Guidelines for Modeling Carbon Monoxide from Roadway Intersections.*

United States Environmental Protection Agency. 1993. *Criteria and Procedures for Determining Conformity to State or Federal Implementation Plans of Transportation Plans, Programs, and Projects Funded or Approved Under Title 23 U.S.C. or the Federal Transit Act (40 CFR, Parts 51 and 93).*

United States Environmental Protection Agency, Office of Noise Abatement And Control. 1974. *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*, Report No. 550/9-74-004.

United States Geological Survey. 1981. Hollywood Quadrangle, California: 7.5 Minute Topographic Series: Photorevised from 1966 base, Scale 1:24,000.

Westec, Inc. 1983. "*Archaeological Resources: Los Angeles Rail Rapid Transit Project 'Metro Rail.'*" Unpublished report prepared by Westec Services, Inc. San Diego.

Wilson, John Albert. 1959. (Reproduction of) *Thompson & West's History of Los Angeles County, California*, With Illustrations. Howell-North, Berkeley.

Wright, T.L., Parker, E.S., and Erickson, R.C. 1973. *Stratigraphic Evidence for the Timing and Nature of Late Cenozoic Deformation in the Los Angeles Region*: American Association of Petroleum Geologists Annual Conference, dated May.

Wright, T.L. 1991. *Structural Geology and Tectonic Evolution of the Los Angeles Basin, California, in* Biffle, K.T., ed., Active Margin Basins: American Association of Petroleum Geologists Memoir 52, pp. 35-134.

Yerkes, R.F., McCulloh, T.H., Schoellhamer, J.E., and Vedder, J.G. 1965. *Geology of the Los Angeles Basin, California - An Introduction*: United States Geological Survey Professional Paper 420-A, 57 pp.

Ziony, J.I., and Yerkes, R.F. 1985. *Evaluating Earthquake and Surface-Faulting Potential, in Ziony, J.I., ed., Evaluating Earthquake Hazards in the Los Angeles Region, An Earth-Science Perspective*: United States Geological Survey Professional Paper 1360, 505 pp.

17.0 DOCUMENT PREPARERS

Metropolitan Transportation Authority

Carol Inge	Director, Westside Area Team
Kevin Michel	Project Manager, Westside Area Team
Ellen Gelbard	Project Manager, Westside Area Team
Jim Sowell	Manager, Environmental Compliance
Leann Taagepera	Environmental Specialist, Environmental Compliance
James Givens	Deputy Project Manager, Engineering, Construction Division
Roger Dames	Deputy Project Manager, Construction, Construction Division
Hitesh Patel	Engineering Project Manager, Construction Division
Haim Geffen	Scheduling Operations Planner
Rick Del Carlo	Project Manager, Joint Development
Rich Mora	Cost Estimating, Construction Division

Federal Transit Administration

Robert Hom	
Ray Sukys	General Engineer
Joe Ossi	Environmental Planner
Terry Esteb	Senior Consultant, Hill International, Inc. (Under contract with the FTA)

Ultrasystems Environmental Incorporated

Project Management, Document Preparers, Related Projects, Land Use, Communities and Community Facilities, Safety and Security, Aesthetics, Utilities, Paleontological Resources, Energy, Electric and Magnetic Fields

Gene Anderson	Project Director
Don McClean	Associate Planner
John Arnau	Associate Planner
Margaret Shekell	Associate Planner

HNTB

Operational Characteristics, Construction Methods, Urban Design, Public Involvement Program

Edward McSpedon	Vice President
Fred Glick	Director
Barbara Simpson	Project Manager
Andres Garcia	Project Manager

Kimley-Horn and Associates, Inc.

Transit and Pedestrian Circulation, Traffic, Parking

Serine Ciandella	Senior Traffic Engineer

Ninyo & Moore

Surface Water Quality, Geology and Subsurface Conditions

Rick Hazen	Senior Project Geologist
Craig Metheny	Senior Project Environmental Geologist

Giroux & Associates

Air Quality/Odor, Noise and Vibration

Hans Giroux	Senior Scientist

Archaeological Associates

Historic Resources, Archaeological Resources, Section 106 Compliance, Section 4(f) Evaluation

Robert White	Archaeologist
Lori White	Historian
David Van Horn	Archaeologist

Lee Andrews Group

Demographics/Accessibility for Transit/Environmental Justice, Property Acquisition and Displacement, Business Disruption During Construction, Economic and Fiscal Impacts, Public Involvement Program

Donna Andrews	President
Ella Neely	Vice-President
Phil Martin	Demographics, Economics

Hintz & Balvin Communications

Public Involvement Program

Christle Balvin	President
Jennifer Hintz	Associate

Padilla & Associates

Public Involvement Program (Latino Community)

Katherine Padilla	Principal

Korean American Coalition

Public Involvement Program (Korean Community)

Charles Kim	Executive Director
John Yoo	Politics/Law Specialist